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TECHNICAL PROGRAM

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

Technical Meeting and Exhibition

MS & T 18

MATERIALS SCIENCE & TECHNOLOGY

OCTOBER 14 – 18, 2018 | GREATER COLUMBUS CONVENTION CENTER | COLUMBUS, OHIO, USA

Organizers:

The American Ceramic Society
www.ceramics.org



Metallurgy & Materials Society



The Minerals, Metals & Materials Society

Sponsored by:





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PROGRAM AT-A-GLANCE

PROGRAM HIGHLIGHTS

MS&T18 Plenary Session	TUE	AM	Union Station B	55
MS&T18 Poster Session	TUE	AM & PM	Hall A	128
ACerS Basic Science Division Robert B. Sosman Lecture	WED	PM	A111/112	99
ACerS Frontiers of Science and Society - Rustum Roy Lecture	TUE	PM	A111/112	56
ACerS GOMD Alfred R. Cooper Award Session	TUE	PM	A115	63
ACerS Richard M. Fulrath Award Symposium	MON	PM	A111/112	35
ACerS/EPDC: Arthur L. Friedberg Ceramic Engineering Tutorial and Lecture	MON	AM	A111/112	15
Alpha Sigma Mu Lecture	MON	PM	C170	42
ASM Edward DeMille Campbell Memorial Lecture	TUE	PM	C170	61
ASM-IMS Henry Clifton Sorby Lecture	TUE	PM	A212	64

ADDITIVE MANUFACTURING

Additive Manufacturing of Composites and Complex Materials III

Metals Additive Manufacturing	MON	AM	A222	15
Additive Manufacturing of Metallic Composites	MON	PM	A222	36
Ceramic Additive Manufacturing	TUE	PM	A222	56
Techniques and Applications	WED	AM	A222	75
Polymer Additive Manufacturing	WED	PM	A222	99

Additive Manufacturing of Metals: Microstructure and Material Properties

AM Process Parameter - Effects	MON	AM	A215	16
AM Stainless Steels - Microstructure and Properties	MON	PM	A215	36
Properties of AM Components	MON	PM	A214	37
Biomedical and Functional AM Materials	TUE	PM	A214	57
Characterization Methods for AM	TUE	PM	A215	57
AM Superalloys - Microstructure and Properties	WED	AM	A214	75
Microstructure Control in AM Components	WED	AM	A215	76
Microstructure and Properties of AM Ti-64 Alloy	WED	PM	A214	99
Modeling and Alloy Development for AM	WED	PM	A215	100
Jet Binder and Wire-based AM Processes	THU	AM	A214	118
Performance of AM Materials	THU	AM	A215	118



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Additive Manufacturing of Metals: Post Processing

Heat Treatment I	TUE	PM	A216	56
Heat Treatment II	WED	AM	A216	76
Surface Post Processing I/ Heat Treatment III	WED	PM	A216	100
Post Processing	THU	AM	A216	119

Additive Manufacturing: In-situ Process Monitoring and Control

Session I	MON	AM	A221	16
Session II	MON	PM	A221	37
Session III	TUE	PM	A221	58

Additive Manufacturing: Modeling and Simulation of AM Materials, Processes, and Mechanics

AM Modeling - Session I	MON	AM	A223	17
AM Modeling - Session II	MON	PM	A223	37
AM Modeling - Session III	TUE	PM	A223	58
AM Modeling - Session IV	WED	AM	A223	77

Additive Manufacturing: Powder Characterization and Recycling

Powder Characterization	MON	AM	A224	17
Role of Powder Characteristics on Additive Manufacturability	MON	PM	A224	38
Recyclability of Powders and Characterization	TUE	PM	A224	59

Multi-scale Simulation and Experimental Validation of Additive Manufacturing Technologies: A Status Update by Academia, Solution Providers and Industry on Its Intake, Market Opportunities Now and Going Forward

Multiscale Simulation in Additive Manufacturing and 3DSIM-ANSYS AM Capabilities Demonstration	WED	AM	A221	92
Multiscale Simulation in Additive Manufacturing and AM Panel Discussion	WED	PM	A221	113

BIOMATERIALS

Next Generation Biomaterials

Biomaterials I	MON	AM	D182	30
Biomaterials II	MON	PM	D182	50
Biomaterials III	TUE	PM	D182	69
Biomaterials IV	WED	AM	D182	93
Biomaterials V	WED	PM	D182	114
Biomaterial VI	THU	AM	D182	125

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Surface Properties of Biomaterials

Biomedical Device Surface Properties and Biological Interactions	MON	AM	D281	33
Biomedical Devices for Tissue Engineering and Regenerative Medicine	MON	PM	D281	54

CERAMIC AND GLASS MATERIALS

ACerS Robert B. Sosman Award Symposium: Lead-free Piezoceramics: From Local Structure to Application

Session I	WED	AM	A111/112	75
Session II	WED	PM	A111/112	99

Ceramic and Crystal Materials for Optics and Photonics

Session I	MON	AM	A113	21
Session II	MON	PM	A113	42
Session III	TUE	PM	A113	61

Ceramics and Glasses Simulations and Informatics

Machine Learning and Materials Design	WED	AM	A113	80
Multiscale Modeling of Materials	WED	PM	A113	104
Atomistic Simulations	THU	AM	A113	121

Eco-Friendly and Sustainable Ceramics

Innovative Binders and Cement Blends	WED	AM	A114	84
Novel Waste-derived Cellular Materials	WED	PM	A114	106
Innovative Sustainable Building Materials	THU	AM	A114	123

Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology

Chemical and Transport Processes in Glasses	MON	AM	A115	23
Mechanical Properties of Glasses	MON	PM	A115	45
ACerS GOMD Alfred R. Cooper Award Session	TUE	PM	A115	63
Optical, Photonic, and Electronic Properties of Glasses/Glass Structure	WED	AM	A115	84
Glass Formation, Relaxation, and Crystallization	WED	PM	A115	107

Innovative Processing and Synthesis of Ceramics, Glasses and Composites

Processing I	MON	AM	A120	24
Processing II	MON	PM	A120	46

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International Symposium on Ceramic Matrix Composites

Processing and Microstructure Evolution	MON	AM	A114	25
Testing and Damage Characterization	MON	PM	A114	47
Damage Evaluation and Modeling	TUE	PM	A114	64

Materials Science and Engineering of Earth Abundant Materials

Materials Science and Engineering of Earth Abundant Materials	MON	AM	A124	28
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Modern Ceramic Manufacturing Methods and Applications

Modern Ceramic Manufacturing Methods and Applications	TUE	PM	A120	68
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New Advances and Innovations in Corrosion of Refractory Ceramics

International Symposium on New Advances and Innovation in Corrosion of Refractory Ceramics I	WED	AM	A120	92
International Symposium on New Advances and Innovation in Corrosion of Refractory Ceramics II	WED	PM	A120	114

Phase Transformations in Ceramics: Science and Applications

Phase Transformations in Ceramics: Science and Applications - Crystallography	WED	AM	A124	93
Phase Transformations in Ceramics: Science and Applications - Processing-Microstructure-Properties I	WED	PM	A124	115
Phase Transformations in Ceramics: Science and Applications - Processing-Microstructure-Properties II/Theory	THU	AM	A124	126

ELECTRONIC AND MAGNETIC MATERIALS

Advances in Dielectric Materials and Electronic Devices

Dielectrics and Magnetoelectrics I	MON	AM	B132	19
Dielectrics and Magnetoelectrics II	MON	PM	B132	41
Advanced Dielectrics and Energy	TUE	PM	B132	60

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

Session I	MON	AM	B140/141	18
Session II	MON	PM	B140/141	40
Session III	TUE	PM	B230	59

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

Semiconductor Heterostructures I	WED	AM	B132	95
Semiconductor Heterostructures II	WED	PM	B132	116

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ENERGY

Advances in Solid Oxide Fuel Cell Technology

SOFCs for Stationary Applications	TUE	PM	D281	60
SOFC Durability	WED	AM	D281	78
SOFCs for Military Applications	WED	PM	D281	102
SOFC Research and Development	THU	AM	D281	121

Covetic Nanomaterials for Energy Applications

Covetic Materials I	WED	AM	D282	83
Covetic Materials II	WED	PM	D282	105

Materials for Nuclear Applications and Extreme Environments

Metallic Alloys for Nuclear Systems	MON	AM	D183	27
Radiation Effects on Materials' Structure and Properties	MON	PM	D183	49
Theory and Modeling of Nuclear Materials	TUE	PM	D183	67
Processing and Behavior of Novel Fuels I	WED	AM	D183	89
Processing and Behavior of Novel Fuels II	WED	PM	D183	111

Materials Issues in Nuclear Waste Management

Nuclear Waste Form Processing and Synthesis I	MON	AM	D282	27
Nuclear Waste Form Processing and Synthesis II	MON	PM	D282	49
Corrosion Science in Nuclear Waste Management	TUE	PM	D282	67

FAILURE ANALYSIS

Characterization & Methods in Failure Analysis

Tools & Techniques I	MON	AM	A211	21
Tools & Techniques II	MON	PM	A211	42
Fatigue & Fracture I	TUE	PM	A211	62
Fatigue & Fracture II	WED	AM	A211	81
Corrosion	WED	PM	A211	104
FAS-IMS Failure Analysis Applications of Microanalysis, Microscopy, Metallography & Fractography	THU	AM	A211	122

Manufacturing-Related Failures

Welding/Joining Failures	TUE	PM	A210	66
Casting Failures	WED	AM	A210	88
Medical Device Failures	WED	PM	A210	110

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User-Related Failures

Non-Metallic Failures I	MON	AM	A210	34
Transportation	MON	PM	A210	55

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FUNDAMENTALS AND CHARACTERIZATION

Bulk Metallic Glass Matrix Composites—Challenges and Triumphs

Alloy Design and Theoretical Modeling	WED	AM	B244/245	80
Mechanical Properties and Structure-property Relation	WED	PM	B244/245	103

Deformation and Transitions at Grain Boundaries VI

Grain Boundary Energy and Structure I	TUE	PM	A123	63
Dislocation-Grain Boundary interactions	WED	AM	A123	83
Grain Boundary Energy and Structure II	WED	PM	A123	105
Gradients near Grain Boundaries	THU	AM	A123	122

Fast/Ultrafast Characterization of Irreversible Transformations in Materials with X-rays and Electrons

Synchrotron X-ray and XFEL Imaging	WED	PM	B246	107
Fast TEM Imaging - Phase Transformation and Beyond	THU	AM	B246	123

IMS Symposium on Metallography and Microstructural Characterization of Metals and the Correlation of Microstructure to Mechanical Properties

Metallographic Preparation Techniques of Materials	MON	AM	A212	23
Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties I	MON	PM	A212	45
Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties II	TUE	PM	A212	64
Optical and Electronic Characterization at Microstructures	WED	AM	A212	85
Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties III	WED	PM	A212	108

Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches

Polycrystal Interfaces	MON	AM	A122	24
Structure & Chemistry	MON	PM	A122	46
Surface Properties	TUE	PM	A122	64
Kinetics	WED	AM	A122	85
Thermodynamics	WED	PM	A122	108
Interfaces	THU	AM	A122	124

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International Symposium on Defects, Transport and Related Phenomena

Defect Formation and Properties	MON	AM	B242/243	25
Defect and Novel Devices	MON	PM	B242/243	47
Gas-Solid Interface Transport	TUE	PM	B242/243	65
Bulk and Grain Boundary Transport	WED	AM	B242/243	86

Materials Property Understanding through Characterization

Novel Characterization Techniques	MON	AM	B240/241	28
Metals I	MON	PM	B240/241	50
Novel Non-Metallic Materials	TUE	PM	B240/241	67
Metals II	WED	AM	B240/241	90

Multifunctional Ceramic- and Metal-matrix Composites: Processing, Microstructure, Properties and Performance

Novel Composite Materials	MON	AM	A123	28
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Neutron and Synchrotron Techniques for Advanced Materials Characterization

Advanced Neutron & Synchrotron Techniques	MON	AM	B246	29
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PSDK XIII: Phase Stability and Diffusion Kinetics 2018

Gibbs Award Session I	MON	AM	A213	31
Gibbs Award Session II/Modeling of Properties	MON	PM	A213	51
Thermodynamics: modeling and Experiments	TUE	PM	A213	70
Computational Tools and Diffusion	WED	AM	A213	94
Manufacturing and Phase Transformation	WED	PM	A213	115

Small-scale Properties of Materials and Length-scale Phenomena

Size Effect	MON	AM	A121	33
In-situ Assessments	MON	PM	A121	53
Structure I	TUE	PM	A121	71
Stress/Strain Behavior	WED	AM	A121	96
Mechanical Testing	WED	PM	A121	116
Structure II	THU	AM	A121	126

Symposium on Large Fluctuations and Collective Phenomena in Materials VI

Mean Field Theory and Other Theoretical Models	MON	PM	B235	54
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Synergy in Multi-scale Modeling and Experiments to Resolve Complex Disordered Solids

Session I: Multi-scale Modeling-driven Synergy	TUE	PM	B246	73
Session II: Experimentally-driven Synergy	WED	AM	B246	97



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IRON AND STEEL (FERROUS ALLOYS)

Advances in Zinc-coated Sheet Steel Processing and Properties

Advances in Zinc-coated Sheet Steel Processing and Properties I	MON	AM	A225	20
Advances in Zinc-coated Sheet Steel Processing and Properties II	MON	PM	A225	41

Advanced Steel Metallurgy: Products and Processing

General Steel Session I	MON	AM	A226	19
Lightweight Steels	MON	PM	A226	40
Iron and Steelmaking, Processing, and Cleanliness	TUE	PM	A226	60
Stainless and High Alloy Steels and Cast Iron	WED	AM	A226	78
Dual Phase and Q&P Steels	WED	PM	A226	101
General Steel Session II	THU	AM	A226	120
General Steel Session III	THU	AM	A223	120

Microalloyed Steels

Microalloyed Steels I	TUE	PM	A225	68
Microalloyed Steels II	WED	AM	A225	90
Microalloyed Steels III	WED	PM	A225	112

MATERIALS-ENVIRONMENT INTERACTIONS

Advanced Coatings for Wear and Corrosion Protection

Advanced Coatings for Wear and Corrosion Protection I	MON	AM	C160A/160B	18
Advanced Coatings for Wear and Corrosion Protection II	MON	PM	C160A/160B	38

Advanced Materials for Harsh Environments

Advanced Materials and Sensors for Harsh Environments I	MON	AM	C161A/161B	18
Advanced Materials and Sensors for Harsh Environments II	MON	PM	C161A/161B	39

Advanced Materials for Oil and Gas Applications -Performance and Degradation

Advanced Materials for Oil and Gas Applications - Performance and Degradation	WED	PM	B140/141	101
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Catalyst Support Materials and Support Effect

Catalyst Support Materials and Support Effect	MON	AM	C170	20
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Corrosion of Additively Manufactured Metals

Corrosion of Additively Manufactured Metals	WED	AM	A220	82
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Environmental Degradation and Embrittlement of Structural Metals

Stress Corrosion Cracking I	MON	AM	C162A/162B	23
Stress Corrosion Cracking II	MON	PM	C162A/162B	44
Hydrogen Embrittlement I	TUE	PM	C162A/162B	63
Hydrogen Embrittlement II	WED	PM	C161A/161B	106

Materials Degradation in CO2 Environments

Session I	WED	AM	C162A/162B	89
Session II	WED	PM	C162A/162B	111

Selection of Materials for Application in Corrosive Environments

Materials Selection Symposium - Session I	MON	AM	A220	32
Materials Selection Symposium - Session II	MON	PM	A220	52
Materials Selection Symposium - Session III	TUE	PM	A220	71

Thermal Protection Materials and Systems

TPS Design and Materials Characterizations	WED	AM	C161A/161B	98
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NANOMATERIALS

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

Session I	MON	PM	D180	43
Session II	TUE	PM	D180	62
Session III	WED	AM	D180	82
Session IV	WED	PM	D180	105

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

Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry - Session I	TUE	PM	C161A/161B	68
Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry - Session II	WED	AM	D181	92
Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry - Session III	WED	PM	D181	113
Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry - Session IV	THU	AM	D181	125

Responsive Functional Nanomaterials

Multi-functional Nanosensors	MON	AM	D181	32
Responsive Smart Nanomaterials	MON	PM	D181	52
Functional Nanomaterials for Energy and Sensing	TUE	PM	D181	70

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PROCESSING AND PRODUCT MANUFACTURING

10th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing

Session I	MON	AM	B233	15
Session II	MON	PM	B233	35
Session III	TUE	PM	B233	56
Session IV	WED	AM	B233	74

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

Advanced Manufacturing I	MON	PM	B230	39
Shape Memory Alloys	WED	AM	B230	77
Advanced Functional Materials	WED	PM	B230	101
Advanced Manufacturing II	THU	AM	B230	119

Advances in Surface Engineering

Carburization/Nitridation/Boronization and Engineering of Surface Geometry/Structure/Roughness	WED	AM	B144/145	79
Tribology/Tribocorrosion, Surface Stresses, and Surface Microstructure	WED	PM	B144/145	102
Functional Coatings/Films/Surface Features	THU	AM	B144/145	121

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

2D Boron & Clusters	MON	AM	B244/245	20
Novel Synthesis & Boron Suboxide	MON	PM	B244/245	42
Physical Properties of Bulk Systems	TUE	PM	B244/245	61

Composition-Processing-Microstructure-Property Relationships of Titanium Alloys

Heat Treatment & Processing, Powder Metallurgy	MON	AM	C150	22
Deformation and Transformations	MON	PM	C150	43
Phase Transitions & Alloy Design	TUE	PM	C150	62
Deformation, Fatigue, & Fracture	WED	AM	C150	81



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Joining of Advanced and Specialty Materials (JASM XX)

Plenary: 20 Years of JASM	MON	AM	C171	26
Brazing of Advanced Materials	MON	PM	C172	47
Friction Stir and Friction Welding I	MON	PM	C171	48
Friction Stir and Friction Welding II/Other Solid State Joining Processes	TUE	PM	C171	65
Welding Metallurgy I	TUE	PM	C172	66
Nano- and Micro-Joining	WED	AM	C171	86
Welding Processes	WED	AM	C172	87
Ultrasonic Joining	WED	PM	C171	109
Welding Metallurgy II	WED	PM	C172	109
Dissimilar Materials Joining	THU	AM	C171	124

Light Metal Technology—Applications for the Transportation Industry

Aluminium Alloys Casting I	MON	AM	B130	26
Titanium/Aluminum Alloys Development	MON	PM	B130	48
High Strength Aluminium Alloys	TUE	PM	B130	66
Modeling and Formability/Magnesium Alloys	WED	AM	B130	88
Aluminium Alloys Casting II	WED	PM	B130	110

Light Metals—Applications and Fitness-for-Service Characterization

Light Metals – Applications and Fitness-for-Service Characterization	MON	AM	B230	26
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Mechanochemical Synthesis and Reactions in Materials Science III

Session I	WED	AM	B131	90
Session II	WED	PM	B131	111

Multi Scale Modeling of Microstructure Deformation in Material Processing

Multiscale Modeling of Microstructure Deformation in Material Processing - Part I	WED	AM	C170	91
Multiscale Modeling of Microstructure Deformation in Material Processing - Part II	WED	PM	C170	112

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

Session I	MON	AM	A125	30
Session II	MON	PM	A125	51
Session III	TUE	PM	A125	69

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Rare Earth Metals and Critical Materials: Synthesis, Processing, Production, Recent Advances

Rare Earth Metals - Mining and Extraction	MON	AM	B131	31
Rare Earth Magnets and Critical Materials	MON	PM	B131	52
Rare Earth Metals for Medical and Light Weight Structural Applications	TUE	PM	B131	70
Critical Materials Resources and Regulatory Issues	WED	AM	A224	94

Sintering and Related Powder Processing Science and Technologies

Sintering and Microstructural Evolution	MON	AM	B142/143	33
Miscellaneous Sintering Topics	MON	PM	B142/143	53
Field Assisted Sintering I: Fundamentals	TUE	PM	B142/143	71
Field Assisted Sintering II: Applications	WED	AM	B142/143	95

Solid State Processing

Friction Stir Processing and Other Torsion Processing Techniques	TUE	PM	B140/141	72
Solid State Processing	WED	AM	B140/141	96

Surface Protection and Spray Technology for Enhanced Materials Performance: Science, Technology, and Application

Cold Spray Coatings	TUE	PM	B234	73
Environmental and Thermal Barrier Coatings	WED	AM	B234	97
Aerosol, Sputtering, and Functional Coatings	WED	PM	B234	117

Synthesis, Characterization, Modeling, Properties and Applications of Functional Porous Materials

Porous Materials I	MON	AM	B144/145	34
Porous Materials II	MON	PM	B144/145	55
Porous Materials III	TUE	PM	B144/145	73

Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications

High Performance Additively Manufactured Alloys	TUE	PM	B235	74
High Entropy Alloys	WED	AM	B235	98
Ultrafine Grained / Nanostructured / Composites / Hybrids	WED	PM	B235	117
High Temperature and other High Performance Alloys	THU	AM	B235	127

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SPECIAL TOPICS

Art and Cultural Heritage: Reverse Engineering

Art and Cultural Heritage: Reverse Engineering I	WED	AM	B232	79
Art and Cultural Heritage: Reverse Engineering II	WED	PM	B232	103

Careers in Industry

Networking and Careers for Material Scientists	TUE	PM	B231	61
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Curricular Innovations and Continuous Improvement of Academic Programs (and Satisfying ABET along the Way): The Elizabeth Judson Memorial Symposium

ABET and Accreditation	MON	AM	B232	22
The Classroom Laboratory	MON	PM	B232	44

From Diversity to Inclusion

Session I	WED	AM	B231	84
Session II	WED	PM	B231	107

Journal of the American Ceramic Society Awards Symposium

JACerS Awards Symposium Session I	WED	AM	A125	87
JACerS Awards Symposium Session II	WED	PM	A125	110

Perspectives for Emerging Materials Professionals

Session I	MON	AM	B231	30
Session II	MON	PM	B231	50

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

Special Session on Innovation by Entrepreneurs, Startups, and Small Businesses	TUE	PM	B232	72
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10th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Session I

Program Organizers: Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technology; Surojit Gupta, University of North Dakota; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin-Stout; Allen Applett, Oklahoma State University; Richard Sisson, Worcester Polytechnic Institute; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Mritunjay Singh, Ohio Aerospace Institute

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

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

8:00 AM Invited

Challenges in High Temperature Electrochemical Systems: *Manoj Mahapatra*¹;
¹University of Alabama at Birmingham

8:20 AM Invited

A Suspension-enclosing Projection-stereolithography Process for Complex Ceramic Component Fabrication without Building Support Structures: *Xuan Song*¹; Li He¹; ¹University of Iowa

8:40 AM Invited

Hybrid Thermoplastic Composites of Natural Fiber and Recycled Carbon Fiber: Joseph Fehrenbach¹; Niyati Shah¹; *Chad Ulven*¹; ¹North Dakota State University

9:00 AM

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

9:20 AM

Tannic Acid: A Sustainable Crosslinking Agent for High Glass Transition Epoxy Thermosets: *Matthew Korey*¹; John Howarter¹; ¹Purdue University

9:40 AM Invited

Flash Sintering as an Energy and Cost Saving Sintering Technology: A Case Study of ZnO: *Jian Luo*¹; ¹University of California San Diego

10:00 AM Break

10:20 AM Invited

Flexibly-embedding Microchannels in Ceramics Using an Integrated Additive Manufacturing and Laser Machining Method: *Fei Peng*¹; Yuzhe Hong¹; Hai Xiao¹; Jianhua Tong¹; Rajendra Bordia¹; ¹Clemson University

10:40 AM Invited

GPSed Reaction Bonded Silicon Nitride with High Thermal Conductivity for Power Module Substrate Applications: *Jae-Woong Ko*¹; Ha-Neul Kim¹; Jin-Myung Kim¹; Young-Jo Park¹; Hai-Doo Kim¹; ¹Korea Institute of Materials Science

11:00 AM

Materials Innovations to Support Next Generation Manufacturing: *Glenn Daehn*¹; George Spanos²; ¹The Ohio State University; ²The Minerals, Metals & Materials Society

11:20 AM

Investigating the Potential of Bismuth as Replacement for “Toxic” Lead: *Joseph Hamuyuni*¹; Fiseha Tesfaye²; Daniel Lindberg²; ¹Aalto University; ²Åbo Akademi University

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

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

Session Chair: Kristen Brosnan, GE Global Research

9:00 AM Invited

Digital Assembly of Colloidal Suspensions, Gels and Foams: *Jennifer Lewis*¹;
¹Harvard University

Additive Manufacturing of Composites and Complex Materials III — Metals Additive Manufacturing

Program Organizers: Dirk Lehmhus, Fraunhofer - Ifam; Jonathan Spowart, Air Force Research Laboratory; Nikhil Gupta, New York University; Eric Jaegle, Max-Planck-Institut Fuer Eisenforschung

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

Session Chair: To Be Announced

8:00 AM Introductory Comments

8:10 AM

Horizontal and Vertical Grading of Ti-Ta in Laser Powder Bed Fusion Additive Manufacturing: *Joe Walker*¹; Matt Larson²; John Middendorf²; Joy Gockel¹;
¹WSU; ²Universal Technology Corporation

8:30 AM Invited

Hybrid Additive Manufacturing of Gamma Titanium Aluminide Space Hardware: André Seidel¹; *Elena Lopéz*²; Shuvra Saha²; Tim Maiwald²; Juliane Moritz²; Stefan Polenz²; Axel Marquardt¹; Joerg Kaspar²; Thomas Finaske²; Mirko Riede²; Frank Brueckner²; Christoph Leyens¹; ¹Technical Univ Dresden & Fraunhofer IWS; ²Fraunhofer IWS

8:50 AM

Improving the Manufacturability of Tungsten Produced via LPBF Through in Situ alloying with Tantalum: *Amanda Field*¹; Luke Carter¹; Nicholas Adkins¹; Martin Strangwood¹; Moataz Attallah¹; Mike Gorley²; ¹University of Birmingham; ²UK Atomic Energy Authority

9:10 AM Invited

Manufacturing of Functionally Graded Parts Using 3D Plasma Metal Deposition: *Peter Mayr*¹; Kevin Hofer¹; ¹Chemnitz University of Technology

9:30 AM

Tailoring the Coefficient of Thermal Expansion in Additively Manufactured Functional Materials through Compositional Grading: *Skyler Hilburn*¹; Tim Simpson¹; Todd Palmer¹; ¹Penn State University

9:50 AM

The Microstructure and Mechanical Properties of Ti-12Mo and Ti-12Mo-6Zr-2Fe -Titanium Alloy Fabricated Using Selective Laser Melting (SLM) In-situ Alloying: *Ranxi Duan*¹; Sophie Cox¹; Fuzeng Ren²; Moataz Attallah¹; ¹University of Birmingham; ²South China University of Science and Technology (SUSTech)

10:10 AM Break

10:30 AM

Laser Powder Bed Fusion of WHA: *Elias Jelis*¹; Michael Hespos¹; Matthew Clemente¹; ¹U.S. Army ARDEC-Picatinny Arsenal

MONDAY AM

10:50 AM

Additive Manufacturing of a Ti-6Al-4V and 304L Stainless Steel Functionally Graded Material: Investigating the Addition of an Intermediate V Section: *Lourdes Bobbio*¹; Brandon Bocklund¹; Richard Otis²; John Paul Borgonia²; R. Peter Dillon²; Andrew Shapiro²; Bryan McEnerney²; Zi-Kui Liu¹; Allison Beese¹; ¹Pennsylvania State Univ; ²Jet Propulsion Laboratory

11:10 AM

Reinforcement of Forming Blanks by Ultrasonic Additive Manufacturing: *Yongsen Rong*¹; Xiang Chen²; Bryant Gingerich¹; Leon Headings¹; Ryan Hahnlen²; Marcelo Dapino¹; ¹The Ohio State University; ²Honda R&D Americas

11:30 AM

DOE Remade Institute to Reduce Embodied Energy and Reduce Emissions: Pradeep Rohatgi¹; *Alan Luo*²; Magdi Azer³; ¹University of Wisconsin-Milwaukee; ²The Ohio State University; ³University of Illinois at Urbana

Additive Manufacturing of Metals: Microstructure and Material Properties — AM Process Parameters Effects

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

Monday AM
October 15, 2018

Room: A215
Location: Greater Columbus Convention Center

Session Chair: Andrzej Wojcieszynski, ATI Specialty Materials

8:00 AM Invited

Impact of the Process Gas Atmosphere in Laser Additive Manufacturing: Desired and Undesired Effects: Eric Jaegle¹; Anoop Kini¹; Michael Haines²; Markus Wilms³; Christian Baron¹; Hauke Springer¹; Nobuo Nakada⁴; Dierk Raabe¹; *Philipp Kürnsteiner*⁵; ¹Max-Planck-Institut fuer Eisenforschung; ²University of Tennessee - Knoxville; ³Fraunhofer Institut fuer Lasertechnik; ⁴Tokyo Institute of Technology; ⁵Max-Planck-Institut für Eisenforschung GmbH

8:40 AM

Mapping of the Relationship between Melt Pool Geometry and Crystallographic Texture of Inconel 718 Deposited via Laser Powder Bed Fusion Process: *Sneha Prabha Narra*¹; Jack Beuth¹; ¹Carnegie Mellon University

9:00 AM

Effect of Process Parameters on Surface and Microstructural Features of Direct Metal Laser Sintered Metals: *Aditya Patibandla*¹; Ashley Puente¹; Dustin Lindley²; ¹University of Cincinnati; ²University of Cincinnati Research Institute

9:20 AM

In-situ Tuning of Mechanical Properties in SLM Processed Materials: *Prashanth Konda Gokuldoss*¹; ¹Norwegian University of Science and Technology Gjøvik

9:40 AM

Effect of Hardness of Recoater Blade on Density and Buildability of Cellular Lattice Structures in the Laser Powder Bed Process: *Colt Montgomery*¹; Michael Brand¹; Robin Pacheco¹; Daniel Coughlin¹; John Carpenter¹; ¹Los Alamos National Laboratory

10:00 AM Break**10:20 AM**

Melt-Pool Scale Analysis of Metal Layers Processed by Powder Bed Fusion (PBF) Technique: *Yoon Suk Choi*¹; Seul-Bi Lee¹; Jae-Woong Kim¹; Jae-Keun Hong²; Myeongse Kim³; Dae-Geun Nam⁴; ¹Pusan National Univ; ²Korea Institute of Materials Science; ³KAMI; ⁴Korea Institute of Industrial Technology

10:40 AM

Scan Pattern and Energy Density Effects during Additive Manufacturing: *Robin Ward*¹; Rewnizad Mogrelia¹; Rachel Jennings¹; Moataz Attallah¹; ¹University of Birmingham

11:00 AM

The Effect of Heating Rate, Time-temperature on the Grain Boundary Character Distribution and Densification of Water-atomized 316L Stainless Steel Metallic Components Produced via Binder Jet-powder 3-D Printing System: *Yu Zhou*¹; Gregorio Solis-Bravo¹; C. Isaac Garcia¹; ¹University Of Pittsburgh

11:20 AM

The Effects of Scan Strategy on Crystallographic Texture, Microstructure and Mechanical Properties of Selectively Laser Melted AlSi10Mg Alloys: *Le Zhou*¹; Hao Pan¹; Holden Hyer¹; Sharon Park¹; Yuanli Bai¹; Yongho Sohn¹; ¹University of Central Florida

11:40 AM

Understanding Hot Cracking in Laser and Electron Beam Powder Bed Fusion of Al7075: *Sneha Prabha Narra*¹; Daming Ding¹; Shrivani Pandiya¹; Jack Beuth¹; ¹Carnegie Mellon University

Additive Manufacturing: In-situ Process Monitoring and Control — Session I

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

Monday AM
October 15, 2018

Room: A221
Location: Greater Columbus Convention Center

Session Chair: Ulf Ackelid, Freemelt AB

8:00 AM Invited

High-speed Imaging of the Powder-bed and Shield Gas during Laser PBF of Metals: P. Bidare¹; I. Bitharas¹; R.M. Ward²; M.M. Attallah²; *A.J. Moore*¹; ¹Heriot-Watt University; ²University of Birmingham

8:40 AM

Advancing High-speed Optical Monitoring of Spatter Tracking during Laser Powder Bed Fusion of Nickel Alloys and Aluminum Alloys: *Christopher Barrett*¹; Carolyn Carradero-Santiago¹; Eric MacDonald¹; Brett Conner¹; ¹Youngstown State University

9:00 AM

Characterizing Surface Defects in Additively Manufactured Components Using Smart-phone Imaging: *Mustafa Rifat*¹; Amol Kulkarni¹; Saurabh Basu¹; ¹Penn State

9:20 AM

On the Formation of Large Particles during Laser Powder Bed Fusion Additive Manufacturing: *Abdalla Nassar*¹; Edward Reutzell¹; Paul Guerrier²; Matthew Weldon¹; Michael Krane¹; ¹Applied Research Lab at Penn State; ²Moog Inc.

9:40 AM

Using Machine Learning to identify In-situ Melt Pool Flaw Formation Signatures: *Luke Scime*¹; Jack Beuth¹; ¹Carnegie Mellon University

10:00 AM Break**10:20 AM**

Multi Sensor In-situ Monitoring and Physics Based Modeling of Alloy 718 Microstructure: *Joe Walker*¹; Andrew Drieling¹; John Middendorf²; Glen Perram³; Nathan Klingbeil¹; Joy Gockel¹; ¹WSU; ²UTC; ³Air Force Institute of Technology



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

10:40 AM

Identification of Control Parameters for Porosity Detection in Selective Laser Melting: Franz-Josef Villmer¹; Eva Scheideler¹; *Andrea Huxol*¹; Filippo Simoni²; ¹OWL UAS; ²University of Trieste

11:00 AM

In-situ Defect Detection Using Three Color Spectroscopy in Laser Powder Bed Additive Manufacturing: *Andrew Drieling*¹; Joe Walker¹; John Middendorf²; Glen Perram³; Nathan Klingbeil¹; Joy Gockel¹; ¹Wright State University; ²Universal Technology Corporation; ³Air Force Institute of Technology

11:20 AM

Outfitting Commercial Laser Powder Bed Systems with Low-cost Optical, Thermal, and Surface Profiling Sensor Suites: A Data-driven Investigation: *Greg Loughnane*¹; John Middendorf¹; Ryan O'Hara²; Li Yang³; ¹Universal Technology Corporation; ²Air Force Institute of Technology; ³University of Louisville

11:40 AM

Revealing Mechanisms of Residual Stress Development in Additive Manufacturing via Digital Image Correlation: *Jamison Bartlett*¹; Brendan Croom¹; Jeffrey Burdick²; Daniel Henkel²; Xiaodong Li¹; ¹University of Virginia; ²Commonwealth Center for Advanced Manufacturing

Additive Manufacturing: Modeling and Simulation of AM Materials, Processes, and Mechanics — AM Modeling - Session I

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

Monday AM
October 15, 2018

Room: A223
Location: Greater Columbus Convention Center

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

8:00 AM

An Integrated Computational Materials Engineering (ICME) Approach for Inconel 718 Additive Manufacturing: *Qiaofu Zhang*¹; Abhinav Saboo¹; Jiadong Gong¹; Greg Olson¹; ¹QuesTek Innovations LLC

8:20 AM

Correlations of Cracking with Scan Strategy and Build Geometry in Electron Beam Powder Bed Additive Manufacturing: *Yousub Lee*¹; Mike Kirka¹; Ryan Dehoff¹; ¹Oak Ridge National Lab

8:40 AM

Modelling Residual Stresses in Powder Bed Fusion Processes: Validation & Application: *Mustafa Megahed*¹; Alonso Peralta²; ¹Esi Group; ²Honeywell Aerospace

9:00 AM

Numerical Simulations of Crack Extensions in Additive Manufactured Fracture Specimens of Hydrogen-uncharged and Charged 304 Stainless Steels Using Cohesive Zone Model: *Shin-Jang Sung*¹; Shengjia Wu¹; Jwo Pan¹; Paul Korinko²; Michael Morgan²; Poh-Sang Lam²; Anthony McWilliams²; ¹University Of Michigan; ²Savannah River National Laboratory

9:20 AM

Phase Field Modeling of Microstructure Evolution in Selective Laser Melting Process through a Multiscale Scheme: *Yao Fu*¹; ¹University of Cincinnati

9:40 AM Keynote

Simulation-experiment Comparison for Strain Field around a Pore: Robert Suter¹; *Anthony Rollett*¹; Rachel Lim¹; Yufeng Shen¹; Vahid Tari¹; Ross Cunningham¹; Joel Bernier²; ¹Carnegie Mellon University; ²Lawrence Livermore National Laboratory

10:10 AM Break

10:30 AM Keynote

The Influence of Surface Finish on the Topography of Laser Tracks: *Richard Ricker*¹; Jarred Heigel¹; Jason Fox¹; ¹National Institute of Standards & Tech

11:00 AM

Thermal-material Simulation to Predict Microstructure Evolution in Additive Manufacturing: *Daniel Lewis*¹; Antoinette Maniatty¹; Scott Peters¹; James Dolan¹; ¹Rensselaer Polytechnic Institute

11:20 AM

Simulations of Selective Laser Melting by Smoothed Particle Hydrodynamics Method: *Deepak Shah*¹; Alexey Volkov¹; ¹University of Alabama

Additive Manufacturing: Powder Characterization and Recycling — Powder Characterization

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

Monday AM
October 15, 2018

Room: A224
Location: Greater Columbus Convention Center

Session Chair: Mathieu Brochu, McGill University

8:00 AM

Optimizing Thermal Parameters for Powder Pre-processing Treatments: *Caitlin Walde*¹; Danielle Cote¹; Richard Sisson¹; Victor Champagne²; ¹Worcester Polytechnic Institute; ²US Army Research Laboratory

8:20 AM

Measuring Inconel 625 Powder Thermal Conductivity in SLM by Laser Flash: *Shanshan Zhang*¹; Brandon Lane²; Justin Whiting²; Kevin Chou¹; ¹University of Louisville; ²National Institute of Standards and Technology

8:40 AM

Characterization and Qualification of Bulk Feedstock Powders Using Machine Learning and Computer Vision: *Anna Smith*¹; Srujana Yarasi¹; Elizabeth Holm¹; ¹Carnegie Mellon University

9:00 AM Invited

Understanding the Relationships between Chemistry and Flowability via GranuDrum™ in Aluminium Alloys for Powder Bed Fusion Additive Manufacture: *Jose Alberto Muñiz Lerma*¹; Amy Nommets-Nomm¹; Mathieu Brochu¹; ¹McGill University

9:40 AM

Computer Vision and Machine Learning to Associate Powder Characteristics with Flow Properties for Additive Manufacturing: *Srujana Yarasi*¹; Anna Smith¹; Anthony Rollett¹; Elizabeth Holm¹; ¹Carnegie Mellon University

10:00 AM Break

10:20 AM

Characterization Methods for Powder Bed Fusion Feedstocks: Zackary Snow¹; *Ken Meinert*¹; Sanjay Joshi²; Brett Conner³; Rich Martukanitz¹; ¹Applied Research Lab, The Pennsylvania State University; ²Department of Industrial and Manufacturing Engineering, The Pennsylvania State University; ³Youngstown State University

MONDAY AM

11:00 AM

Study of the Usability of Hydride-Dehydride (HDH) Ti-6Al-4V Powders in Electron Beam Powder Bed Printing: *Ziheng Wu*¹; Rahi Patel¹; Joe Capone¹; Muktesh Paliwal¹; Jack Beuth¹; Anthony Rollett¹; Sneha Narra¹; ¹Carnegie Mellon University

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

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

Monday AM
October 15, 2018

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

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

8:00 AM

Effects of Rapid Solidification and Numerical Modelling of Laser Cladded Ti-Al-Cu Coatings on Ti-6Al-4V Alloy: *Olawale Fatoba*¹; Rezvan Gharehbaghi¹; Stephen Akinlabi¹; Esther Akinlabi¹; ¹University of Johannesburg

8:20 AM

Effect of Ni-Cr FLAME SPRAY Coating Parameters on Corrosion Properties: *Arisha Nasik*¹; Muhammad Ishtiaq¹; Muhammad Shamsi¹; Shahmin Shah¹; Aqil Inam¹; Iqra Siddique¹; Syed Naqvi¹; ¹University of the Punjab

8:40 AM

Fatigue Life of a NiCr-Coated Powder Metallurgy Disk Superalloy after Varied Pre- and Post-coat Processing and Environmental Exposures at 760°C: *Tim Gabb*¹; James Nesbitt¹; Derek Hass²; Susan Draper¹; Bernadette Puleo¹; Jack Telesman¹; Robert Miller³; ¹NASA Glenn Research Ctr; ²Directed Vapor Technologies International, Inc.; ³Vantage Partners, LLC

9:00 AM

Electrodeposited Inconel and Stellite like Coatings for Improved Corrosion Resistance in Biocombustors: Timothy Hall¹; *Santosh Vijapur*¹; Maria Inman¹; EJ Taylor¹; Michael Brady²; ¹Faraday Technology Inc; ²Oak Ridge National Lab

9:20 AM

High Performance Amorphous Thermal Sprayed Coatings for Molten Salt Environment: *Evelina Vogli*¹; Stephen Raiman²; Bruce Pint²; Ricardo Salas¹; John Kang¹; ¹Lm Group Holdings Inc; ²ORNL

9:40 AM

Overlays for Protection against Impact Wear in Mining Applications: Gary Fisher¹; Tonya Wolfe¹; *Johanna Meier*¹; ¹InnoTech Alberta

10:00 AM Break

10:20 AM

Automated Case-depth Analysis with a Decision Tree: *Andrew Storey*¹; ¹LECO Corporation

10:40 AM

Numerical Modelling and Influence of Silicon Addition on the Surface Analyses of Laser Deposited Al-Sn-Si Coatings on Ti-6Al-4V Alloy: *Olawale Fatoba*¹; Esther Akinlabi¹; Rezvan Gharehbaghi¹; Stephen Akinlabi¹; ¹University of Johannesburg

Advanced Materials for Harsh Environments — Advanced Materials for Harsh Environments I

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

Monday AM
October 15, 2018

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

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

8:00 AM Invited

Additive Manufacturing of Glass Freestanding Structures Using Fiber Feedstock: John Hostetler¹; Jason Johnson¹; Jonathan Goldstein²; Robert Landers¹; Douglas Bristow¹; Richard Brow¹; *Edward Kinzel*¹; ¹Missouri University of Science and Technology; ²Air Force Research Laboratory

8:40 AM

Durability Assessment of Al_{0.1}CoCrFeNi High Entropy Alloy under Extreme Conditions: Harpreet Grewal¹; Rakesh Nair¹; Harpreet Arora¹; *Sundeep Mukherjee*²; ¹Shiv Nadar University; ²University of North Texas

9:00 AM

Effect of Dopant and Heat Treatment on the Microstructure and Mechanical Properties of Nickel-aluminum Bronze: *Amaechi Anene*¹; Nkem Nwankwo¹; Victor Nwoke¹; ¹Nnamdi Azikiwe University, Awka

9:20 AM

Effect of Steam and Temperature on Rapid Internal Oxidation-Sulfidation Initiated by CaSO₄ Deposits: *Patrick Brennan*¹; Brian Gleeson¹; ¹University of Pittsburgh

9:40 AM

Electrochemical Impedance Characterization of YSZ for Temperature and O₂ Sensing: *Travis Peters*¹; Sheikh Akbar¹; Jiayi Lin²; Dean Modroukas²; ¹Ohio State University; ²Innoeering

10:00 AM Break

10:20 AM

Electrodeposited MCrAlY Coatings for Gas Turbine Engine Applications: *Ying Zhang*¹; Brian Bates¹; Jason Witman¹; Sebastien Dryepondt²; ¹Tennessee Tech University; ²Oak Ridge National Laboratory

10:40 AM Concluding Comments

Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder — Session I

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

Monday AM
October 15, 2018

Room: B140/141
Location: Greater Columbus Convention Center

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

9:00 AM Invited

Reliability of Joint Bonded by Micro-sized Ag Particles for Die-attach in Power Devices: *Hiroshi Nishikawa*¹; ¹Osaka University



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 GREATER COLUMBUS CONVENTION CENTER
 COLUMBUS, OHIO, USA

9:20 AM

Effect of Thermal History and Composition on the Microstructure and Reliability of Copper Pillar Solder Joints: *Mohammed Genanu*¹; Eric Cotts¹; Francis Mutuku¹; Babak Arfaei¹; Faramarz Hadian¹; ¹Binghamton University

9:40 AM

Progress in Development of Pb-free High Temperature Composite Solder: *Iver Anderson*¹; Stephanie Choquette¹; ¹Iowa State Univ, Ames Laboratory

10:00 AM Break

10:20 AM Invited

Transient Liquid Phase Bonding as a High Temperature Pb-Free Alloy Alternative: Fei Dong¹; Hamid Fallahdoost¹; *Junghyun Cho*¹; ¹State University of New York

10:40 AM

Transient Liquid Phase Reaction in Sn-Bi-Ag System: *Yaohui Fan*¹; John Blendell¹; Carol Handwerker¹; ¹Purdue University

11:00 AM

Undercooling in Sn Droplets as a Function of Impurity Content: *Sitaram Panta*¹; Eric Cotts¹; ¹Binghamton University

11:20 AM

The Study of Corrosion Resistance for High Reliability Devices: *Albert T. Wu*¹; Tsan-Hsien Tseng¹; Freeze Wang²; Chih Yuan Hsiao²; ¹National Central University; ²Taiwan Uyemura Co Ltd

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

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

Monday AM
 October 15, 2018

Room: A226
 Location: Greater Columbus Convention Center

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

8:00 AM

Tempering and Austempering Response of a Double Soaked Medium Manganese Steel: *Alexandra Glover*¹; John Speer¹; Emmanuel De Moor¹; ¹Advanced Steel Processing and Products Research Center, Colorado School of Mines

8:20 AM

Cold Stamping 1500 to 1800MPa Structural and Energy Absorbing Components to <2T Bend Radii from Coil-to-Coil Flash Processing: *Gary Cola*¹; ¹SFP Works LLC & Sirius Protection LLC

8:40 AM

Effect of the Heating Rate on Austenite Formation and Its Subsequent Transformation in a 22MnB5 Steel: *Juan Pedraza*¹; Rafael Landa-Mejia²; Gregorio Solis-Bravo²; Omar Garcia-Rincon¹; Isaac Garcia²; ¹Temium Mexico SA de CV; ²University of Pittsburgh

9:00 AM

Low Alloy High Strength Martensitic Nitrogen Steel: *John Chinella*¹; ¹US Army Research Laboratory

9:20 AM

Microstructure Control and Correlation to Formability of Low Alloy Steel Via Flash Processing: *Benjamin Shassere*¹; Sudarsanam Babu²; Gary Cola³; Thomas Muth¹; Thomas Watkins¹; ¹Oak Ridge National Laboratory; ²University of Tennessee; ³SFP Works LLC

9:40 AM

Development of the Plate Steels with Grain Refined Surface Layers: *Il-cheol Yi*¹; Jae-Young Cho¹; Sang-Ho Han¹; ¹POSCO Technical Research Lab.

10:00 AM Break

10:20 AM

Development of Nanostructured Bainitic Steel: *Bismillah Saleem*¹; Muhammad Ishtiaq¹; Muhammad Shamsi¹; Muhammad Mughal¹; Aqil Inam¹; ¹University of the Punjab

10:40 AM

Microstructural Modifications in a Low-alloy High-performance Steel: *V. Sinha*¹; E.J. Payton²; M. Gonzales²; R.A. Abrahams²; B.S. Song²; ¹Air Force Research Laboratory/UES, Inc.; ²Air Force Research Laboratory

11:00 AM

Structure-property Correlations of Submicron Sized Nb–Ti Stabilized Low C Microalloyed and IF Steels Processed through Advance Rolling and SPD Techniques: *Sumit Ghosh*¹; Suhrit Mula¹; ¹Indian Institute of Technology,Roorkee

11:20 AM

Effect of Alloy Composition and Microstructure on Yield Ratio and Elongation of DP Steel: *Yeon-sang Ahn*¹; Sangho Han¹; John Speer²; ¹POSCO Technical Research Laboratories; ²Colorado School of Mines

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

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

Monday AM
 October 15, 2018

Room: B132
 Location: Greater Columbus Convention Center

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

8:00 AM Invited

Symmetry Breaking in Bulk Ceramics and Crystals: *Dragan Damjanovic*¹; Sina Hashemizadeh¹; Emad Oveisi²; S. De Zanet³; Takuya Hoshina⁴; Andreja Bencan⁵; Tadej Rojac⁵; Goran Drazic⁶; ¹EPFL SCI STI DD; ²EPFL CIME; ³Ecole Polytechnique Federale De Lausanne CIME; ⁴Tokyo Institute of Technology; ⁵Jozef Stefan Institute; ⁶National Institute of Chemistry

8:20 AM Invited

Influence of LNO Bottom Electrode and Target Stoichiometry on the Properties of 0.67Pb(Mg_{1/3}Nb_{2/3})O₃–0.33PbTiO₃ Thin Films: *Matjaz Spreitzer*¹; Urška Gabor¹; Damjan Vengust¹; Aleksander Matavž¹; Danilo Suvorov¹; ¹Jožef Stefan Institute

8:40 AM Invited

Semiconductor Ceramic Properties in the Light of the Fractal Nature Corrections Frontiers: *Vojislav Mitic*¹; Goran Lazovic²; Vesna Paunovic³; Zoran Vosika³; Sandra Veljkovic³; Branislav Vlahovic⁴; ¹University of Nis; Institute of Technical Sciences of SASA; ²University of Belgrade; ³University of Nis; ⁴North Carolina Central University

9:00 AM Invited

Effect of Atmosphere on Dielectric Properties of Calcium Copper Titanate Ceramics: Disna Samarakoon¹; Nirmal Govindaraju¹; *Raj Singh*¹; ¹Oklahoma State University

MONDAY AM

9:20 AM Invited

Physical Properties of BFO-modified Multiferroic Ceramics: Effect of Rare-earth Cations Size: Yosdan Martínez Camejo¹; Ruyan Guo²; Amar Bhalla²; *Jose de los Santos Guerra*¹; ¹Universidade Federal de Uberlandia; ²The University of Texas at San Antonio

9:40 AM

Experimental and Numerical Evaluation of Stacked Piezoelectrics for Mechanical Energy Harvesting: *Bryan Gamboa*¹; Ruyan Guo¹; Amar Bhalla¹; ¹The University of Texas at San Antonio

10:00 AM Break**10:20 AM Invited**

Structural Phase Transitions in $\text{Bi}_{1-x}\text{Nd}_x\text{Fe}_{1-y}\text{Co}_y\text{O}_3$ Compositions: *Luiz Fernando Cotica*¹; Anuar Mincache¹; Odair Oliveira¹; Gustavo Dias¹; Ivair Santos¹; Ruyan Guo²; Amar Bhalla²; ¹State University Of Maringá; ²University of Texas at San Antonio

10:40 AM

Development of Ferroic and Multiferroic NanoMaterials for Drop-on-Demand Microfabrication: *Brandon Young*¹; Bryan Gamboa¹; Denise Alanis²; Luiz Fernando Cotica²; Amar Bhalla¹; Ruyan Guo¹; ¹University of Texas at San Antonio; ²State University of Maringá

11:00 AM

Novel Two Phase Self-assembled Nanopillar Heterostructures with E-field Induced Magnetization Manipulation: *Xiao Tang*¹; Min Gao¹; Chung Ming Leung¹; Jiefang Li¹; Dwight Viehland¹; ¹Virginia Tech

11:20 AM

Magnetolectric Coupling Induced Multistate Magnetization: *Zhiguang Wang*¹; Yanxi Li²; Dwight Viehland²; ¹Xi'an Jiaotong University; ²Virginia Tech

11:40 AM

Study of Magnetolectric Properties in $\text{Bi}_{1-x}\text{Nd}_x\text{Fe}_{1-y}\text{Co}_y\text{O}_3$ Compositions: *Anuar Mincache*¹; Odair Oliveira²; Luiz Cótica²; Ivair Santos²; Gustavo Sanguino²; Amar Bhalla³; Ruyan Guo³; ¹State University of Maringá; ²State University of Maringá; ³University of Texas at San Antonio

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

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

Monday AM
October 15, 2018

Room: A225
Location: Greater Columbus Convention Center

Session Chair: Joseph McDermid, McMaster University

8:00 AM

Impact of Roughness Length Scale on Spectral Emissivity during Intercritical Annealing of Advanced High Strength Steels: *Kaihsiang Lin*¹; Simon Trivett¹; Kyle Daun¹; ¹UW

8:20 AM

Influence of Processing Heat Cycles on the Mechanical Properties and Zinc Adhesion of Advanced High Strength Steels: *Marina Pushkareva*¹; Myriam Brochu¹; ¹Polytechnique Montreal

8:40 AM

Effect of Liquid Metal Embrittlement Cracks on Resistance Spot Weld Fracture: *Chris DiGiovanni*¹; Andrew Macwan²; Elliot Biro¹; Norman Zhou¹; ¹University of Waterloo; ²ArcelorMittal Global Research

9:00 AM

Interaction of Zinc Penetration and Propagation for Liquid Metal Embrittlement Cracks in Zinc-coated AHSS Resistance Spot Welds: *Yeongdo Park*¹; Siva Prasad Murugan¹; Chun Chang Keun²; ¹Dong-Eui University; ²Research Institute of Industrial Science & Technology

9:20 AM

Liquid Metal Embrittlement in Laser Beam Welding of Zn-coated Advanced High Strength Steels: *Mohammad Hadi Razmipoosh*¹; Elliot Biro¹; Norman Zhou¹; ¹University of Waterloo

9:40 AM

Weldability Evaluation of Zn and Al-Si Coated Hot Press Forming (HPF) Steels in Resistance Spot Welding: *Changwook Ji*¹; Joo Yong Cheon¹; Jae Hoon Kim¹; ¹Korea Institute of Industrial Technology

Boron, Boron Coatings, Boron Compounds and Boron Nanomaterials: Structure, Properties, Processing, and Applications — 2D Boron & Clusters

Program Organizers: Jens Kunstmann, Technische Universität Dresden; Roumiana Petrova, New Jersey Institute of Technology; Scott Beckman, Washington State University

Monday AM
October 15, 2018

Room: B244/245
Location: Greater Columbus Convention Center

Session Chair: Jens Kunstmann, TU Dresden

8:00 AM Invited

Recent Advances in Structure and Bonding of Boron Clusters: *Minh Tho Nguyen*¹; ¹KU Leuven

8:40 AM Invited

Dirac Δ -Cones in χ_3 Borophene: *Iwao Matsuda*¹; ¹the University of Tokyo

9:20 AM Invited

Hydrogen Boride Sheets Derived from MgB_2 by Cation Exchange: *Takahiro Kondo*¹; ¹University of Tsukuba

10:00 AM Break**10:20 AM Invited**

Structure and Properties of 2D Borocarbonitrides as Predicted by First-principles Calculations: *Nevill Gonzalez Szwacki*¹; ¹Faculty of Physics, University of Warsaw

Catalyst Support Materials and Support Effect — Catalyst Support Materials and Support Effect

Program Organizers: Ruigang Wang, The University Of Alabama; Zhenmeng Peng, University of Akron; Bin Liu, Kansas State University

Monday AM
October 15, 2018

Room: C170
Location: Greater Columbus Convention Center

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

8:00 AM

Intriguing Catalyst Supports via Additive Manufacturing: *Joe Cesarano*¹; John Stuecker¹; James Miller²; Robert Ferrizz²; ¹Robocasting Enterprises; ²Sandia National Labs



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 COLUMBUS, OHIO, USA

8:20 AM

Catalytic Application of Palladium Based Hierarchical Hybrid Carbon Material: *Wenhu Wang*¹; Marlikarjuna Nadagouda¹; Sharmila Mukhopadhyay¹; ¹Wright State University

8:40 AM

New Technique For Restoring Catalyst Activity In MIDREX DR Plants (SEALPRO-G): *Gaber Hefny*¹; ¹EZDK

9:00 AM

Effect of Metal-support Interaction on Catalytic Activity and Redox Property of Supported Co-M (M= Ru, Pd, Ag, Pt and Au) Bimetallic Catalysts: *Zhongqi Liu*¹; Junhao Li¹; Ruigang Wang¹; ¹The University of Alabama

9:20 AM

Ab Initio Modeling of Catalysis with Surface Overlayers: *Maytal Caspary Toroker*¹; ¹Technion - Israel Institute of Technology

9:40 AM

Surface Property Optimization for Improved Efficiency of the Environmental Control and Life Support System: Timothy Hall¹; *Dan Wang*¹; Santosh Vijapur¹; EJ Taylor¹; Carlos Cabrera²; Armando Peña-Duarte²; Melissa Vega-Cartagena²; ¹Faraday Technology Inc; ²University of Puerto Rico,

10:00 AM Break

10:20 AM Invited

Nitrogen-doped Ordered Mesoporous Carbon/Graphene Framework as Dual Electrocatalyst for Oxygen Reduction and Evolution Reactions: *Zhenmeng Peng*¹; ¹University of Akron

10:50 AM

Support Structure and Reduction Treatment Effects on CO Oxidation of SiO₂ Nanospheres and CeO₂ Nanorods Supported Ruthenium Catalysts: *Junhao Li*¹; Zhongqi Liu¹; Ruigang Wang¹; ¹The University of Alabama

11:10 AM

Catalyst Reduction of MIDREX Direct Reduction Plants without Using Natural Gas, New Technique: *Gaber Hefny*¹; ¹EZDK

Ceramic and Crystal Materials for Optics and Photonics — Session I

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Michael Squillante, RMD, Inc; Akio Ikesue, World-Lab. Co., Ltd; Mark Dubinskiy, Amy Research Laboratory

Monday AM
 October 15, 2018

Room: A113
 Location: Greater Columbus Convention Center

Session Chairs: Woohong (Rick) Kim, Naval Research Laboratory; Yiquan Wu, Alfred University

8:00 AM Invited

Transparent Polycrystalline Ceramics Fabricated under High Pressure and Temperature: *Norimasa Nishiyama*¹; Fuminiro Wakai¹; ¹Tokyo Institute of Technology

8:40 AM Invited

Powder Engineering for Highly Transparent Rare-earth Sesquioxide Ceramics: *Ji-Guang Li*¹; ¹National Institute for Materials Science

9:20 AM Invited

Solid-state Sintering of Zinc Sulfide Based Infrared Optical Ceramics: *Yiyu Li*¹; Yiquan Wu¹; ¹Alfred University

9:40 AM Invited

Advanced Optical Materials for IR Applications: *Woohong (Rick) Kim*¹; Guillermo Villalobos¹; Shyam Bayya¹; Brandon Shaw¹; Colin Baker¹; Michael Hunt¹; Lynda Busse¹; Darryl Boyd¹; Bryan Sadowski²; Ishwar Aggarwal²; Jasbinder Sanghera¹; ¹Naval Research Laboratory; ²KeyW Corp.

10:00 AM Break

10:20 AM Invited

Promising Magneto-optical Ceramics for High Power Faraday Isolators: *Jiang Li*¹; Jiawei Dai¹; ¹Shanghai Institute of Ceramics, Chinese Academy of Sciences

10:40 AM Invited

Recent Progress on the MIR Laser Applications of Tm-doped and Er-doped Fluorite-type Crystals: *Liangbi Su*¹; Fengkai Ma¹; Xinsheng Guo¹; Dapeng Jiang¹; Jie Liu²; Tao Li³; Jun Xu⁴; ¹Shanghai Institute of Ceramics, Chinese Academy of Sciences; ²Shandong Normal University; ³Shandong University; ⁴Tongji University

11:20 AM Invited

Refractive Index Patterning of Infrared Glass Ceramics through Laser-induced Vitrification: *Myungkoo Kang*¹; Laura Siskin¹; Justin Cook¹; Cesar Blanco¹; Martin Richardson¹; Ilya Mingareev²; Kathleen Richardson¹; ¹University of Central Florida; ²University of Central Florida; Florida Institute of Technology

Characterization & Methods in Failure Analysis — Tools & Techniques I

Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

Monday AM
 October 15, 2018

Room: A211
 Location: Greater Columbus Convention Center

Session Chairs: Erhan Ulvan, Acuren Group Inc.; Mark Russell, Engineering Design & Testing Corporation; Tim Jur, Engineering Design & Testing Corporation; Ellen Wright, Engineering Systems Inc.

8:00 AM

Investigating and Trending Precursor Failures to Prevent Major Incidents: *Nicholas Cherolis*¹; Daniel Benac¹; ¹Baker Engineering and Risk Consultants, Inc.

8:20 AM

Investigative Use of Reverse Engineering Techniques: Application to Metallurgical Laboratory Analysis of an Aircraft Accident: *Dale Alexander*¹; Robert Franzese¹; Matthew Kenner¹; Alison Maratea¹; Gary Novak¹; Michael Stevenson¹; Jacob Wagner¹; ¹ESI

8:40 AM

Failure Analysis of Hydraulic Components: *Yindong Ge*¹; ¹Parker Hannifin Corporation

9:00 AM

Avoiding Mischaracterization of Metallographic and Fractographic Features of Copper Alloys Used in Potable Water Systems: *Eric Weishaup*¹; ¹ESI

9:20 AM

Analysis of Gear Machining Profile Mismatch to avoid Premature Failure: *Ahmed Elkholi*¹; ¹Kuwait University

9:40 AM Invited

Use of Eddy Current Conductivity and Hardness Testing to Evaluate Heat Damage in Aluminum Alloys: *Erik Mueller*¹; Luis Carney²; Kara Mixson²; ¹NTSB; ²NAVAIR Materials Engineering, ISSC-Jacksonville

MONDAY AM

10:00 AM Break

10:20 AM

Quasi-dynamic Approach of X-ray Computed Tomography for Characterization of Progressive Damage in Composite Materials and Structures: *Ryan Deacon*¹; Mark Gurvich¹; Neal Magdefrau¹; Matthew Mordasky¹; Greg Ojard¹; Kerisha Williams¹; ¹United Technologies Research Center

10:40 AM Invited

Detection of Cracks in Materials Using Heterodyne Lock-in Hermography and Signal Processing Techniques: Marat Khafizov¹; *Kevin Agarwal*¹; ¹The Ohio State University

11:00 AM Invited

EBSD as a Technique for Visualizing and Better Analyzing Failure/Fatigue Properties: *Michael Hjelmstad*¹; ¹Oxford Instruments

11:20 AM Invited

Endoscopy as a Tool for Failures Prevention in Machineries: *Pierre Dupont*¹; Pierre Dupont¹; ¹Schaeffler Belgium Sprl/Bvba

11:40 AM

Integrated 3D Data Analysis for Metallurgical Failure Analysis: Matthew Kenner¹; *Michael Stevenson*¹; Robert Bailey¹; Gary Rogers¹; Pierce Umberger¹; Dale Alexander¹; ¹ESI

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

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

Monday AM

October 15, 2018

Room: C150

Location: Greater Columbus Convention Center

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

8:00 AM Invited

Abnormal Grain Growth in Beta-annealed Ti-6Al-4V: *V. Sinha*¹; A.L. Pilchak²; E.J. Payton²; S.L. Semiatin²; ¹Air Force Research Laboratory/UES, Inc.; ²Air Force Research Laboratory

8:30 AM Invited

Modeling Abnormal Grain Growth in Beta-annealed Ti-6Al-4V: *Adam Pilchak*¹; Lee Morris²; Shesh Srivatsa³; Ryan O'Hara²; V. Sinha⁴; Eric Payton; Lee Semiatin²; ¹Air Force Research Laboratory; ²Air Force Institute of Technology (AFIT); ³Srivatsa Consulting, LLC; ⁴Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/RXCM and UES, Inc.; ⁵Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/RXCM

9:00 AM

Accelerated Sintering of Powder Metallurgy (PM) Ti-6Al-4V Alloy at the Beta Transus and Its High Fatigue Performance: Pankaj Kumar¹; *K.S. Ravi Chandran*¹; ¹University of Utah

9:20 AM

Heat Treatment of Alpha+Beta Titanium Alloys: *Alireza Fadavi Boostani*¹; Shiraz Mujahid²; Andrew L. Oppedal¹; Wilburn R. Whittington²; Cory Krivanec¹; Haitham El Kadiri²; ¹Center for Advanced Vehicular Systems; ²Mississippi State University

9:40 AM Invited

Computational Design of Heterogeneous Microstructures for Alpha+Beta Ti-Alloys: Tianlong Zhang¹; Dong Wang¹; Yufeng Zheng²; Rongpei Shi²; Hamish Fraser²; *Yunzhi Wang*²; ¹Xi'an Jiaotong University; ²The Ohio State University

10:10 AM Break

10:30 AM

A Critical Analysis of Thermo-mechanical Simulation and Testing of Powder-metallurgy Titanium Alloys: *Austin Mann*¹; Ali Yousefiani¹; James Dobbs¹; Karen Thacker¹; ¹Boeing Research & Technology

10:50 AM

Effect of Rapid Heat Treatment on the Microstructure of Alpha+ Beta Titanium Alloys: *Shiraz Mujahid*¹; Alireza Boostani¹; Andrew Oppedal¹; Wilburn Whittington¹; Cory Krivanec¹; Haitham ElKadiri¹; ¹Mississippi State University

11:10 AM

Structure and Mechanical Properties of Layered Materials on Base of Ti-6Al-4V Alloy Fabricated Using Powder Metallurgy Approach: *Pavlo Markovskiy*¹; Orest Ivasishin¹; Dmytro Savvakyn¹; Vadym Bondarchuk¹; Oleksandr Stasiuk¹; Sergey Prikhodko²; ¹Institute for Metal Physics; ²University of California Los Angeles

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

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

Monday AM

October 15, 2018

Room: B232

Location: Greater Columbus Convention Center

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

8:00 AM Introductory Comments

8:10 AM Invited

Curricular Innovations and Continuous Improvement of Academic Programs (and Satisfying ABET along the Way): The Elizabeth Judson Memorial Symposium: *Joseph Sussman*¹; Michael Milligan¹; ¹ABET

8:50 AM

Changes in ABET Engineering Criteria 3 and 5: *Jeffrey Fergus*¹; ¹Auburn University

9:30 AM Invited

Practical Advice on Preparing for an EAC/ABET Accreditation Visit: *Gregg Janowski*¹; ¹University of Alabama at Birmingham

10:10 AM Break

10:30 AM Panel: Panel Discussion includes Joseph Sussman, Jeffrey Fergus, Gregg Janowski, and Devarajan Venugopalan



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COLUMBUS, OHIO, USA

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

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

Monday AM
October 15, 2018

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

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

8:00 AM Break

8:30 AM Keynote

Characterizing the Local Electrochemical Effects on Environmental Assisted Cracking: *Homero Castaneda*¹; *Ankit Srivastava*¹; ¹Texas A&M University

9:10 AM

Synergistic Effects of Corrosion and Slow Strain Rate Loading on the Mechanical Behavior of an Aluminum Alloy: *Xinzhu Zheng*¹; *Homero Castaneda*¹; *Ankit Srivastava*¹; ¹Texas A&M University

9:30 AM

Comparison of the Effect of Sensitization on Corrosion Fatigue of AA5456-H116 for In-service Versus Laboratory Accelerated Sensitization: *Allison Akman*¹; *Jenifer (Warner) Locke*¹; ¹Ohio State University

9:50 AM Invited

Corrosion Fatigue of AZ31B Magnesium Alloy with Hard Ceramic Surface Coating: *Xin Pang*¹; *Yuna Xue*²; *Bailing Jiang*³; *Hamid Jahed*⁴; ¹CanmetMATERIALS, Natural Resources Canada; ²Xi'an University of Technology; ³University of Waterloo; ⁴Xi'an University of Technology; ⁴University of Waterloo

10:10 AM Break

10:30 AM

Desensitization of Al-Mg Alloys with Boron Addition: *Ramasis Goswami*¹; *Syed Qadri*¹; ¹Naval Research Laboratory

10:50 AM

Development of Predictive Capabilities for Stress Corrosion Cracking of Corrosion Resistant Alloys via Empirical and First Principles Methods: *Brandon Free*¹; *James Saal*²; *Pin Lu*²; *Christopher Taylor*¹; *John Scully*³; *Jenifer (Warner) Locke*⁴; ¹Fontana Corrosion

Center, The Ohio State University; ²QuesTek Innovations LLC; ³Department of Materials Science and Engineering, University of Virginia; ⁴The Ohio State University

Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology — Chemical and Transport Processes in Glasses

Program Organizers: John Kieffer, University of Michigan; Liping Huang, Rensselaer Polytechnic Institute

Monday AM
October 15, 2018

Room: A115
Location: Greater Columbus Convention Center

Session Chair: To Be Announced

8:10 AM Invited

Amorphous Transitions: The Role of Metasomatic Changes on Glass Corrosion Performance: *Joseph Ryan*¹; ¹Pacific Northwest National Laboratory

8:40 AM Invited

A Structural Approach to Understand the Corrosion of Aluminoborate Glasses: *Ashutosh Goel*¹; *Saurabh Kapoor*¹; *Randall Youngman*²; *Nicholas Smith*²; ¹Rutgers, The State University of New Jersey; ²Corning Incorporated

9:10 AM

Predicting the Dissolution Kinetics of Silicate Glasses Using Machine Learning: *N. M. Anoop Krishnan*¹; *Mathieu Bauchy*²; ¹IIT Delhi; ²University of California, Los Angeles

9:30 AM Invited

Understanding Silicate Glass-water Interactions and Reactions from Atomistic Based Computer Simulations: *Jincheng Du*¹; ¹University of North Texas

10:00 AM Break

10:20 AM Invited

New Solid State Na⁺ Ion Conducting Glassy Solid Electrolytes: *Steve W. Martin*¹; ¹Iowa State University

10:50 AM

Ionic Mobility and Mechanical Stiffness in Mixed-Network Former Glasses: Experiments vs. Molecular Simulations: *Vazrik Keshishian*¹; *Rafat Mohammadi*¹; *John Kieffer*¹; ¹University of Michigan

IMS Symposium on Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties — Metallographic Preparation Techniques of Materials

Program Organizers: Daniel Dennies, DMS, Inc.; James Martinez, NASA Johnson Space Center; Michael Keeble, Buehler, A Division of ITW; Jaret Frafjord, IMR Test Labs - Portland

Monday AM
October 15, 2018

Room: A212
Location: Greater Columbus Convention Center

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

8:00 AM

Mechanism of Etching of Al-4.5Mg-1.0Mn Alloy: *Aline D. Gabbardo*¹; *Xi Wang*¹; *Angeire Huggins*¹; *Gerald Frankel*¹; ¹Ohio State University

8:20 AM Invited

Polymerography: Chemical Etching of Polymers: *Andrew Havics*¹; ¹PH2 LLC

MONDAY AM

8:40 AM

Chemical Etching of Porcelain: *Max Modugno*¹; Hyojin Lee¹; William Carty¹; ¹New York State College of Ceramics at Alfred University

9:00 AM

Etching of Polycrystalline Alumina: *Sarah Whipkey*¹; Hyojin Lee¹; William Carty¹; ¹Alfred University

9:20 AM Invited

Metallographic Preparation of Coatings: *Jessica Enos*¹; ¹Allied High Tech Products

9:40 AM Invited

Metallographic Preparation of Soft and Ductile Materials Using Mechanical Polishing Techniques: *Michael Keeble*¹; ¹Buehler

10:00 AM Break

10:20 AM Invited

Microchemical Testing as a Tool for the Materials Engineer: *Andrew Havics*¹; ¹PH2 LLC

10:40 AM Invited

Examination of the Steel Used to Construct the USS Arizona: *George Vander Voort*¹; ¹Vander Voort Consulting L.L.C.

11:00 AM Invited

Three Strikes Your Out: Shutting Down the Argument on Poor Fastener Quality: *Michael Connelly*¹; ¹Casey Products Inc

11:20 AM

Advanced Microstructural Classification: How Machine Learning Can Support Us in Metallographic Practice: *Dominik Britz*¹; Jessica Gola¹; Frank Muecklich¹; ¹Saarland University

11:40 AM

Difficulties Using Standard Chart Methods for Rating Non-metallic Inclusions: *George Vander Voort*¹; ¹Vander Voort Consulting L.L.C.

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

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

Monday AM

October 15, 2018

Room: A120

Location: Greater Columbus Convention Center

Session Chair: Amjad Almansour, NASA Glenn Research Center

8:00 AM

Beta-silicon Carbide Powders from Continuous Electro-thermal Processing: *Jeff Vervlied*¹; ¹Superior Graphite

8:20 AM

Fabricating Mesoporous Silicon Carbide Ceramics via Block-Copolymer Soft Templates: *Lisa Rueschhoff*¹; Luke Baldwin²; Robert Wheeler²; John Berrigan³; Matthew Dalton³; Hilmar Koerner³; Michael Cinibulk³; Matthew Dickerson³; ¹National Research Council Research Associate ; ²UES, Inc.; ³Air Force Research Laboratory

8:40 AM

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

9:00 AM

Additive Manufacturing of SiC Using the Binder Jetting Method: Chuyuan Zheng¹; Jung Kun Lee¹; *Ian Nettleship*¹; ¹University of Pittsburgh

9:20 AM

Optimizing the Rheology of Ceramic Suspensions for Direct-write Additive Manufacturing of Advanced Armor Ceramics: *Carli Moorehead*¹; Ryan Dunn¹; Nicholas Ku¹; Lionel Vargas-Gonzalez¹; ¹US Army Research Lab

9:40 AM

Rapid Field-assisted Sintering of UHTC Solid Solution Nanopowders: Paniz Foroughi¹; Andriy Durygin¹; *Zhe Cheng*¹; ¹Florida International University

10:00 AM Break

10:20 AM

Study on the Technology about Preparation of Al₂O₃-based Cermet by Oxidation-Sintering Process: *Yihan Liu*¹; ¹Northeastern University

10:40 AM

Synthesis and Characterization of W-TiC Nanocomposite Powders Produced via Selective Metallothermic Reactions: *Ryan Dempsey*¹; David Lipke²; ¹Missouri S&T; ²Missouri University of Science and Technology

11:00 AM

Synthesis of a Two-component Carbosilane System for the Modular Production of Polymer-derived Ceramics: *Luke Baldwin*¹; Lisa Rueschhoff²; Hilmar Koerner³; Matthew Dalton³; Matthew Dickerson⁴; ¹UES Inc; ²NRC ; ³Air Force Research Labs; ⁴Air Force Research Laboratory

11:20 AM

Low-temperature Treatment of Commercial Pre-ceramic Polymers and Its Effect on the Processing of Non-oxide Ceramic Fibers and Ceramic Matrix Composites: *Zlatomir Apostolov*¹; Heather Chaput²; Elizabeth Heckman³; Michael Cinibulk¹; ¹Air Force Research Laboratory; ²UTC Corp.; ³Wright State University

11:40 AM

Laser Shock Processing of Structural Ceramics: *Bai Cui*¹; Fei Wang¹; Xueliang Yan¹; Chenfei Zhang¹; Leimin Deng¹; Yongfeng Lu¹; Michael Nastasi¹; ¹University of Nebraska-Lincoln

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

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

Monday AM

October 15, 2018

Room: A122

Location: Greater Columbus Convention Center

Session Chair: John Blendell, Purdue University

8:00 AM Invited

In-situ Characterization of the Thermal Degradation of LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ Cathode Materials for Lithium Ion Batteries: *Eric Stach*¹; Sooyeon Hwang²; Khim Karki³; Stanley Whittingham⁴; Guangwen Zhou⁴; ¹University of Pennsylvania; ²Brookhaven National Laboratory; ³Hummingbird Scientific; ⁴Binghamton University



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8:40 AM

Characterization of Platinum/Gamma-alumina Interfaces Combining Transmission Electron Microscopy and Density Functional Theory: Arielle Clauser¹; Kofi Oware Sarfo¹; Colin Ophus²; Raquel Giulian³; Liney Árnadóttir¹; *Melissa Santala*¹; ¹Oregon State University; ²Lawrence Berkeley National Laboratory; ³Universidade Federal do Rio Grande do Sul

9:00 AM

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

9:20 AM

Extreme Thermal Stability in Ternary Nanocrystalline Cu-Zr-Hf and Cu-Zr-Al Alloys with Amorphous Complexions: *Charlette Grigorian*¹; Timothy Rupert¹; ¹University of California, Irvine

9:40 AM

Grain Boundary Structure Characterization with the Smooth Overlap of Atomic Positions Descriptor: *Jonathan Priedeman*¹; Conrad Rosenbrock¹; Oliver Johnson¹; Eric Homer¹; ¹Brigham Young University

10:00 AM Break

10:20 AM Invited

Computational Study of Chemistry on Surfaces and Interfacial Structures: *Peilin Liao*¹; ¹Purdue University

10:50 AM Invited

Impact of Electric Fields on Grain Boundary Core Structures in SrTiO₃ Bicrystals: *Lauren Hughes*¹; Klaus Van Benthem¹; ¹University of California, Davis

11:20 AM

A Phase-field Investigation of the Stabilization of Intermetallic Precipitates through Heterophase Interface Segregation: *Sourabh Kadambi*¹; Srikanth Patala¹; ¹North Carolina State University

11:40 AM

Grain Boundary Manipulation in Directionally Solidified Bicrystals: *Logan Ware*¹; Daniel Suzuki¹; Andrew Catalanotto²; Zachary Cordero¹; ¹Rice University; ²University of Texas at Tyler

International Symposium on Ceramic Matrix Composites — Processing and Microstructure Evolution

Program Organizers: Jitendra Singh, Retired, U.S. Army Research Laboratory; Narottam Bansal, National Aeronautics and Space Administration; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

Monday AM
October 15, 2018

Room: A114
Location: Greater Columbus Convention Center

Session Chair: Raj Singh, Oklahoma State University

8:00 AM Invited

Current Trends and Future Prospects for Ceramic Matrix Composites: *Raj Singh*¹; ¹Oklahoma State University

8:40 AM

Development of Low Temperature, Dense Composite Material Using a Hybrid Deposition Technique: *Sumit Bhattacharya*¹; Abdellatif Yacout²; ¹Argonne National Laboratory; ²Argonne National laboratory

9:00 AM Invited

Pre-ceramic Polymers for Enhanced Processing and Improved Properties of Ceramic Matrix Composites: *Zlatomir Apostolov*¹; Matthew Dickerson¹; Thomas Key²; Luke Baldwin²; Lisa Rueschhoff¹; Michael Cinibulk¹; ¹Air Force Research Laboratory; ²UES Inc.

9:40 AM

Scalable Measurements of Tow Architecture Variability in Braided Ceramic Composite Tubes: *Frederick Heim*¹; Brendan Croom¹; Clifton Bumgardner¹; Xiaodong Li¹; ¹University of Virginia

10:00 AM Break

10:20 AM

Advanced Environmental Barrier Coatings for SiC CMCs: *Larry Fehrenbacher*¹; ¹Technology Assessment & Transfer Inc.

10:40 AM

Microstructural Evolution of Silicate-based Environmental Barrier Coatings in Combustion Environments: *Mackenzie Ridley*¹; Elizabeth Opila¹; Robert Golden²; ¹University of Virginia; ²Rolls-Royce

11:00 AM

Study on Structure and Thermal Stability of Ferrite Cermets: *Yihan Liu*¹; ¹Northeastern University

International Symposium on Defects, Transport and Related Phenomena — Defect Formation and Properties

Program Organizers: Tatsuya Kawada, Tohoku University; Manfred Martin, RWTH Aachen University; Sangtae Kim, University of California, Davis; William Chueh, Stanford University

Monday AM
October 15, 2018

Room: B242/243
Location: Greater Columbus Convention Center

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

8:00 AM Invited

Oxygen Point Defect Formation and Migration in Ruddlesden-Popper Phases: *Dane Morgan*¹; Shenzhen Xu²; Ryan Jacobs¹; Wei Xie³; Dongkyu Lee⁴; Ho-Nyung Lee⁵; ¹University of Wisconsin; ²Princeton University; ³University of CA, Berkeley; ⁴University of South Carolina; ⁵Oak Ridge National Laboratory

8:40 AM Invited

Polaron Size and Shape Effects on Oxygen Vacancy Interactions in Lanthanum Strontium Ferrite: *Yue Qi*¹; Tridip Das¹; Jason Nicholas¹; ¹Michigan State University

9:20 AM

Structurally Driven Magnetic Disorder in Entropy Stabilized Oxides: *Peter Meisenheimer*¹; John Heron¹; ¹University of Michigan

9:40 AM

Thermodynamic Analysis of Oxygen Vacancy Formation in Perovskite Type Oxides for Solar Thermochemical Cycles: *Ryo Hishinuma*¹; Keiji Yashiro¹; Tatsuya Kawada¹; ¹Tohoku University

10:00 AM Break

10:20 AM

Phase Equilibria and Defect Chemistry of Cu₂ZnSnS₄: *Pinwen Guan*¹; ShunLi Shang¹; Greta Lindwall¹; Timothy Anderson¹; Zi-Kui Liu¹; ¹Pennsylvania State University

MONDAY AM

10:40 AM Invited

Melting Mechanisms of Alkali Metasilicate Crystals: The Role of Point Defects: *Alastair Cormack*¹; ¹Alfred University

11:20 AM Invited

Solid-state NMR Study on Hydration Mechanism in Perovskite-type Protonic Conductors: *Iaru Oikawa*¹; *Hitoshi Takamura*¹; ¹Tohoku University

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

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

Monday AM
October 15, 2018

Room: C171
Location: Greater Columbus Convention Center

Session Chair: Boian Alexandrov, Ohio State University

8:00 AM Invited

The Holy Grail of Welding: The Perfect Weldability Test: *John Lippold*¹; ¹Ohio State University

8:30 AM Invited

Use of Modeling Tools for Controlling Weld Microstructure and Properties: *John DuPont*¹; ¹Lehigh University

9:00 AM Invited

Welding and Joining at Microscale and Nanoscale: A Perspective: *Norman Zhou*¹; ¹University of Waterloo

9:30 AM Invited

The Intercritical Heat-affected Zone of Steel Welds: *Leijun Li*¹; ¹University of Alberta

10:00 AM Break**10:20 AM Invited**

Materials Quality Assurance of Welded and 3D-Printed Structures: *Stephen Liu*¹; ¹Colorado School of Mines

10:50 AM Invited

Process Based Qualification Components Made by Welding and Additive Manufacturing: *Sudarsanam Babu*¹; ¹The University of Tennessee, Knoxville

11:20 AM Invited

Laser Additive Manufacturing of Grade 91 F/M Steel: *Thomas Lienert*¹; ¹Los Alamos National Laboratory

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

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

Monday AM
October 15, 2018

Room: B130
Location: Greater Columbus Convention Center

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

10:20 AM

3D Sand Printed Tooling Surface Features and Their Effect on the Fatigue Behavior of Aluminum Castings: *Caitlyn Rodomsky*¹; *Kip Woods*²; *Jason Walker*¹; *Gerard Thiel*²; *Brett Conner*¹; ¹Youngstown State University; ²University of Northern Iowa

10:40 AM

Modeling Precipitation of Strengthening Phases and Mechanical Properties of Cast Aluminum Alloys: *Emre Cinkilic*¹; *Xinyan Yan*²; *Alan Luo*¹; ¹Ohio State University; ²Alcoa Technical Center, LLC

11:00 AM

A Study of the Effect of Rotary Electromagnetic Stirring on the Solidification Microstructure of Aluminum Alloys: *Mohammad Mahdi Aboutalebi*¹; *Mihaiela Isac*¹; *Roderick Guthrie*¹; ¹McGill Metals Processing Centre (MMPC)

11:20 AM

Numerical Simulation and Pilot Scale Horizontal Single Belt Casting Experiments Used for the Production of Thin Strips of AA6111: *Mianguang Xu*¹; *Mihaiela Isac*¹; *Roderick Guthrie*¹; ¹McGill Metals Processing Center, McGill University

11:40 AM

Computational Study and Microstructural Analysis of AA2024 Strips Processed via the Horizontal Single Belt Casting Technique: *Justin Lee*¹; *Roderick Guthrie*¹; *Mihaiela Isac*¹; ¹MMPC, McGill University

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

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

Monday AM
October 15, 2018

Room: B230
Location: Greater Columbus Convention Center

Session Chair: Dimitry Sediako, University of British Columbia

8:00 AM Keynote

Assessing the Corrosion Resistance of Aluminum Alloys for Real-world Marine Environment Exposure: *Kevin Anderson*¹; *Christopher Misorski*¹; ¹Brunswick-Mercury Marine

8:30 AM

Ductile Tearing Fracture Mechanics for Sub-millimeter Al Sheets: *Wade Lanning*¹; *Syed Javaid*¹; *Camilla Johnson*¹; *Christopher Muhlstein*¹; ¹Georgia Institute of Tech



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8:50 AM

Effect of Confined Rolling on Microstructure and Mechanical Properties of Magnesium Alloys: *Pavitra Krishnan*¹; Laszlo Kecskes²; Tomoko Sano²; Qiuming Wei³; ¹University of North Carolina Charlotte; ²WMRD, US ARL, APG; ³UNCC

9:10 AM

The Effects of Pre-heating on Nugget Growth and Weldability for Resistance Spot Welding of A6014 Alloy: *Joo Yong Cheon*¹; Changwook Ji¹; Jae Hun Kim¹; Oksu Kim¹; Byungchul Cha¹; ¹Korea Institute of Industrial Technology

9:30 AM

Properties of Various Phases in Al Powertrain Alloys: A Review: *Ermia Aghaie*¹; Dimitry Sediako¹; ¹University of British Columbia-Okanagan

9:50 AM

Residual Strain Characterization of an Advanced Aluminum Marine Alloy Using In-situ Neutron Diffraction: *Joshua Stroh*¹; Dimitry Sediako¹; ¹UBC Okanagan

10:10 AM Break

10:30 AM Keynote

Microstructure: Phases and Morphologies: Domonkos Tolnai¹; Serge Gavras¹; R. H. Buzolin²; *Norbert Hort*¹; ¹Magnesium Innovation Centre, Helmholtz Zentrum Geesthacht; ²Institute of Materials Science, Joining and Forming, Graz University of Technology

11:00 AM

Investigating the Tribological Behaviour of Magnesium-Based Nanocomposites: *Srivatsan Tirumalai*¹; Subramanian. Jayalakshmi²; Singh Arvind²; Manoj Gupta²; ¹Bangalore, India; ²Kumaraguru College of Technology

11:20 AM

Corrosion Performance of Warm-formed Automotive Heat Exchanger Components: *Michael Benoit*¹; Sooky Winkler²; Mary Wells³; Carolyn Hansson¹; ¹University of Waterloo; ²Dana Canada Corporation; ³University of Guelph

11:40 AM

The Effect of an Al-Ti Grain Refiner on Hot Tearing of AZ91D Mg Alloy: *Tyler Davis*¹; Lukas Bichler¹; ¹University of British Columbia

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

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

Monday AM
 October 15, 2018

Room: D183
 Location: Greater Columbus Convention Center

Session Chair: Michael Tonks, University of Florida

8:00 AM Invited

Embrittlement of RPV Surveillance Welds Irradiated up to High Fluence over a Wide Range of Flux: *G. Robert Odette*¹; Randy Nanstad²; Nathan Almirall¹; Peter Wells¹; Takuya Yamamoto¹; ¹University of California Santa Barbara; ²Oak Ridge National Laboratory

8:40 AM

Oxidation Behavior of Zr-alloy Cladding Candidates for the TREAT Reactor LEU Fuel Core: *Jordan Vandegriff*¹; Patrick Price¹; Darryl Butt¹; Clemente Parga²; Ben Coryell²; Brian Jaques¹; ¹Boise State University; ²Idaho National Laboratory

9:00 AM

Advanced Manufacturing of Ferritic Martensitic Steels for Fuel Cladding: Ducts and Wrappers: *Niyanth Sridharan*¹; Kevin Field¹; ¹Oak Ridge National Laboratory

9:20 AM

Effects of Surface Treatments and Finishes on the High Temperature Oxidation Behavior of Alloy 800: *Richard Chiang*¹; Sebastien Teysseyre²; Vivekanand Kain³; Seetha Mannava¹; Vijay Vasudevan¹; ¹University of Cincinnati; ²Idaho National Laboratory; ³Bhabha Atomic Research Centre

9:40 AM

Microstructural Evaluations of Ion and Neutron Radiation Damage in MAX Phase Alloys: Can Ion Beams Emulate Neutron Damage?: Mathews Tunes¹; Stephen Donnelly¹; *Philip Edmondson*²; ¹University of Huddersfield; ²Oak Ridge National Laboratory

10:00 AM

The Effects of Ultrasonic Nanocrystal Surface Modification on Residual Stress, Microstructure and Mechanical Properties of Alloy 600 and Alloy 690: *Harsha Venkat Sai Naralasetty*¹; Auezhan Amanov²; Young Shik Pyoun²; Nicholas Mohr³; Jonathan Tatman³; Ben Sutton³; Greg Frederick³; Seetha Mannava¹; Vijay Vasudevan¹; ¹University of Cincinnati; ²Sun Moon University; ³Electric Power Research Institute

Materials Issues in Nuclear Waste Management — Nuclear Waste Form Processing and Synthesis I

Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Jason Loneragan, Washington State University; Jake Amoroso, Savannah River National Laboratory; Yutai Katoh, Oak Ridge National Laboratory; Kevin Fox, Savannah River National Laboratory; Josef Matyas, Pacific Northwest National Laboratory

Monday AM
 October 15, 2018

Room: D282
 Location: Greater Columbus Convention Center

Session Chair: Kevin Fox, Savannah River National Laboratory

8:00 AM Invited

Application of Metallo-organic Chemistry and Nanotechnology to Issues Faced by the Nuclear Industry: *Allen Applett*¹; ¹Oklahoma State University

8:40 AM

Nepheline Crystal Growth Behavior in High Level Nuclear Waste Glasses: *Devon McClane*¹; Jake Amoroso¹; Kevin Fox¹; Albert Kruger²; ¹Savannah River National Lab; ²US Department of Energy Office of River Protection

9:00 AM Invited

Crystallization of Rare-earth Containing Phases in Molybdenum-containing Alumino-boro-silicate Glasses: *John McCloy*¹; Deepak Patil²; Muad Saleh²; Mostafa Ahmadzadeh²; Brian Riley³; Jarrod Crum³; Ashutosh Goel⁴; Hrishikesh Kamat⁴; Kristian Barnsley⁵; John Hanna⁵; Prashant Rajbhandari⁶; Russell Hand⁶; Neil Hyatt⁶; ¹Washington State University; ²Washington State University; ³Pacific Northwest National Laboratory; ⁴Rutgers University; ⁵Warwick University; ⁶University of Sheffield

9:40 AM

Nuclear and Environmental Technology Division – Outstanding Student Research Award (NETD-OSR Award): Bismuth Aluminoborosilicate Glass Binders for Sintered and Vitrified High-level Waste Salt Immobilization: *Levi Gardner*¹; Manish Wasnik¹; Michael Simpson¹; Krista Carlson¹; ¹University of Utah

MONDAY AM

10:00 AM Break**10:20 AM Invited**

Waste Forms: Can We Design Durable Materials and Predict Performance over Geologic Time Scales?: *Eric Pierce*¹; Jeremy Eskelsen¹; Michelle Chiu¹; ¹Oak Ridge National Laboratory

11:00 AM

Contributions to Enhanced Waste Glasses for the Hanford Waste Treatment and Immobilization Plant: *Kevin Fox*¹; Devon McClane¹; Jake Amoroso¹; Mark Fowley¹; Albert Kruger²; ¹Savannah River National Lab; ²US Department of Energy Office of River Protection

11:20 AM

Review of Sorbent Materials for Ocean Mining of Uranium: *Allen Aplett*¹; Cory Perkins¹; ¹Oklahoma State University

Materials Property Understanding through Characterization — Novel Characterization Techniques

Program Organizers: Indrajit Dutta, Corning Incorporated; Nicholas Smith, Corning Incorporated

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

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

8:00 AM Invited

3D Porosity Analysis of Collagen-hydroxyapatite Coatings for Hard Tissue Replacement: *Tomas Silva Santisteban*¹; Le Yu²; Mei Wei²; ¹Thermo Fisher Scientific; ²University of Connecticut

8:40 AM Invited

Connecting Structure and Properties of Amorphous Ceramics Using 4-dimensional Scanning Transmission Electron Microscopy: *Menglin Zhu*¹; Soohyun Im¹; Ridwan Sakidja²; Nathan Oyler³; Michelle Paquette³; Paul Rulis³; Jinwoo Hwang¹; ¹Ohio State University; ²Missouri State University; ³University of Missouri Kansas City

9:20 AM

Quantifying Spread in Crystallographic Textures Due to Stochasticity in Deformation Processes: *Mustafa Rifat*¹; Saurabh Basu²; ¹Penn State University; ²Penn State

9:40 AM Invited

Determining Sensitivities of Various Forming Limit Analyses Techniques to Changes in Experimental Parameters: *Dilip Banerjee*¹; Mark Iadicola¹; ¹National Institute of Standards and Technology

10:20 AM Break**10:40 AM**

Predictive Hardness Modeling of Materials: *Hongyeun Kim*¹; Shunli Shang¹; Laszlo Kecskes²; Zi-Kui Liu¹; ¹Penn State University; ²Matsys

Materials Science and Engineering of Earth Abundant Materials — Materials Science and Engineering of Earth Abundant Materials

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

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

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

8:00 AM Invited

Bio-inspired Catalysts from Earth Abundant Materials for the Conversion of CO₂ to Fuel and Chemicals: *Nora De Leeuw*¹; ¹Cardiff University

8:40 AM

NMR Characterization of MgO Engineered Barrier Materials: *Jessica Rimsza*¹; Eric Sorte²; Todd Alam²; ¹Geochemistry Department, Sandia National Labs; ²Organic Materials Science, Sandia National Laboratories

9:00 AM Invited

An Atomic-scale Analysis and Thermodynamic Assessment of the First Ceramics Formed in the Solar System: *Thomas Zega*¹; Venkat Manga¹; Krishna Muralidharan¹; Fred Ciesla²; Keitaro Watanabe³; Hiromi Inada³; ¹University of Arizona; ²University of Chicago; ³Hitachi High Technologies

9:40 AM

V-segregation at (111) Twins in MgAl₂O₄-spinel: A First-principles Study: *Venkateswara Manga*¹; Thomas Zega¹; Prajкта Mane¹; Tarunika Ramprasad¹; Keith Runge¹; Krishna Muralidharan¹; ¹University of Arizona

10:00 AM Break**10:20 AM**

Microstructural Behaviour of Ti₆Al₄V during Room Temperature Deformation: *Gajanan Kulkarni*¹; ¹Bharat Forge LTD

10:40 AM

Selection of Aluminum Alloy for Casting Defectless Thermoforming Molds Using Green Sand Foundry Technology: An Experimental Approach: *Abdullah Al Shafe*¹; Sabila Kader Pinky²; Cynthia K. Waters¹; ¹North Carolina A&T State University; ²Missouri State University

Multifunctional Ceramic- and Metal-matrix Composites: Processing, Microstructure, Properties and Performance — Novel Composite Materials

Program Organizers: Martin Pech-Canul, Cinvestav IPN Saltillo; Golam Newaz, Wayne State University; Xiaoming Wang, Purdue University

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

Session Chair: Martin Pech-Canul, Cinvestav IPN Saltillo

8:00 AM Invited

A Novel Micro/Nano Multi-scaled Cermet with Simultaneously High Hardness/Toughness: *Guan-Jun Yang*¹; ¹Xi'an Jiaotong University

8:30 AM

On the Design of Novel MAX Reinforced Ni-matrix Composites: *Maharshi Dey*¹; Matt Fuka¹; Surojit Gupta¹; ¹University of North Dakota



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8:50 AM

Multiscale Study of Mechanical Properties of Composite Metal Nano-foams: Andres Jimenez¹; Hang Ke¹; Cetin Cetinkaya¹; David Bahr²; Ioannis Mastorakos¹; ¹Clarkson University; ²Purdue University

9:10 AM Invited

Rolling Behaviour of Aluminum Alloy 2014-10wt% SiCp Metal Matrix Composites: Ajay Kumar P.¹; Gajendra Dixit²; Aruna Patel³; Satyabrata Das⁴; ¹University of Wisconsin-Milwaukee, Materials Department; ²Maulana Azad National Institute of Technology, Bhopal; ³Advanced Materials and Processes Research Institute (CSIR, New Delhi), Bhopal; ⁴Indian Institute of Technology, Kanpur

9:30 AM

Processing and Properties of Engineered Metal Matrix Composites Produced Via Co-Extrusion: Paul Brune¹; Jeremy Watts¹; Greg Hilmas¹; ¹Missouri University of Science and Technology

9:50 AM

Characterisation and Mechanical Properties of Stainless Steel Matrix Composites Reinforced with (Nb_xTi_{1-x})C Particles: Wen Hao Kan¹; Vijay Bhatia¹; Zijian Yu¹; Yong Jang¹; Kevin Dolman²; Xinhua Tang²; Timothy Lucey²; Li Chang¹; Gwénaëlle Proust¹; Julie Cairney¹; ¹University Of Sydney; ²Weir Minerals Australia Ltd.

10:10 AM Break

10:30 AM

Hybrid Aluminum Matrix Composites (HAMCs) Using Powder Metallurgy Method: AHM Rahman¹; Issam Abu-Mahfouz¹; Imran Zakir¹; ¹Penn State Harrisburg

10:50 AM

Stochastic Modeling of the Effects of Structural Randomness on the Mechanical Behavior of Discontinuous Fiber-reinforced Composites: Revealing the Role of Network Coordination State: Mujan Seif¹; Mary Martin¹; Dorothy Richardson²; Matthew Turner¹; Thomas Balk¹; Matthew Beck¹; ¹University of Kentucky; ²Northeastern University

11:10 AM Invited

Fabrication of High-property Graphene Reinforced Aluminum Alloy Composite by Powder Metallurgy Combined with Friction Stir Processing: Zongyi Ma¹; Zhanwei Zhang¹; Zhenyu Liu¹; Bolu Xiao¹; ¹Institute Of Metal Research Chinese Academy of Sciences

11:30 AM

Comparative Assessment of Delamination control techniques in Conventional drilling of CFRP: Kamlesh Phapale¹; ¹Bharat Forge Ltd

Neutron and Synchrotron Techniques for Advanced Materials Characterization — Advanced Neutron & Synchrotron Techniques

Program Organizers: Helen Playford, ISIS Facility; Lewis Owen, University of Cambridge

Monday AM

October 15, 2018

Room: B246

Location: Greater Columbus Convention Center

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

8:00 AM

Comparing Laboratory X-ray and Neutron Methods of Diffraction-based Stress Measurements: Adam Creuziger¹; Thomas Gnaeupel-Herold²; Chris Calhoun²; ¹National Institute of Standards & Technology; ²National Institute of Standards & Tech

8:20 AM

Identification of Orientation Relationships in Metallic Polycrystals with Neutron Diffraction: Joe Kelleher¹; ¹Engin-X, ISIS, STFC

8:40 AM

Examining Deformation Mechanisms in Al-Cu Alloys with In-situ Neutron Diffraction: Brian Milligan¹; Dong Ma²; Amit Shyam²; Amy Clarke³; Lawrence Allard³; Francisco Coury³; ¹Oak Ridge National Laboratory; ²Oak Ridge National Lab; ³Colorado School of Mines

9:00 AM

In-situ Characterisation of the Thermomechanical Deformation Behaviour of Ni-based Superalloys: Katerina Christofidou¹; Nick Jones¹; Mark Hardy²; Howard Stone¹; ¹University of Cambridge; ²Rolls-Royce plc.

9:20 AM

An In-situ Small-angle Synchrotron X-ray Scattering Study of Microstructural Evolution in a Ni-based Alloy: Govindarajan Muralidharan¹; Dean Pierce¹; Joseph Serio¹; Ross Andrews²; Matthew Frith²; Jan Ilavsky²; Saul Lapidus²; ¹Oak Ridge National Laboratory; ²Argonne National Laboratory

9:40 AM

Intra-granular Strain Sensitivity in Near-field High Energy Diffraction Microscopy: Yu-Feng Shen¹; He Liu¹; Robert Suter¹; ¹Carnegie Mellon University

10:00 AM Break

10:20 AM

Recent Upgrades to the Residual Stress Diffractometer HB2B at the High Flux Isotope Reactor: Jeffrey Bunn¹; Chris Fancher¹; Andrew Payzant¹; Barton Bailey¹; Paris Cornwell¹; ¹Oak Ridge National Laboratory

10:40 AM

Near-surface Elemental Analysis of Solids by Neutron Depth Profiling: Jamie Weaver¹; Gregory Downing¹; ¹National Institute of Standards and Technology

11:00 AM

In-situ Quasi-elastic Neutron Scattering Study on the Water Dynamics during Formation of Sustainable Cements: Kai Gong¹; Yongqiang Cheng²; Luke Daemen²; Claire E. White¹; ¹Princeton University; ²Oak Ridge National Laboratory

11:20 AM

Pair Distribution Function Computed Tomography Analysis of the Local Atomic Structure of Carbonated Alkali-activated Slag Paste: Eric McCaslin¹; Claire White¹; ¹Princeton University

MONDAY AM

11:40 AM

X-ray and Neutron Pair Distribution Function Studies of Ferroelectric Nanocrystals: *Tedi-Marie Usher-Ditzian*¹; Daniel Olds¹; Jue Liu¹; Katharine Page¹; ¹Oak Ridge National Laboratory

Next Generation Biomaterials — Biomaterials I

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

Monday AM

October 15, 2018

Room: D182

Location: Greater Columbus Convention Center

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

8:00 AM Invited

Additive Manufacturing of Low Modulus β -Titanium Alloys for Implants: Srinivas Aditya Mantri¹; Eugene Ivanov²; *Rajarshi Banerjee*¹; ¹University of North Texas; ²Tosoh SMD Inc

8:20 AM Invited

Advanced Tissue Engineering Scaffolds for Postoperative Cancer Patients: *Min Wang*¹; ¹The University of Hong Kong

8:40 AM Invited

Bouncy Bioglass for Osteochondral Regeneration: *Julian Jones*¹; ¹Imperial College London

9:00 AM

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

9:20 AM Invited

Effects of Protein Corona Decoration on Oxide Nanoparticles for Medical Diagnosis and Treatment: Jian Zhao¹; Shengming Wu¹; Yilong Wang²; *Donglu Shi*²; ¹Qingdao University of Science & Technology; ²Tongji University School of Medicine; ³Tongji University School of Medicine & University of Cincinnati

9:40 AM

The Complexity of Chemistry, Physiology, Anatomy and Bone Structure for Bioceramic Implants: *Thomas McGee*¹; ¹Osteoceramics, LLC

10:00 AM Break

10:20 AM Invited

Structure/Property Relationships in Biomaterials at the Nanoscale: *Federico Rosei*¹; ¹INRS Centre for Energy, Matls & Telecommunications

10:40 AM Invited

Synthetic Bone Grafting Materials Used in Orthopedics: *Steven Jung*¹; ¹Mo-Sci Corporation

11:00 AM Invited

Calcium Phosphate based 3D Printed Scaffolds and Coatings for Treatment of Bone Disorders: *Susmita Bose*¹; Amit Bandyopadhyay¹; ¹Washington State University

11:20 AM Invited

Engineered Nanomaterials with New “Touch and Kill” Mechanism to Fight Bacteria and Bacteria Resistance: *Tolou Shokuhfar*¹; ¹University of Illinois at Chicago

11:40 AM Invited

Bioinspired Design of Next Generation Structural and Thermal Materials: *Nima Rahbar*¹; ¹Worcester Polytechnic Institute

Perspectives for Emerging Materials Professionals — Session I

Program Organizers: Andrew Frerichs, The NanoSteel Company; Dharma Maddala, Arconic Technology Center

Monday AM

October 15, 2018

Room: B231

Location: Greater Columbus Convention Center

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

8:00 AM Invited

Researching for a Mission: *Shawn Coleman*¹; ¹U.S. Army Research Laboratory

8:20 AM Invited

The Professor Is In: My Transition from Graduate Student to Assistant Professor: *Ashwin Shahani*¹; ¹University Of Michigan

8:40 AM Invited

The Winding Path to an Exciting Career in a DOD Laboratory: *Billy Hornbuckle*¹; ¹U.S. Army Research Laboratory

9:00 AM Invited

A Perspective: Working at a National Laboratory: *Elizabeth Hoffman*¹; ¹Savannah River National Laboratory

9:20 AM Invited

From College to Career: Preparing Yourself for Life in Industry: *William Podrazky*¹; ¹Hitachi High Technologies America, Inc.

9:40 AM Invited

Making a Career Out of the Unknown: *Brett Leister*¹; ¹Exponent, Inc.

10:00 AM Break

10:20 AM Invited

Studying Technology to Predict the Future of the Materials Science and Engineering Discipline: Career Planning: *David Furrer*¹; ¹Pratt & Whitney

10:40 AM Panel Discussion

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

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

Monday AM

October 15, 2018

Room: A125

Location: Greater Columbus Convention Center

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

8:00 AM Invited

Microstructure and Microtexture of Induction Sintered Copper-based Powder Metal Parts: *Daudi Waryoba*¹; ¹Pennsylvania State University



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Innovative Gas Hydrate Decomposition Method by Electromagnetic Wave Irradiation of UHF to S Band: *Shin Nakatani*¹; Motoyasu Sato¹; Masao Yukumoto¹; Motohiko Tanaka¹; ¹Chubu University

9:20 AM

One-dimension Magnetolectric Gyrtator: Power Conversion: *Xin Zhuang*¹; Chung-ming Leung²; Jiefang Li²; Dwight Viehland²; ¹Virginia Polytechnic Institute; ²Virginia Tech

9:40 AM

Viscous Flow Mediated Spark Plasma Sintering of Iron Based Amorphous Alloy: *Tanaji Paul*¹; Sandip Harimkar¹; ¹Oklahoma State University

10:00 AM Break

10:20 AM

Morphology Effect of Oxide Particles for Microwave Applications: *Christina Wildfire*¹; Terence Musho²; Edward Sabolsky²; Dushyant Shekhawat³; Robert Tempke²; ¹National Energy Technology Laboratory; ²West Virginia University; ³NETL

10:40 AM

Laser Soldering Process for Manufacturing Camera Module: *Heeshin Kang*¹; Jiwhan Noh¹; ¹Korea Institute of Machinery & Materials

PSDK XIII: Phase Stability and Diffusion Kinetics — Gibbs Award Session I

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

Monday AM
October 15, 2018

Room: A213
Location: Greater Columbus Convention Center

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

8:00 AM Keynote

High Temperature Corrosion Kinetics and the P-Pt-Rh Phase Diagram: Anna Nakano¹; Jinichiro Nakano¹; James Bennett²; *John Morral*³; ¹U.S. Department of Energy National Energy Technology Laboratory; AECOM; ²U.S. Department of Energy National Energy Technology Laboratory; ³The Ohio State University

8:40 AM Invited

Thermodynamic Calculation of Aqueous Phase Diagrams: *Arthur Pelton*¹; Gunnar Eriksson²; Klaus Hack²; Christopher Bale¹; ¹Ecole Polytechnique; ²GTT-Technologies

9:00 AM Invited

Ocean of Data for Materials: High Throughput Modeling of Multi-component Systems: *Zi-Kui Liu*¹; ¹Pennsylvania State University

9:20 AM Invited

Accessible Diffusion Data: Challenges and Opportunities: *Carelyn Campbell*¹; Greta Lindwall²; ¹National Institute of Standards & Tech; ²Royal Institute of Technology (KTH)

9:40 AM Invited

CALTPP: A General Program to Calculate Thermophysical Properties: *Yong Du*¹; Zhoushun Zheng¹; Cong Zhang²; Yuling Liu¹; Changfa Du¹; Shuhong Liu¹; ¹Central South University; ²University of Science and Technology Beijing

10:00 AM Break

10:20 AM Invited

Efficient Exploration of the High Entropy Space: *Raymundo Arroyave*¹; ¹Texas A & M University

10:40 AM Invited

Experimental Determination of Phase Diagrams and Diffusion Coefficients: The Ins and Outs: *Ji-Cheng Zhao*¹; ¹Ohio State University

11:00 AM Invited

Interdiffusion and Phase-equilibria Studies in Multi-principal Element Alloys: *Kaustubh Kulkarni*¹; A. Bhargava Krishna²; ¹Indian Institute of Technology Kanpur; ²Iit Kanpur

Rare Earth Metals and Critical Materials: Synthesis, Processing, Production, Recent Advances — Rare Earth Metals - Mining and Extraction

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

Monday AM
October 15, 2018

Room: B131
Location: Greater Columbus Convention Center

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

8:00 AM Invited

Rare Earth Elements from Coal and Coal-based Resources: *Mary Anne Alvin*¹; ¹National Energy Technology Laboratory

8:40 AM Invited

Rare Earth Mining Outside of China: The Current Landscape of Operating Mines and Known Deposits: *Roderick Eggert*¹; ¹Colorado School Of Mines

9:20 AM Invited

Beneficiation of Rare Earths: *Corby Anderson*¹; ¹Colorado School of Mines

10:00 AM Break

10:20 AM Invited

Reduction of Rare Earth Elements through Electrochemical, Metallothermic, and Arc Furnace Methods: A Review: *Patrick Taylor*¹; Matt Earlam²; Fangyu Liu¹; ¹Colorado School of Mines; ²Infinium

11:00 AM

Rare Earth Salts: A Breakthrough Separation Technology for Rare Earths: *Alastair Neill*¹; ¹Rare Earth Salts

11:30 AM Invited

The Use of Centrifuge Technology for Treatment of Crud and Fine Particles in Mineral Processing: Marc Janson¹; *Derek Ettie*¹; ¹GEA Mechanical Equipment US, Inc.

MONDAY AM

Responsive Functional Nanomaterials — Multi-functional Nanosensors

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

Monday AM
October 15, 2018

Room: D181
Location: Greater Columbus Convention Center

Session Chair: Weiyang Li, Dartmouth College

8:00 AM

Surface Interactions on Nanostructured Metal Oxides for Gas Sensing Applications: *Janine Walker*¹; Sheikh Akbar¹; Patricia Morris¹; ¹The Ohio State University - College of Engineering Department of Materials Science and Engineering

8:20 AM

Investigation of Mechanical Behavior of Ionic Diblock Copolymer, via Molecular Dynamics Simulation: *Mengze Ma*¹; Yao Fu¹; ¹University of Cincinnati

8:40 AM Invited

Preparation of

NiO Nanostucture by Hydrothermal for H₂S Gas Sensor: *Gotan Jain*¹; ¹KTHM College

9:10 AM

Nanocrystalline Electro-chemo-mechanical Actuator Operating at Room Temperature: Eran Mishuk¹; Evgeniy Makagon¹; Sidney Cohen¹; Ellen Wachtel¹; Igor Lubomirsky¹; ¹Weizmann Institute of Science

9:30 AM

Direct fabrication of Graphene-based Strain Gauge on 3D-printed ULTEM: *Roberto Aga*¹; Eric Kreit¹; Carrie Bartsch²; Emily Heckman²; ¹KBRWYLE/Air Force Research Lab; ²AFRL

9:50 AM Break

10:10 AM Invited

Fundamental Understanding and Rational Design of Multifunctional Hydrogels: *Jie Zheng*¹; Yanxian Zhang¹; Baiping Ren¹; ¹University of Akron

10:50 AM

Emerging Piezoelectricity in Two-dimensional Chiral-Chain Van der Waals Tellurene for Energy Harvesting and Sensing: *Shengjie Gao*¹; Yixiu Wang²; Wenzhuo Wu²; ¹Purdue University; ²School of Industrial Engineering, Purdue University

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

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

Monday AM
October 15, 2018

Room: A220
Location: Greater Columbus Convention Center

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

8:00 AM Keynote

Localized Corrosion of Stainless Steel in Effluent Treatment Facility of a Nuclear Waste Processing Operation: *Narasi Sridhar*¹; Sandeep Chawla¹; Kenneth Evans¹; Brandon Rollins¹; John Beavers¹; ¹DNVGL

8:40 AM

Corrosion Risk Factors in Kr-85 Storage Canisters and Implications for Long Term Storage: *Matthew Asmussen*¹; Charles Demarest²; James Neeaway¹; Sean Agnew²; Carolyn Pearce¹; John Scully²; ¹Pacific Northwest National Laboratory; ²University of Virginia

9:00 AM

Corrosion Studies of the Canadian Used Nuclear Fuel Container: *Wilfred Binns*¹; Peter Keech¹; Nick Senior²; ¹NWMO; ²CanmetMATERIALS

9:20 AM

Application of Electrochemical Quartz Crystal Microbalance in Corrosion: *Xueyuan Zhang*¹; ¹Gamry Instruments

9:40 AM

Bond-Energy Models of Alloy Oxides for Corrosion Resistant Alloys: *Szu-Chia Chien*¹; Wolfgang Windl¹; ¹The Ohio State University

10:00 AM Break

10:20 AM

Corrosion Behavior of Spark Plasma Sintered Magnesium in Salt Water: *Somi Doja*¹; Antonia Ciocoiu²; Lukas Bichler²; ¹University of British Columbia; ²Univ of British Columbia

10:40 AM

Corrosion Resistance of an Electric Field Modified Polymer Film: *Zhenliang Feng*¹; Guang-Ling Song¹; Dajiang Zheng¹; ¹Center for Marine Materials Corrosion and Protection, State Key Laboratory of Physical Chemistry of Solid Surfaces, College of Materials, Xiamen University

11:00 AM

Erosion-corrosion of 90° Carbon Steel Elbow in Potash Brine-sand Slurries: *Raheem Elemuren*¹; Richard Eviitts¹; Ikechukwuka Oguocha¹; Akindele Odeshi¹; ¹University of Saskatchewan

11:20 AM

The Role of Alloy Microstructure on the Cavitation Corrosion Behavior of Iron-based, Nickel-based and Cobalt-based Alloys in Seawater: *Hameed Al-Hashem*¹; ¹PRC-KISR

11:40 AM

High-temperature Oxidation of Dissimilar Welds at 982°C: *Joseph Meyer*¹; ¹Haynes International



OCTOBER 14 – 18, 2018
 GREATER COLUMBUS CONVENTION CENTER
 COLUMBUS, OHIO, USA

Sintering and Related Powder Processing Science and Technologies — Sintering and Microstructural Evolution

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

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

Session Chair: Zachary Cordero, Rice University

8:00 AM Invited

Sintering and Grain Boundary Segregation Behavior of Silica and Rare-earth Doped Boron Suboxide Armor Ceramics: *Christopher Marvel*¹; Kristopher Behler²; Jerry LaSalvia³; Martin Harmer¹; ¹Lehigh University; ²U.S. Army Research Laboratory; SURVICE Engineering; ³U.S. Army Research Laboratory

8:40 AM Invited

Solute Segregation and Enhanced Grain Boundary Mobility in Alumina: Ruth Moshe¹; *Wayne Kaplan*¹; ¹Technion - Israel Institute of Technology

9:20 AM

Microstructural Evolution of Al-Cu-Mg Sintered Alloys during Semi-solid Extrusion Process: *M Davidson*¹; Asit Kumar Khanra¹; Katti Bharath¹; ¹National Institute of Tech

9:40 AM

Investigating Anomalous Grain Growth in Calcia and Silica Doped Specialty Alumina: *Christopher Marvel*¹; Kevin Anderson²; Animesh Kundu¹; Martin Harmer¹; Tobias Frueh³; Charles Compson³; ¹GrainBound LLC; Lehigh University; ²Lehigh University; ³Almatis Inc

10:00 AM Break

10:20 AM

Investigation of Li and Ta Addition on Physical and Electrical Properties of KNN Ceramics: *Mehmet Ozmen*¹; Baris Yavas¹; Ipek Akin¹; Onuralp Yucel¹; Filiz Sahin¹; Gultekin Goller¹; ¹Istanbul Technical University Metallurgical and Materials Engineering

10:40 AM

Microstructure Development of Alumina during Liquid Phase Sintering in the CaO-Al₂O₃-SiO₂ System: *Sarah Whipkey*¹; Hyojin Lee¹; William Carty¹; ¹Alfred University

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

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

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

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

8:00 AM Invited

Gradient Theory in Small Scales: *Elias Aifantis*¹; ¹Aristotle University of Thessaloniki

8:20 AM Invited

Absence of Size Effect in a TWIP Steel: Xiaoxue Chen¹; Vincent Hammond²; Laszlo Kecskes²; *Qiuming Wei*³; ¹UNC-Charlotte; ²US ARL; ³University of North Carolina Charlotte

8:40 AM Invited

Size Effects in High-entropy Alloys and Quasicrystals: *Yu Zou*¹; ¹University of Toronto

9:00 AM Invited

Size Effects in Mechanical Properties of Graphene Oxide Nanosheets: *Chandra Veer Singh*¹; ¹University of Toronto

9:20 AM Invited

Size Effects in Microparticle Impact-bonding: Mostafa Hassani-Gangaraj¹; David Veysset¹; Keith Nelson¹; *Christopher Schuh*¹; ¹Massachusetts Institute of Technology

9:40 AM Invited

Size Effects in Static and High Cycle Fatigue Micro-cantilever Tests: *Jicheng Gong*¹; Angus Wilkinson¹; ¹Materials Department, Oxford University

10:00 AM Break

10:20 AM Invited

Indentation Size and Microstructure Effects on Cyclic Deformation in Rare-earth Phosphate Ceramics: *Corinne Packard*¹; ¹Colorado School of Mines

10:40 AM Invited

Nanoindentation of High Purity Vapor Deposited Lithium Films: A Mechanistic Rationalization of Diffusion-mediated Flow: *Erik Herbert*¹; Stephen Hackney¹; Nancy Dudney²; Violet Thole¹; Sudharshan Phani³; ¹Michigan Technological University; ²Oak Ridge National Laboratory; ³International Advanced Research Centre for Powder Metallurgy and New Materials

11:00 AM Invited

Size Effects in FCC Metals: Influence of Temperature and Stacking Fault Energy: Yuan Xiao¹; *Jeffrey Wheeler*¹; ¹Eth Zurich

11:20 AM Invited

Intermittent Plasticity in Microcrystals: Scale-free and Universal?: *Robert Maass*¹; ¹University of Illinois at Urbana Champaign

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

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

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

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

8:00 AM Invited

Use of Diamond Thin Films in Medical Device Applications: *Roger Narayan*¹; ¹University of North Carolina

8:40 AM

Calcium Phosphate Coated Ti for Musculoskeletal Applications: Effect of Aloe Vera Gel Extract Acemannan on Biological Properties: *Dishary Banerjee*¹; Susmita Bose¹; ¹Washington State University

MONDAY AM

9:00 AM

Characterization of Osteoconductive Si-Y-O-N Phase Present at Annealed Silicon Nitride Surface: *Ryan Bock*¹; David Cullen²; Donovan Leonard²; Karren More²; B. Sonny Bal³; Bryan McEntire¹; ¹Amedica Corporation; ²Oak Ridge National Laboratory; ³University of Missouri

9:20 AM Invited

Quantification of Nanoscale Adhesion Force of Staphylococcus Aureus on the Surface of Biomaterials Using Atomic Force Microscopy: *Fahad Alam*¹; *Kantesh Balam*²; ¹Indian Institute of Technology Kanpur; ²Indian Institute of Technology Kanpur

10:00 AM Break

10:20 AM

Effect of Patterned Bioactive Amorphous Silicon Oxynitride and Phosphorus Doped Silicon Oxynitride Coatings on the C2C12 Muscle Cells: *Kamal Awad*¹; Jian Huang¹; Leticia Brotto¹; Pranesh Aswath¹; Marco Brotto¹; Venu Varanasi¹; ¹University of Texas at Arlington

10:40 AM Invited

Evaluation for Immunity of Biomaterials Based on Raman Spectroscopy: *Hideyuki Kanematsu*¹; Yuta Sakagami¹; Dana Barry²; Michiko Yoshitake³; Akiko Ogawa¹; Nobumitsu Hirai¹; Takeshi Kougo¹; Daisuke Kuroda¹; Yoshimitsu Mizunoe⁴; ¹National Institute of Technology, Suzuka College; ²Clarkson University; ³National Institute for Materials Science; ⁴The Jikei University School of Medicine

11:20 AM

Prospect of Hydroxyapatite Powder Produced from Waste Poultry Eggshells for Biomedical Applications: *Alafara Baba*¹; Adeola Womiloju¹; Abdullah Ibrahim¹; Fatimah Abubakar¹; Anoka Njah¹; Folahan Adekola¹; Abdulganiyu Alabi²; ¹University of Ilorin; ²Kwara State University, Malet

11:00 AM

Novel Chemopreventive Agents: Effects of Saffron and Bicarbonate Release from Hydroxyapatite Coated Ti on Osteoblast - Osteosarcoma Cell Proliferation and Viability: *Caitlin Koski*¹; Susmita Bose¹; ¹Washington State University

11:40 AM

Nanostructured Magnesium Implants with Enhanced Biofunctionalization: *TS Sampath Kumar*¹; ¹Indian Institute of Technology Madras

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

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

Monday AM
October 15, 2018

Room: B144/145
Location: Greater Columbus Convention Center

Session Chair: Lan Li, Boise State University

8:00 AM Introductory Comments

8:05 AM Invited

A Simple Mixed Matrix Membrane Fabrication Method with In-situ MOF Growth for Gas Separation: *David Hopkinson*¹; Anne Marti¹; Surendar Venna¹; Jeffrey Culp¹; Elliot Roth¹; ¹Doe/Netl

8:25 AM Invited

Synchrotron Structural Studies of Ni(CN)₄-based Flexible Metal-organic Framework (MOF) Crystals: *Winnie Wong-Ng*¹; Jeffrey Culp²; Yu-Sheng Chen³; Jeffrey Deschamps⁴; Lan Li⁵; ¹National Institute of Standards and Technology; ²NETL; ³The University of Chicago; ⁴Naval Research Laboratory; ⁵Boise State University

8:45 AM Invited

Bio-template Synthesis of Zeolitic Imidazolate Framework-8 (ZIF-8): *Qi Wang*¹; Hong-Cai Zhou¹; Hongmin Qin¹; ¹Texas A&M University

9:05 AM Invited

In situ Powder Diffraction Measurements of Metal Organic Frameworks at 17-BM: Modern Techniques and Methods of Structural Analysis: *Andrey Yakovenko*¹; ¹Argonne National Laboratory

9:25 AM Invited

Metal-organic Cages as Sorbent Materials: A DFT Study: *Eric Cockayne*¹; ¹National Institute of Standards and Technology

9:45 AM Invited

Neutron Scattering Studies of Small Molecules Adsorbed in Metal-organic Frameworks: *Craig Brown*¹; ¹NIST

10:05 AM Break

10:25 AM Invited

Applications of Physisorbents as Sensor Coatings for Near Ambient Leak Detection of CO₂ and CH₄: *Jeffrey Culp*¹; Ki-Joong Kim¹; Jagannath Devkota¹; Paul Ohodnicki¹; ¹National Energy Technology Laboratory

10:45 AM Invited

Characterization of Gas-solid Interactions with In Situ X-ray Powder Diffraction: *Tomce Runcevska*¹; ¹Southern Methodist University

11:05 AM Invited

Neutron Diffraction: A Unique Technique to Study Gas Adsorption in Functional Porous Crystalline Materials: *Hui Wu*¹; ¹National Institute of Standards and Technology

11:25 AM

Foam Glass Insulator Properties Understanding through Microscopy Characterization: *Alisa Stratulat*¹; ¹Carl Zeiss Microscopy Limited

11:45 AM Invited

Porous Covalently-bonded Porphyrinic Materials: Predictions, Properties, and Applications: *Lawrence Cook*¹; Greg Brewer¹; Winnie Wong-Ng²; Lan Li³; ¹Catholic University of America; ²National Institute of Standards and Technology; ³Boise State University

User-related Failures — Non-Metallic Failures I

Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

Monday AM
October 15, 2018

Room: A210
Location: Greater Columbus Convention Center

Session Chairs: Ronald Parrington, ESI; Dave Moore, Unified Engineering Inc.; Dennis McGarry, Sea Limited

8:00 AM Invited

General Considerations in Failure Analysis of Rubber and Elastomers: *Jason Poulton*¹; ¹Akron Rubber Development Laboratory



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 COLUMBUS, OHIO, USA

8:40 AM

Failure Analysis of Coatings to Support Product Improvement: *Jessica Crimone*¹; Brittany Sinagra¹; ¹PPG

9:00 AM

Mechanical Properties and Fractography of Polyetheretherketone (PEEK) Composites as a Function of Filler Content: Farzana Ansari¹; *MariAnne Sullivan*¹; Ryan Siskey¹; ¹Exponent

9:20 AM

Fractographic Analysis of Amorphous Polymers – A Comparison of Tensile, Impact and ESC Fracture Surfaces of PC, ABS and PMMA: *Farzana Ansari*¹; ¹Exponent

9:40 AM

Analysis of a Ruptured Reinforced Thermoplastic Pipe: *Emily Gates*¹; Barbara Padgett¹; ¹DNV GL

10:00 AM Break

10:20 AM

Compression Fittings on PVC: An Industry-wide Mistake?: *David Riegner*¹; Greg Chojecki¹; Tom Easley¹; ¹S-E-A

10:40 AM Invited

Failure Analysis of Plumbing Components: Flexible Toilet Water Connectors: *Dinu Matej*¹; Eduardo Mari¹; ¹Origin and Cause

11:00 AM Invited

Collaboration with a Forensic Architect: *Andrew Havics*¹; Daniel Neeb²; ¹PH2 LLC; ²Halliwell Engineering Associates

11:20 AM

Non-destructive Method of Detecting Cracks in Fiberglass-reinforced Bucket Truck Booms: *Charles Dickinson*¹; Bryson Brewer¹; ¹Exponent

11:40 AM Invited

Utilizing a Combination of TGA and GC-MS to Estimate Health-based Risks from Off-gassed Volatile Compounds: *Joseph Lemberg*¹; Eric Guyer¹; Scott Seidel¹; Michael Garry¹; Joyce Tsuji¹; Steven Valenty²; ¹Exponent, Inc.; ²Analyze, Inc.

10th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Session II

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

Monday PM
 October 15, 2018

Room: B233
 Location: Greater Columbus Convention Center

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

2:00 PM Invited

Microstructure and Mechanical Properties of B4C-TiB2-SiC Composites Fabricated via Hot Pressing Assisted by Ball Milling: *Wang Weimin*¹; Fu Zhengyi¹; Wang Hao¹; ¹Wuhan University of Technology

2:20 PM Invited

Selective Laser Sintering of Ceramic Components, Challenges and Issues: *Tatsuki Ohji*¹; ¹National Institute of Advanced Industrial Science and Technology (AIST)

2:40 PM Invited

Spallation Resistance Enhancement of Thermal Barrier Coatings by Hybrid Microwave Sintering: Brian T. M.Ong¹; T. I.Wong¹; *Shijie Wang*¹; L. T. Koh²; W. K. Na²; ¹Institute of Materials Research and Engineering (IMRE), A*STAR (Agency for Science); ²ST Aerospace Engines Pte Ltd

3:00 PM

Recent Advances in Green Concrete: *Allen Apblett*¹; ¹Oklahoma State University

3:20 PM Break

3:40 PM

Luminescence Properties of Dy3+ Doped Ga2O3 Materials Synthesized by Using Wet Chemical Process: *Guangran Zhang*¹; Yiquan Wu¹; ¹Alfred University

4:00 PM

On the Design of Novel Lignin Based Green Materials: *Kathryn Hall*¹; Maharshi Dey¹; Yun Ji¹; Surojit Gupta¹; ¹University of North Dakota

4:20 PM

Novel Alkali-activation Based Process for the Manufacturing of Soda-lime Glass Foamed Granules: *Enrico Bernardo*¹; Acacio Rincon Romero¹; ¹University of Padova

4:40 PM

Energy Audit and Efficiency in an Aluminium Gravity Die Casting Foundry Towards Sustainability: *Hamid Mehrabi*¹; ¹Islamic Azad University

5:00 PM

Highly Efficient Solvolysis of Epoxy Resin Using Polyethylene Glycol/NaOH Systems: *Yang Peng*¹; Li Xiaoyang¹; ¹Institute of Electronic Engineering, China Academe of Engineering Physics

ACerS Richard M. Fulrath Award Session

Monday PM
 October 15, 2018

Room: A111/112
 Location: Greater Columbus Convention Center

Session Chair: Jonathan Salem, NASA

2:00 PM Invited

Atomic-scale Understanding of Ceramic Interfaces by Advanced Electron Microscopy: *Naoya Shibata*¹; ¹University of Tokyo

2:40 PM Invited

Development of Ceramics and Glass Materials for Solid Oxide Fuel Cell and Oxygen Permeable Membrane: *Yosuke Takahashi*¹; ¹Noritaki Co., Ltd.

3:00 PM Invited

Blending Cultures to Achieve Innovation: *Mark Waugh*¹; ¹Murata Electronics North America, Inc.

3:20 PM Break

3:40 PM Invited

Potassium Sodium Niobate-based Multilayer Piezoelectric Ceramics Co-fired with Nickel Inner Electrodes: *Shinichiro Kawanda*¹; ¹Murata Manufacturing Co., Ltd.

MONDAY PM

4:00 PM Invited

Undividing the Discipline: Social Interfaces in Ceramics Science and Engineering: *John McCloy*¹; ¹Washington State University

Additive Manufacturing of Composites and Complex Materials III — Additive Manufacturing of Metallic Composites

Program Organizers: Dirk Lehmhus, Fraunhofer - Ifam; Jonathan Spowart, Air Force Research Laboratory; Nikhil Gupta, New York University; Eric Jaegle, Max-Planck-Institut fuer Eisenforschung

Monday PM

October 15, 2018

Room: A222

Location: Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited

Shock Engineering the Additive Manufactured Graphene-metal Nanocomposite with High Density Nanotwins and Dislocations for Ultra-stable Mechanical Properties: *Dong Lin*¹; ¹Kansas State University

2:30 PM

Additive Manufacturing of Metal Matrix Composites via MELD: *Joey Griffiths*¹; *Chase Cox*²; *Nanci Hardwick*²; *Hang Yu*¹; ¹Virginia Tech; ²Aeroprobe Corporation

2:50 PM

Additive Manufacturing (AM) of Novel Aluminum Metal Matrix Composites: *Adam Polizzi*¹; *Jeremy Iten*¹; ¹Elementum 3D

3:10 PM

Development of Nano-Silicon Carbide Strengthened Aluminum Materials via MELD™ Processing: *Wayne Daye*¹; *Thomas Pelletiers II*¹; *Kévin Demoulin*²; *Nanci Hardwick*³; ¹Kymera International; ²Nanomakers Corporation; ³Aeroprobe Corporation

3:30 PM Break

3:50 PM

Microstructure and High-temperature Deformation Behavior of TiB₂-reinforced 316L Stainless Steel Nanocomposite Developed by Selective Laser Melting: *Kee-Ahn Lee*¹; *Bandar AlMangour*²; *Young-Kyun kim*¹; *Dariusz Grzesiak*³; ¹Inha Univ; ²Harvard University; ³West Pomeranian University of Technology

4:10 PM

Additive Manufacturing of Copper-alumina Composite Materials: *Sumit Bhattacharya*¹; *Kun Mo*¹; *Yinbin Miao*¹; *Abdellatif Yacout*¹; ¹Argonne National Laboratory

4:30 PM

Evaluation of Zirconium Oxide Nanoparticle Inks for Production of 316L Matrix Composites via the Binder Jetting Process: *Dirk Lehmhus*¹; *Sebastian Hein*¹; *Axel von Hehl*²; *Martin Ehlers*³; *Daniel Falkowski*³; *Onur Ortac*³; ¹Fraunhofer IFAM; ²Leibniz Institut für Werkstofforientierte Technologien (IWT); ³University of Bremen

4:50 PM

Additive Manufacturing of Cemented Tungsten Carbide with a Cobalt-free Alloy Binder by Selective Laser Melting for High-hardness Applications: *Nicholas Ku*¹; *John Pittari*¹; *Steven Kilczewski*¹; *Andelle Kudzal*¹; ¹US Army Research Laboratory

Additive Manufacturing of Metals: Microstructure and Material Properties — AM Stainless Steels - Microstructure and Properties

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

Monday PM

October 15, 2018

Room: A215

Location: Greater Columbus Convention Center

Session Chair: Ulf Ackelid, Freemelt Company

2:00 PM Invited

Stress-state Dependent Plasticity Model for Additively Manufactured Stainless Steel: Linking of Microstructural Phase Transformation to Macroscopic Behavior: *Zhuqing Wang*¹; *Allison Beese*¹; ¹Pennsylvania State University

2:40 PM

Deformation Mechanisms of L-PBF 316L Stainless Steels: *Thomas Voisin*¹; *Joseph McKeown*¹; *Jianchao Ye*¹; *Nicholas Calta*¹; *Zan li*¹; *Tien Roehling*¹; *Melissa Santala*²; *Phillip Depond*¹; *Manyalibo Matthews*¹; *Alex Hamza*¹; *Yimin Wang*¹; ¹Lawrence Livermore National Laboratory; ²Oregon State University

3:00 PM

Three-dimensional Registration of Part Design, Melt Pool History and Resultant Structure in Additively Manufactured 316L Stainless Steel: *Thomas Ivanoff*¹; *Jonathan Madison*¹; *Joshua Koepke*¹; *Erich Schwaller*¹; *Bradley Jared*¹; *John Mitchell*¹; *Laura Swiler*¹; ¹Sandia National Laboratories

3:20 PM Break

3:40 PM

The Effects of Alloy Composition on Microstructure of Duplex Stainless Steel Produced by Additive Manufacturing: *Andrew Iams*¹; *Todd Palmer*¹; ¹Pennsylvania State University

4:00 PM

Three Dimensional Grain Morphologies and Local Growth Textures of AM 316L: *David Rowenhorst*¹; *Richard Fonda*¹; ¹The US Naval Research Laboratory

4:20 PM

Understanding the Size and Location Dependence of Microstructure and Mechanical Properties of Stainless Steel 316L Rods Produced by Laser Powder Bed Fusion Process: *Xianglong Wang*¹; *Jose Alberto Muñoz-Lerma*¹; *Mohammad Attarian Shandiz*¹; *Oscar Sánchez-Mata*¹; *Mathieu Brochu*¹; ¹McGill University

4:40 PM

The Relationship Between Post-build Microstructure and the Corrosion Resistance of Additively-manufactured 17-4 Stainless Steel: *Mark Stoldt*¹; *Eric Lass*¹; *Maureen Williams*¹; *Richard Ricker*¹; *Carelyn Campbell*¹; *Lyle Levine*¹; ¹National Institute of Standards and Technology

5:00 PM

Twinning-induced Plasticity (TWIP) in Austenitic Stainless Steel 316L Produced by Means of Additive Manufacturing: *Clodualdo Aranas*¹; *Mohsen Mohammadi*¹; *Amir Hadadzadeh*¹; ¹University of New Brunswick



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Additive Manufacturing of Metals: Microstructure and Material Properties — Properties of AM Components

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

Monday PM
 October 15, 2018
 Room: A214
 Location: Greater Columbus Convention Center

Session Chair: Sudarsanam Babu, University of Tennessee

2:00 PM
Localized Dynamic Mechanical Behaviour Assessment Using Single and Cyclic nano-impact Indentations for Laser Powder Bed Fusion (L-PBF) Part Sections: *Abhi Ghosh*¹; Mathieu Brochu¹; ¹McGill University

2:20 PM
Mechanical Performance of Ti-6Al-4V Octet Truss Lattice Structures Produced Via Powder Bed Fusion (PBF): *Michael Brand*¹; Colt Montgomery¹; Robin Pacheco¹; John Carpenter¹; ¹Los Alamos National Laboratory

2:40 PM
Processing Refractory Metals and Intermetallics by Powder Bed Based Additive Manufacturing: *Vera Juechter*¹; ¹Heraeus Additive Manufacturing GmbH

3:00 PM
Effect of Flaws on the Fatigue Behavior of Additively Manufactured Ti-6Al-4V: *Griffin Jones*¹; Jayme Keist¹; ¹Pennsylvania State University

3:20 PM Break

3:40 PM
4340 Steel Laser Powder Bed Fusion (L-PBF) Round Robin Study: *Michael Hespos*¹; Elias Jelis¹; Matthew Clemente¹; ¹U.S. Army ARDEC-Picatinny Arsenal

4:00 PM
Correlation of Grain Morphology and Elongation to Failure in Additively Manufactured Ti-6Al-4V: *Alexander Wilson-Heid*¹; Zhuqing Wang¹; Allison Beese¹; ¹Pennsylvania State University

Additive Manufacturing: In-situ Process Monitoring and Control — Session II

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

Monday PM
 October 15, 2018
 Room: A221
 Location: Greater Columbus Convention Center

Session Chair: Ola Harrysson, North Carolina State University

2:00 PM Invited
AM Process Monitoring and Control at Layer and Melt Pool Scales: Luke Scime¹; Brian Fisher¹; *Jack Beuth*¹; ¹Carnegie Mellon University

2:40 PM
High-speed X-ray Imaging for Correlating Acoustic Signals with Quality Monitoring: A Machine Learning Approach: *Kilian Wasmer*¹; ¹Empa

3:00 PM
In-situ Process Monitoring and Closed-loop Control System for Metal Powder Bed Fusion: *Prabir Chaudhury*¹; ¹Divergent3D

3:20 PM Break

3:40 PM
Direct Process Feedback in Extrusion-based Additive Manufacturing Using an ILC-based Approach: *Ashley Armstrong*¹; Amy Wagoner Johnson¹; Andrew Alleyne¹; ¹University of Illinois

4:00 PM
Using Laser Ultrasonics to Measure Responses of Nickel, Titanium, and Stainless Steel Alloys Processed by Laser-based Directed Energy Deposition: *Marissa Brennan*¹; Todd Palmer¹; Max Wiedmann²; Marvin Klein²; ¹Penn State University; ²Intelligent Optical Systems

4:20 PM
Real Time Monitoring of Additive Manufacturing Processes Using High-speed Synchrotron X-ray Imaging: *Niranjana Parab*¹; Cang Zhao¹; Kamel Fezzaa¹; Tao Sun¹; ¹Argonne National Laboratory

4:40 PM
In-situ Defect Detection in Three-dimensional Metal Printing, Using the Structure being Built to Sense Itself: *Wenyi Yang*¹; Sanjaya Somaratna¹; Deborah Chung¹; ¹State University of New York Buffalo

5:00 PM
In-situ High-energy X-ray Diffraction on Wire Arc Deposition of 308 Stainless Steel and Titanium: *Adrian Losko*¹; Don Brown¹; Maria Strantza¹; Reeru Pokharel¹; John Carpenter¹; Jason Cooley¹; Bjorn Clausen¹; Erik Watkins¹; Nicholas Calta²; Ibo Matthews²; Jun-Sang Park³; Peter Kenesei³; ¹Los Alamos National Laboratory; ²Lawrence Livermore National Laboratory; ³Argonne National Laboratory

Additive Manufacturing: Modeling and Simulation of AM Materials, Processes, and Mechanics — AM Modeling - Session II

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

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

Session Chairs: Jing Zhang, Indiana University - Purdue University Indianapolis; Li Ma, National Institute of Standards and Technology

2:00 PM
Prediction of Resultant Hardness and Residual Stress in Laser-based Additive Manufacturing via Integrated Computational Modeling: Neil Bailey¹; Christopher Katinas¹; *Yung Shin*¹; ¹Purdue University

2:20 PM
Microstructure Prediction of Laser Powder Bed Fused Metal Using Combined CFD and CA Method: *Yi Zhang*¹; Jing Zhang¹; ¹Indiana University-Purdue University Indianapolis

2:40 PM
Study and Modelling of Resin Propagation in Porous Catalyzing Medium: *Adam Krajewski*¹; Matthew Willard¹; ¹Case Western Reserve University

MONDAY PM

3:00 PM

3D Printing of Zircon for Ceramic Molds: *Piyush Pai Raikar*¹; Jing Zhang¹; Hye-Young Park²; Yeon-Gil Jung²; ¹Indiana University Purdue University Indianapolis; ²Changwon National University, Republic of Korea

3:20 PM Break

3:40 PM

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

4:00 PM

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

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

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

Monday PM

October 15, 2018

Room: A224

Location: Greater Columbus Convention Center

Session Chair: Peeyush Nandwana, ORNL

2:00 PM

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

2:20 PM

Investigation of the Properties of Electron Beam Melted Parts Using Coarse Ti6Al4V Powder Feedstock: *Hengfeng Gu*¹; Timothy Horn¹; Harvey West¹; Ola Harrysson¹; ¹NC State University

2:40 PM

From Powder to Part: Powder Evolution Effects on Processing-microstructure-properties Relationship in AM: *Bij-Na Kim*¹; Pedro Rivera²; ¹LPW / Lancaster University; ²Lancaster University

3:20 PM Break

3:40 PM

Selective Laser Melting of Al10SiMg Alloys from Gas Atomized Powders with Variable Size Distribution: *Sharon Park*¹; Holden Hyer¹; Le Zhou¹; Bjorn Tolentino¹; Edward Dein¹; Brandon McWilliams²; Kyu Cho²; Yongho Sohn¹; ¹University of Central Florida; ²U.S. Army Research Laboratory

4:00 PM

The Role of Powder Properties on Additive Manufacturability of AlSi10Mg: *Nathan Kistler*¹; ¹LPW Technology

4:20 PM

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

4:40 PM

Powder Characterization and LPBF Parameter Development for AF9628: *Erin Hager*¹; ¹AFIT/ENY

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

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

Monday PM

October 15, 2018

Room: C160A/160B

Location: Greater Columbus Convention Center

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

2:00 PM

Characterizations of CrN-based Hard Coating Materials with Addition of GaN: *Yusei Mizuno*¹; Tadachika Nakayama¹; Hisayuki Suematsu¹; Tsuneo Suzuki¹; ¹Extreme Energy-Density Research Institute, Nagaoka University of Technology

2:20 PM

Ultrathin Graphene Coating on Monel 400 Alloy for Durable Corrosion Resistance: *Sanjid Patwary*¹; RK Singh Raman¹; Parama Chakraborty Banerjee¹; ¹Monash University

2:40 PM

Plasma Electrolytic Oxidation Coatings on Light Alloys (Al, Mg, Ti): Properties and Applications: *Vahid Dehnavi*¹; Mojtaba Vakil-azghandi²; Arash Fattah-alhosseini²; James Noël¹; David Shoesmith¹; ¹Western University; ²Bu-Ali Sina University

3:00 PM

Formation Mechanisms of Wear-protective Tribofilms by ZDDP, Ionic Liquid, and their Combination: *Wei Guo*¹; Yan Zhou²; Xiahan Sang³; Donovan N. Leonard²; Jun Qu²; Jonathan D. Poplawsky³; ¹Material Science Research and Development, Timken World Headquarters; ²Materials Science and Technology Division, Oak Ridge National Laboratory; ³Center for Nanophase Materials Sciences, Oak Ridge National Laboratory

3:20 PM Break

3:40 PM

Coating Wear Performance of REACH Compliant Trivalent Chromium Hard Chrome: Timothy Hall¹; *Rajeswaran Radhakrishnan*¹; Stephen Snyder¹; Jing Xu¹; Maria Inman¹; EJ Taylor¹; George Bokisa²; Mark Feathers³; ¹Faraday Technology Inc.; ²COVENTYA Inc.; ³U.S. Army Aviation and Missile Command

4:00 PM

Direct Electrodeposition on 6061 Aluminum: Timothy Hall¹; *Jing Xu*¹; Stephen Snyder¹; Maria Inman¹; EJ Taylor¹; ¹Faraday Technology Inc

4:20 PM

Inhibition of Engineering Materials in Sulphuric Acid Solution Using Waste Product: *Omotayo Sanni*¹; API Popoola¹; OS Fayomi¹; ¹Tshwane University of Technology, Pretoria, South Africa

4:40 PM

Variables that Effect Reproducibility in Cyclic Corrosion Testing and their Relation to Coating's Physical Properties: *Nicole Rakers*¹; Kathryn Hoffman¹; Arif Mubarak¹; ¹PPG



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

Advanced Manufacturing, Processing, Characterization, and Modeling of Functional Materials — Advanced Manufacturing I

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

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

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

2:00 PM Invited

Wire Size Effect on Kirkendall Pore Evolution in Ti-coated Nickel Wires: *Arun Bhattacharjee*¹; Ajith Achuthankutty¹; Aaron Yost²; Dinc Erdeniz²; David Dunand²; Ashley Paz y Puente¹; ¹University of Cincinnati; ²Northwestern University

2:40 PM

Metal-polymer and Polymer-polymer Shape Memory Hybrids: *Vibhor Chaswal*¹; Ruchinda Gooneratne²; Mangu Sriharsha²; ¹University of Cincinnati; ²University of Cincinnati

3:00 PM

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

3:20 PM Break

3:40 PM

Comparative Analysis of Internal Features of EBM with a Flash Tomography and Computed Topography Technique: *Oluwaseun Adewumi*¹; ¹North Carolina A&T

4:00 PM

Magnetocaloric Effect in Heusler Alloys Derived from Cellular Automata Simulations: *Javier Blázquez*¹; Alejandro Manchón-Gordón¹; Clara Conde¹; Victorino Franco¹; Alejandro Conde¹; ¹University of Sevilla

4:20 PM

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

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

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

Monday PM
October 15, 2018
Room: C161A/161B
Location: Greater Columbus Convention Center

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

2:00 PM Invited

Metallic Alloys Development for Additive Manufacturing Using Gas Atomization and Powder Bed Fusion: *Le Zhou*¹; Yongho Sohn¹; ¹University of Central Florida

2:40 PM

Laboratory-scale Replication of Complex High Temperature Corrosion Behavior Found in Service: *Matthew Kovalchuk*¹; ¹University of Pittsburgh

3:00 PM

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

3:20 PM

Thermo-mechanical Performance and Microstructural Correlation in ZrB₂-based Ultra-high Temperature Ceramic Composites: *Ambreen Nisar*¹; *Kantesh Balani*¹; ¹Indian Institute of Technology Kanpur

3:40 PM Break

4:00 PM

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

4:20 PM

Transition Metal Silicide-based Ceramic Composites for High Temperature and Harsh Environment Sensing: *Gunes Alp Yakaboylu*¹; Rajalekshmi Chockalingam¹; Katarzyna Sabolsky¹; Tugrul Yumak²; Edward Sabolsky¹; ¹West Virginia University; ²Sinop University

4:40 PM

Wireless Embedded Multifunctional Sensor System for In-situ Health Monitoring of Refractory Liners in Fossil Energy Systems: *Rajalekshmi Pillai*¹; Sreekumar Chockalingam¹; Samuel Baker¹; ¹SRS Holdings LLC

5:00 PM Concluding Comments

MONDAY PM

Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder — Session II

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

Monday PM
October 15, 2018

Room: B140/141
Location: Greater Columbus Convention Center

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

2:00 PM Invited

Thermomechanical Reliability of Lead-free High Temperature Solder Alloys: Faramarz Hadian¹; Francis Mutuku¹; Harry Schoeller²; Eric Cotts³; ¹Binghamton Univ; ²Universal Instruments; ³Binghamton University

2:20 PM

Inhibiting the Large Primary Ag₃Sn in Cu/Sn-Ag/ENIG Solder Joints with Additional Pd Deposit: Rui-Wen Song¹; Jenq-Gong Duh¹; ¹National Tsing Hua University

2:40 PM

Growth Behavior of Recrystallization Grain in Lead-free Solder Joint after Deformation: Fu Guo¹; Xuwei Zhao¹; Yishu Wang¹; Jing Han¹; ¹Beijing University of Technology

3:00 PM

Improving Shear Strength of Sn-3.0Ag-0.5Cu Solder Joints via Adding Minor Ni into Solder Alloy: Tzu-Ting Chou¹; Wei-Yu Chen¹; Rui-Wen Song¹; Jenq-Gong Duh¹; ¹National Tsing Hua University

3:20 PM Break

3:40 PM Invited

Mechanism of Recrystallization in Sn-based Ball Grid Array Lead-free Solder Joints during Thermomechanical Fatigue: Fu Guo¹; Shihai Tan¹; ¹Beijing University of Technology

4:00 PM

IMC Growth Behavior Along c-axis of Sn Grain under Current Stressing: Fu Guo¹; Yan Wang²; Limin Ma²; ¹Beijing University of Technology; ²Beijing University of Technology

4:20 PM

Ostwald Ripening in near eutectic SnAgCu solder alloys: Randy Owen¹; Mohammed Genanu¹; Eric Cotts¹; ¹Binghamton University, Physics Department

Advanced Steel Metallurgy: Products and Processing — Lightweight Steels

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

Monday PM
October 15, 2018

Room: A226
Location: Greater Columbus Convention Center

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

2:00 PM Keynote

Newly Commercialized High Mn Steel Products and Process for Various Applications: Sang-Hyeon Lee¹; Inshick Suh¹; Sung Kyu Kim¹; TaeKyo Han¹; Won-Tae Cho¹; Unhae Lee¹; Myeong Hun Kang¹; Dongho Lee¹; Sang Ho Han¹; ¹POSCO

2:40 PM

Characterizing Microstructures in High Mn, High Al Steels for Next Generation Thick Plate Applications: Katherine Sebeck¹; Demetrios Tzelepis¹; Ian Toppler¹; ¹TARDEC

3:00 PM

Effects of Micro-alloying and Processing History on Fe-Mn-Al-C Steel: Krista Limmer¹; Daniel Field¹; Bryan Cheeseman¹; Ryan Howell²; ¹US Army Research Laboratory; ²US Army PEO GCS

3:20 PM

Low-density Steels Scientific and Technological Macro-indicators: Malena Andrade¹; Bráulio Oliveira¹; Douglas Milanez¹; Daniel Leiva¹; Guilherme Zepon¹; ¹Federal University of São Carlos

3:40 PM Break

4:00 PM

Trade-off between Strength and Ductility by Variation in Microstructural Features and Recrystallization Kinetics of Medium Mn Multicomponent Alloy: Arnab Sarkar¹; Tapas Kumar Bandyopadhyay¹; ¹Indian Institute of Technology Kharagpur

4:20 PM

Hot Deformation Behavior of a Low Density Austenitic Steel: Dean Pierce¹; Katherine Sebeck²; Krista Limmer³; Govindarajan Muralidharan¹; Tom Muth¹; David Frederick¹; Zhili Feng¹; ¹Oak Ridge National Laboratory; ²US Army Tank Automotive Research Development & Engineering Center (TARDEC); ³US Army Research Laboratory

4:40 PM

Microstructural Evolution and Age Hardening Behavior of a Lightweight Ultrahigh Strength Fe-15Mn-11Al-0.9C-6Ni Steel: Michael Piston¹; ¹Missouri Science & Technology

5:00 PM

A Study on the Micromechanical Deformation and Phase Transformation Behaviors in Lightweight Duplex Steel: Shi-Hoon Choi¹; Eun-Young Kim¹; Wan-Chuck Woo²; Dong-Kyu Kim²; ¹Sunchon National University; ²Korea Atomic Energy Research Institute



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

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

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

Monday PM
October 15, 2018

Room: B132
Location: Greater Columbus Convention Center

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

2:00 PM Invited

Magnetoelectric Gytrators for I-V Conversion: *Dwight Viehland*¹; Chung Ming Leung¹; Xin Zhuang¹; Jiefang Li¹; ¹Virginia Tech

2:20 PM Invited

NSMM Modeling and Design of Energy Conversion Materials: *Steven Tidrow*¹; ¹Alfred University

2:40 PM

A Phenomenological Theory for Lead-free Piezoelectrics based on Ba(Zr,Ti)O₃-(Ba,Ca)TiO₃ (BZT-BCT) Solid Solutions: *George Rossetti*¹; Nasser Khakpash¹; ¹University of Connecticut

3:00 PM

Dipole Engineering: Increasing Material Breakdown Strength and Capacitor Energy: *Steven Tidrow*¹; *Soutik Betai*¹; Dustin Travis¹; Jessica Scoones¹; Walter Schulze¹; Steven Pilgrim¹; ¹Alfred University

3:20 PM Break

3:40 PM

Orientation-modulated Crystal Structure and Energy Storage Behavior of Epitaxial Antiferroelectric (Pb_{0.98}La_{0.02})(Zr_{0.95}Ti_{0.05})O₃ thin films: *Min Gao*¹; Xiao Tang¹; Chung Ming Leung¹; Jiefang Li¹; Dwight Viehland¹; ¹Virginia Tech

4:00 PM

Lead Free Ferroelectric [KNbO₃]_{1-x}[(BaNi_{1/2}Nb_{1/2}O₃-d)]_x : An Insight into Its Dielectric, Ferroelectric Ordering, and Phonon Behaviors.: *Blanca Rosas*¹; Karuna Mishra¹; Alvaro Instan¹; Ram Katiyar¹; ¹University of Puerto Rico

4:20 PM

Effects of Electrode Microstructure on Resistance Degradation of SrTiO₃: *Daniel Long*¹; Biya Cai¹; Elizabeth Dickey¹; ¹North Carolina State University

4:40 PM

Mechanochemical synthesis of High T_c La₂Ti₂O₇ Piezoceramic: *Kaustubh Kambale*¹; Ajit Kulkarni²; Narayanan Venkataramani²; Amruta Vairagade¹; Sandeep Butee¹; ¹College of Engineering Pune; ²Indian Institute of Technology Bombay

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

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

Monday PM
October 15, 2018

Room: A225
Location: Greater Columbus Convention Center

Session Chair: Erika Bellhouse, ArcelorMittal Dofasco

2:00 PM

A Novel Approach to the Direct Quantification of Iron Dissolution from the Steel Strip into the 55Al-2Mg-1.6Si-Zn Coating Alloy Bath: *Syed Islam*¹; Daniel Parker²; Nega Setargew²; Abdul Khaliq¹; Ma Qian¹; ¹RMIT University/ARC Research Hub for Australian Steel Manufacturing; ²BlueScope/ARC Research Hub for Australian Steel Manufacturing

2:20 PM Invited

Growth of Intermetallic Compounds (IMCs) in an Al-Zn-Si-Mg Alloy Coating Bath: *Abdul Khaliq*¹; Daniel J. Parker²; Nega Setargew²; Ma Qian¹; ¹RMIT University, Melbourne Australia/ ARC Research Hub for Australian Steel Manufacturing, University of Wollongong; ²BlueScope Innovation/ARC Research Hub for Australian Steel Manufacturing, University of Wollongong

2:50 PM

Microstructural Evolution in Al-Si Coating of Different Thickness of Hot Stamping Steels: *Igor Yakubtsov*¹; Raj Sohmshetty¹; ¹Ford Motor Company

3:10 PM

Corrosion Resistance of Zinc Coatings Doped with Aluminum Obtained under Conditions of SHS: *Borys Sereda*¹; *Dmytro Sereda*²; ¹Zaporizhzhya State Engineering Academy; ²DDTU

3:30 PM Break

3:50 PM

Investigation of the Microstructure and Mechanical Properties of Sheet Steel after Obtaining Zinc Coatings under SHS Conditions: *Borys Sereda*¹; *Dmytro Sereda*¹; *Irina Sereda*¹; ¹DDTU

4:10 PM

TEM Characterisation of the Intermetallic Alloy Layer on 55%Al-Zn-2%Mg-1.5%Si Alloy Coated Steel: *Syed Islam*¹; Daniel Parker²; Nega Setargew²; Abdul Khaliq¹; Ma Qian¹; ¹RMIT University/ARC Research Hub for Australian Steel Manufacturing; ²BlueScope/ARC Research Hub for Australian Steel Manufacturing

4:30 PM

Effect of Shearing Quality on Forming Limit Diagram for Vinyl Coated Metal: *Jonghun Yoon*¹; ¹Hanyang Univ. ERICA

MONDAY PM

Alpha Sigma Mu Lecture

Monday PM
October 15, 2018

Room: C170
Location: Greater Columbus Convention Center

2:30 PM Invited

The Role of Rapid Technology Advances and Socio-environmental Drivers on the Evolution of Process and Product Developments in Steel: *Ronald O'Malley*¹;
¹Missouri University of Science and Technology

Boron, Boron Coatings, Boron Compounds and Boron Nanomaterials: Structure, Properties, Processing, and Applications — Novel Synthesis & Boron Suboxide

Program Organizers: Jens Kunstmann, Technische Universität Dresden; Roumiana Petrova, New Jersey Institute of Technology; Scott Beckman, Washington State University

Monday PM
October 15, 2018

Room: B244/245
Location: Greater Columbus Convention Center

Session Chair: Scott Beckman, Washington State University

2:00 PM

Boron Suboxide: Changes in Densification and Microstructure Using Silica and Rare Earth Silicate Additives: *Kristopher Behler*¹; Jerry LaSalvia²; Chris Marvel³; Jenn Synowczynski-Dunn²; Scott Walck¹; W. Shoulders⁴; Martin Harmer³;
¹ArI (Survive Engineering); ²ARL; ³Lehigh University; ⁴ARL (ORAU)

2:20 PM

Experimental Investigation of the Stoichiometry-hardness Relationship in Boron Suboxide: *Taylor Shoulders*¹; Kristopher Behler²; Jerry LaSalvia³; ¹ORAU; ²SURVICE; ³US Army Research Lab

2:40 PM

Synthesis, Sintering and Mechanical Properties of Boron Suboxide (B₂O₃) and Its Composites: *Atta Khan*¹; Kelvin Xie²; Vladyslav Domnich¹; Kevin Hemker²; Richard Haber¹; ¹Rutgers University; ²Johns Hopkins University

3:00 PM

Effects of Oxygen Partial Pressure on the Oxidation of Boron-rich Silicon Boride: *Muhammad Imam*¹; Ramana Reddy¹; ¹University of Alabama

3:20 PM Break**3:40 PM**

Boron Nitride Aerogel as a Thermal Conductive 3D Network for Phase Change Materials: *Marjan Kashfipour*¹; Russell Dent¹; Nitin Mehra¹; Jiahua Zhu¹;
¹University of Akron

4:00 PM

Improvement in Wear Resistance of AISI H13 Steel by Pack-boronizing Method: *Niketan Manthani*¹; ¹Kalyani Center for Technology and Innovation

4:20 PM

Hardening of Steels with Boron Coatings Obtained under Self-propagating High Temperature: *Borys Sereda*¹; Dmytro Sereda²; ¹Zaporizhzhya State Engineering Academy; ²DDTU

Ceramic and Crystal Materials for Optics and Photonics — Session II

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Michael Squillante, RMD, Inc; Akio Ikesue, World-Lab. Co., Ltd; Mark Dubinskiy, Amy Research Laboratory

Monday PM
October 15, 2018

Room: A113
Location: Greater Columbus Convention Center

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

2:00 PM Invited

Micro Domain and Boundary Control for Ubiquitous Power Laser: *Takunori Taira*¹; ¹Inst. for Molecular Science

2:40 PM

Double Cladded Single Crystal Fiber for High-energy Lasers: *Shyam Bayya*¹; Woohong Kim¹; Brandon Shaw¹; Jason Myers¹; Syed Qadri¹; Rajesh Thapa²; Charles Askins²; John Peele²; Daniel Rhonehouse¹; Steven Bowman¹; Daniel Gibson¹; Joseph Kolis³; Brad Stadler³; Jasbinder Sanghera¹; ¹Naval Research Laboratory; ²KeyW Corp.; ³Clemson University

3:00 PM

Methods to Improve Particle Segregation and Mixing in Transparent Ceramic Nanocomposites for Mid-IR Solid State Lasers: *Victoria Blair*¹; Steven Kilczewski¹; Aubrey Fry²; Anthony DiGiovanni¹; Zackery Fleischman¹; ¹Army Research Laboratory; ²ORAU

3:20 PM Break**3:40 PM Invited**

Development of Transparent Ceramic Fibers for Laser Applications: *Hyunjun Kim*¹; Randall Hay²; Randall Corns¹; ¹Air Force Research Laboratory & UES, Inc.; ²Air Force Research Laboratory

4:20 PM Invited

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

5:00 PM Invited

Spark Plasma Sintering of Transparent Birefringent Ceramics with Fine Microstructures: *Byungnam Kim*¹; ¹National Inst for Materials Science

Characterization & Methods in Failure Analysis — Tools & Techniques II

Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

Monday PM
October 15, 2018

Room: A211
Location: Greater Columbus Convention Center

Session Chairs: Erhan Ulann, Acuren Group Inc.; Mark Russell, Engineering Design & Testing Corporation; Tim Jur, Engineering Design & Testing Corporation; Ellen Wright, Engineering Systems Inc.

2:00 PM

Rapid, Large Elemental Profiles by SEM/EDS Facilitated by a Silicon Drift Detector: *John Konopka*¹; ¹Thermo Fisher Scientific



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COLUMBUS, OHIO, USA

2:20 PM

Case Studies of Large Elemental Profiles Acquired by SEM/EDS Using a Silicon Drift Detector: *John Konopka*¹; ¹Thermo Fisher Scientific

2:40 PM Invited

Fluorescence Microscopy & Macroscopy: *Andrew Havics*¹; ¹PH2 LLC

3:00 PM Invited

A Procedure for Examination of Combustion Product Analysis: *Tim Jur*¹; *Burak Akyuz*²; ¹Engineering Design & Testing Corp; ²ATS, Inc.

3:20 PM Break

3:40 PM

Failure Analysis of Rapid-aged Porcelain Insulators: *Max Modugno*¹; *Hyojin Lee*²; *William Carty*²; ¹Alfred University; ²New York State College of Ceramics at Alfred University

4:00 PM Invited

Failure Analysis of Masonry Building: *Ankit Mahajan*¹; ¹Chandigarh University

4:20 PM Invited

Characterization of the Composition of Plastic Parts as an Often Necessary Step in a Failure Analysis: *Tim Jur*¹; *Richard Edwards*¹; *Caleb Davis*¹; ¹Engineering Design & Testing Corp

Composition-Processing-Microstructure-Property Relationships of Titanium Alloys — Deformation and Transformations

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

Monday PM
October 15, 2018

Room: C150
Location: Greater Columbus Convention Center

Session Chairs: Adam Pilchak, US Air Force Research Lab; Asli Bulutsuz, Yildiz Technical University

2:00 PM Invited

Strain-transformable Titanium Alloys for Improved Resistance/Ductility Trade-off: From Design Principles to Mechanical Properties: *Frederic Prima*¹; *Fan Sun*¹; *Lola Liliensten*¹; *Yolaine Danard*¹; *Cédrik Brozek*¹; *Philippe Vermaut*¹; *Immanuel Freiherr Von Thungen*²; *Yvon Millet*³; ¹Chimie ParisTech; ²SAFRAN TECH; ³TIMET Savoie

2:30 PM

Investigation of Alpha/Beta Interface Structure in a Metastable Beta Titanium Alloy: *Yufeng Zheng*¹; *William Clark*¹; *Hamish Fraser*¹; ¹The Ohio State University

2:50 PM Invited

New Experimental and Computational Tools to Understand and Predict Composition-processing-microstructure-property-(performance) Relationships in Titanium Alloys: *Thomas Ales*¹; *Brian Martin*¹; *Andrew Temple*¹; *D Harlow*²; *Peter Collins*¹; ¹Iowa State University; ²Lehigh University

3:20 PM Invited

Crystalline Defects Induced by Phase Transformations in Ti-alloys: *Yipeng Gao*¹; ¹Idaho National Laboratory

3:50 PM Break

4:10 PM Invited

Development of a Quantitative Microstructure Simulator to Decipher Composition-processing-microstructure Relationships in Titanium Alloys: *Rongpei Shi*¹; *Tae Wook Heo*¹; *Saad Khairallah*¹; *Joseph Mckeown*¹; *Manyalibo Matthews*¹; ¹Lawrence Livermore National Laboratory

4:40 PM

Investigation of Different Severe Plastic Deformation Methods Effect on Ti13Nb13Zr: *Asli Günay Bulutsuz*¹; *Kadir Özaltın*²; *Witold Chrominski*²; *Malgorzata Lewandowska*²; *Mehmet Emin Yurci*¹; ¹Yildiz Technic University; ²Warsaw University of Technology

5:00 PM

Strain Path Dependency of Damage Evolution in Titanium Alloy: A Multi-field Mapping Study: *Jiyun Kang*¹; *Cemal Cem Tasan*¹; ¹MIT

5:20 PM

Effect of Caliber Rolling Temperature on Room and Elevated Temperature Tensile Properties of Ti-6Al-4V Alloy: *Jagadeesh Babu S M*¹; *S. V. S. Narayana Murty*²; *N. Prabhu*¹; *B.P. Kashyap*³; ¹Indian Institution Of Technology Bombay; ²Vikram Sarabhai Space Center, ISRO; ³Indian Institute of Technology Jodhpur

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Session I

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

Monday PM
October 15, 2018

Room: D180
Location: Greater Columbus Convention Center

Funding Support provided by: MilliporeSigma

Session Chairs: Haitao Zhang, University of North Carolina at Charlotte; Jian Shi, Rensselaer Polytechnic Institute

2:00 PM Invited

Metal Nanoparticles Synthesized via Metal-in-Li Solutions: *Tao Xu*¹; ¹Department of Chemistry and Biochemistry

2:30 PM

Nanorods: From Synthesis Science to Metallic Glue Technology: *Hanchen Huang*¹; ¹Northeastern University

2:50 PM

Molecular Dynamics Simulation of Melting and Solidification of Cu/Al And Ti/Al Core/Shell Nanoparticles: *Farzin Rahmani*¹; *Sasan Nouranian*; *Jungmin Jeon*¹; *Shan Jiang*¹; ¹University of Mississippi

3:10 PM

Nanoscale Soldering of Magnetic-assisted Self-assembled Multi-segment Metallic Nanowires: *Jirui Wang*¹; *Fan Gao*¹; *Chefu Su*¹; *Junwei Su*¹; *Hongwei Sun*¹; *Zhiyong Gu*¹; ¹University of Massachusetts Lowell

3:30 PM Break

3:50 PM Invited

Three-dimensional Mapping of Topological Relicts of Symmetry Breaking in Functional Nanomaterials: *Edwin Fohtung*¹; *Dmitry Karpov*¹; ¹New Mexico State University

MONDAY PM

4:20 PM

Self-organized 3D Networks of Tetragonal CuFe₂O₄: Pelagia Gouma¹; *Gagan Jodhani*¹; ¹The Ohio State University

4:40 PM

Synthesis and Characterization of Ba²⁺, Al³⁺ and Sr²⁺, Al³⁺ and Ca²⁺, Al³⁺ Co-modified Multiferroic BiFeO₃ Nanoparticles: Sikder Ayon¹; *Ayeman Mazdi*¹; Musavvir Mahmud¹; Ahmed Sharif¹; Hasan Usama¹; ¹Bangladesh University of Engineering and Technology

5:00 PM Invited

Bioinspired Hierarchical 3D Carbon Architectures: Beyond Graphene and Nanotubes: *Sharmila Mukhopadhyay*¹; ¹Wright State University

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

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

Monday PM

October 15, 2018

Room: B232

Location: Greater Columbus Convention Center

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

2:00 PM Invited

Incorporating Service-learning and Storytelling for a More Inclusive Materials Science Education: *Eric Jankowski*¹; ¹Boise State University

2:40 PM

Engaging Students through Research Sprints: *Daniel Christie*¹; Matteo Caligaris¹; ¹Elsevier

3:00 PM

Additive Manufacturing in Undergraduate Engineering Curriculum: Alison Polasik¹; *Cindy Waters*²; ¹The Ohio State University; ²North Carolina A&T State University

3:20 PM Break

3:40 PM

Utilizing Digital Data in an Undergraduate Materials Kinetics Course: *Susan Gentry*¹; ¹University of California, Davis

4:00 PM

Curricular Innovations at the South Dakota School of Mine and Technology: Experiential Learning Outcomes and Assessment: *Michael West*¹; William Cross¹; Jon Kellar¹; Bharat Jasthi¹; Grant Crawford¹; Sadegh Safarzadeh¹; ¹South Dakota School of Mines and Technology

4:20 PM

Micro-projects to Engage, Educate and Entertain: *Mike Ashby*¹; Hannah Melia²; Luca Masi²; Marc Fry²; ¹University of Cambridge; ²Granta Design

4:40 PM

The Role of Locally Sourced Materials in Engineering for Humanity Education: *Ian Nettlehip*¹; Kent Harries¹; ¹University of Pittsburgh

5:00 PM

Experiences and Outcomes of Teaching Senior Capstone Course: *Raghu Echempati*¹; ¹Kettering University

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

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

Monday PM

October 15, 2018

Room: C162A/162B

Location: Greater Columbus Convention Center

Session Chair: Ankit Srivastava, Texas A&M University

2:00 PM Invited

An Experimental Irradiation Assembly for the Performance of In-Reactor IASCC Tests under Cyclic Loading: *Sergei Shipilov*¹; ¹Corrosion Engineering Solutions Ltd.

2:30 PM

An Application of Stochastic Modeling to PitCrack of Spent Nuclear Fuel Canisters: *Zeev Shayer*¹; ¹Colorado School of Mines

2:50 PM

Direct Observation of Pitting Corrosion Evolutions on Carbon Steel Surfaces at the Nano-to-micro-scales: *Erika La Plante*¹; Peng Guo¹; Bu Wang²; Xin Chen¹; Magdalena Balonis¹; Mathieu Bauchy¹; Gaurav Sant¹; ¹University of California Los Angeles; ²University of Wisconsin-Madison

3:10 PM

Water Infrastructure Corrosion: What Prevents Us from Preventing It?: *Sergei Shipilov*¹; ¹Corrosion Engineering Solutions Ltd.

3:30 PM Break

3:50 PM Invited

Localised Corrosion of Stainless Steel Reinforcements in Concrete: *David Bastidas*¹; ¹The University of Akron-NCERCAMP

4:20 PM

Microstructure and Hydrogen Accelerated Fatigue Crack Growth Rates of Pipeline Steels: *Eun-Ju Song*¹; Joseph Ronevich¹; ¹Sandia National Laboratories

4:40 PM

Evaluating the Potential for Atmospheric Corrosion and Subsequent Stress Corrosion Cracking of SS304 Used for Dry Storage of Spent Nuclear Fuel: *Tim Weirich*¹; Christopher Alexander²; Charles Bryan²; Eric Schindelholz²; Jenifer (Warner) Locke¹; ¹Ohio State University; ²Sandia National Laboratories



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology — Mechanical Properties of Glasses

Program Organizers: John Kieffer, University of Michigan; Liping Huang, Rensselaer Polytechnic Institute

Monday PM
October 15, 2018

Room: A115
Location: Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited

Increasing the Strength of Glass: *Sheldon Wiederhorn*¹; Theo Fett²; ¹National Institute of Standards and Technology; ²Karlsruhe Institute of Technology

2:30 PM Invited

High Strength Glass for Foldable Applications: *Timothy Gross*¹; ¹Corning Research and Development Corporation

3:00 PM

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

3:20 PM Break

3:40 PM Invited

Network Topology and Property Understanding in Borate Glasses: *Randall Youngman*¹; ¹Corning Incorporated

4:10 PM Invited

Pressure Effects on Boron and Aluminum Coordination Numbers and Mechanical Properties: *Jingshi Wu*¹; Timothy Gross¹; Liping Huang²; Siva Priya Jaccani²; ¹Corning Inc.; ²Rensselaer Polytechnic Institute

4:40 PM

Applying Topological Constraint Theory to Six-fold-coordinate Amorphous Hydrogenated Boron Carbide: *Michelle Paquette*¹; Bradley Nordell²; Anthony Caruso¹; Paul Rulis¹; Nathan Oyler¹; William Lanford³; David Gidley⁴; Ridwan Sakidja⁵; Jinwoo Hwang⁶; Sean King⁷; ¹University of Missouri-Kansas City; ²University of Nebraska-Lincoln; ³University at Albany; ⁴University of Michigan; ⁵Missouri State University; ⁶Ohio State University; ⁷Intel Corporation

5:00 PM

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

IMS Symposium on Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties — Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties I

Program Organizers: Daniel Dennies, DMS, Inc.; James Martinez, NASA Johnson Space Center; Michael Keeble, Buehler, A Division of ITW; Jaret Frafjord, IMR Test Labs - Portland

Monday PM
October 15, 2018

Room: A212
Location: Greater Columbus Convention Center

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

2:00 PM Invited

Analyzing the Effect of Overheating HY-80/100 Steel: *Gabriel Lucas*¹; Brian Battle¹; Johnathon Brehm²; ¹Scot Forge Company; ²University of Wisconsin-Madison

2:20 PM

Austenite-bainite Transformation Kinetics in Austempered AISI 5160 Steel: *Xue Han*¹; Gary Barber¹; Zhenpu Zhang¹; Xichen Sun²; Bingxu Wang¹; Jian Zhu²; ¹Oakland University; ²Fiat-Chrysler LLC

2:40 PM

Dynamic Hall-petch Effect in AISI 321 Austenitic Stainless Steel: Role of Grain Size and Deformation Mode: *Ahmed Tiarniyu*¹; Akindele Odeshi¹; Jerzy Szipunar¹; ¹University of Saskatchewan

3:00 PM Invited

The Application of Fracture Toughness Testing Using Vickers Indents: *Michael Keeble*¹; ¹Buehler

3:20 PM Break

3:40 PM Invited

Hardness Testing Per ASTM E18: Daniel Dennies¹; *James Lane*²; ¹DMS, Inc.; ²Professional Analysis and Consulting, Inc.

4:00 PM Invited

Evaluation of Hardness Test Blocks: *George Vander Voort*¹; ¹Vander Voort Consulting L.L.C.

4:20 PM Panel Discussion: The members of this panel shall represent various industries, ASTM and ISO committees, etc.; shall discuss the various types of hardness testing; and debate issues brought up by the moderator and the audience.

MONDAY PM

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

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

Monday PM
October 15, 2018

Room: A120
Location: Greater Columbus Convention Center

Session Chairs: Narsingh Singh, University of Maryland, Baltimore County

2:00 PM Invited

Development of Large Bandgap Materials Using Reactive Growth in Al-Si Eutectic for Optical and RF Applications: *Narsingh Singh*¹; Ching Hua Su²; Puneet Gill²; Bradley Arnold¹; Fow-Sen Choa¹; Brian Cullum¹; Kamdeo Mandal¹; Christopher Cooper¹; ¹University of Maryland, Baltimore County; ²NASA Marshall Space Flight Center

2:30 PM

Innovation of Graphene Fibre Composite Processing Using Pressurised Gyration: *Amalina Amir*¹; Harshit Porwal²; Suntharavathanan Mahalingam¹; Mohan Edirisinghe¹; ¹University College London; ²Queen Mary University of London

2:50 PM

Governing Mechanisms of Crack-Healing in Ceramic Materials: *Fariborz Tavangarian*¹; ¹Pennsylvania State University, Harrisburg

3:10 PM

In-situ High Temperature Micromechanical Testing of Ultrafine Grained Yttria-stabilized Zirconia Processed by Spark Plasma Sintering: Jaehun Cho¹; Jin Li¹; Qiang Li¹; Han Wang¹; Jie Ding¹; Sichuang Xue¹; Haiyan Wang¹; Troy Holland²; Amiya Mukherjee³; *Xinghang Zhang*¹; ¹Purdue University; ²Colorado State University; ³University of California, Davis

3:30 PM Break**3:50 PM**

Morphology Control of Metallic Coatings by Electrochemical Deposition: *Manoj Mahapatra*¹; Mark King¹; ¹University of Alabama at Birmingham

4:10 PM

Processing Effects on Dielectrics Produced via Aerosol Deposition: *Eric Patterson*¹; Scooter Johnson¹; Edward Gorzkowski¹; ¹U.S. Naval Research Lab

4:30 PM

Single Crystal Alpha-alumina Nanofibers: *Fateh Mikaeil*¹; ¹Ohio State University

4:50 PM

Physical, Structural and Optical Properties of Doped Vanadate Systems: *Savidh Khan*¹; Kulvir Singh¹; ¹Thapar Institute of Engineering and Technology

5:10 PM

Morphological Transition and Evolution of Shapes in Glassy State: Narsingh Singh¹; Fow-Sen Choa¹; Stacey Sova¹; Christopher Cooper¹; Brad Arnold¹; Lisa Kelly¹; K.D. Mandal²; Narayan Singh²; ¹University of Maryland, Baltimore County; ²Indian Institute of Technology (BHU) Varanasi

Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches — Structure & Chemistry

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

Monday PM
October 15, 2018

Room: A122
Location: Greater Columbus Convention Center

Session Chair: Hadas Sternlicht, Brown University

2:00 PM Invited

Electric Field Effects on Ceramic Grain Boundaries: Wei Qin¹; Lauren Hughes¹; *Klaus Van Benthem*¹; ¹University of California, Davis

2:30 PM Invited

Combining Density Functional Theory Calculations with Machine Learning for Multi-scale Insights into Mo Alloy Grain Boundaries: Richard Tran¹; Hui Zheng¹; Chi Chen¹; Xiangguo Li¹; Naixie Zhou¹; Jian Luo¹; *Shyue Ping Ong*¹; ¹University Of California, San Diego

3:00 PM Invited

Grain Boundary Microscopic Degrees of Freedom: The Key(s) to Understanding Radiation Damage?: *Mitra Taheri*¹; ¹Drexel University

3:30 PM Break**3:50 PM Invited**

The Effect of Grain Size and Grain Boundary Energy on Complexion Transitions: *Amanda Krause*¹; Animesh Kundu¹; Richard Vinci¹; Martin Harmer¹; ¹Lehigh University

4:10 PM

Applications of QTAIM toward an Understanding of Segregation Phenomena: *Malavikha Rajivmoorthy*¹; Michael Hoerner¹; John Speer¹; Mark Eberhart¹; ¹Colorado School of Mines

4:30 PM

Atomistic Modeling of Interfacial Segregation and Structural Transitions in Ternary Alloys: *Yang Hu*¹; Timothy Rupert¹; ¹University of California, Irvine

4:50 PM

Thermal Grooving Study of Grain-boundary Energies and Diffusion Mechanisms during Ni Coarsening in an SOFC-anode: *Patricia Haremski*¹; Matthias Wieler²; Anika Maruszczyk²; Michael Hoffmann³; Paul Hoffrogge⁴; Daniel Schneider⁵; Britta Nestler⁵; Piero Lupetin²; ¹Robert Bosch GmbH & Karlsruhe Institute of Technology; ²Robert Bosch GmbH; ³Karlsruhe Institute of Technology; ⁴Karlsruhe University of Applied Sciences; ⁵Karlsruhe University of Applied Sciences & Karlsruhe Institute of Technology

5:10 PM

Understanding Interfacial Behavior in Aluminum-carbon Hybrid Materials through Atomistic Modeling: *Christopher Shumeyko*¹; Daniel Cole¹; Christopher Weinberger²; ¹US Army Research Lab; ²Colorado State University



OCTOBER 14 – 18, 2018
 GREATER COLUMBUS CONVENTION CENTER
 COLUMBUS, OHIO, USA

International Symposium on Ceramic Matrix Composites — Testing and Damage Characterization

Program Organizers: Jitendra Singh, Retired, U.S. Army Research Laboratory; Narottam Bansal, National Aeronautics and Space Administration; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

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

Session Chair: George Jefferson, US Air Force Research Laboratory

2:00 PM

Characterization of SiC Fibers Creep in Air and Vacuum: *Amjad Almansour*¹; James Kiser¹; Ramakrishna Bhatt²; ¹NASA Glenn Research Center; ²Ohio Aerospace Institute at NASA Glenn Research Center

2:20 PM

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

2:40 PM

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

3:00 PM

Oxidation and Embrittlement of SiC/SiC Composites: *Ken Kawanishi*¹; Shinji Muto²; Ben Callaway³; Frank Zok³; ¹IHI INC.; ²IHI Corporation; ³University of California, Santa Barbara

3:20 PM Break

3:40 PM

Degradation of BN Interfaces in SiC-SiC Composites at Elevated Temperatures: *Evan Callaway*¹; Frank Zok¹; ¹University of California, Santa Barbara

4:00 PM

Mode I and Mode II Interlaminar Fracture Properties of a SiC/SiC Ceramic Matrix Composite: *Michael Presby*¹; Hariharan Rangarajan¹; Nkemjika Ike¹; Yogesh Singh¹; Gregory Morscher¹; Frank Abdi²; Sung Choi³; ¹The University of Akron; ²AlphaSTAR Corporation; ³Naval Air Systems Command

4:20 PM

Analyzing Damage Progression in SiC/SiC CMCs Using In-situ Microtomography: *Ashley Hilmas*¹; Kathleen Sevener¹; John Halloran¹; Michael Thouless¹; ¹University of Michigan

International Symposium on Defects, Transport and Related Phenomena — Defect and Novel Devices

Program Organizers: Tatsuya Kawada, Tohoku University; Manfred Martin, RWTH Aachen University; Sangtae Kim, University of California, Davis; William Chueh, Stanford University

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

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

2:00 PM Invited

Developments of New Lithium Ion Conductors and Their Application to All-solid-state Batteries: *Ryoji Kanno*¹; Satoshi Hori¹; Kota Suzuki¹; Masaaki Hirayama¹; ¹Tokyo Institute of Technology

2:40 PM Invited

Solid State Ionics Approach towards Artificial Intelligence: *Xin Guo*¹; ¹Huazhong University of Science and Technology

3:20 PM Break

3:40 PM Invited

Enhanced Photocatalytic Activities of Strontium Titanate by Oxygen Nonstoichiometry: *Yoshihiro Yamazaki*¹; ¹Kyushu University

4:20 PM

Study of the Modes of Adsorption and Electronic Structure of p-aminobenzoic Acid over (001) SrTiO₃ Crystal Surface: *Luis Villamagual*¹; Freddy Marcillo¹; Manuela Carini²; ¹Universidad Tecnica Particular de Loja; ²University of Calabria

4:40 PM

Measurement of Thermal Conductivity in GaN Thin Films and Interface Resistance between GaN and Its Substrate: *Vinay Chauhan*¹; Marat Khafizov¹; ¹The Ohio State University

Joining of Advanced and Specialty Materials (JASM XX) — Brazing of Advanced Materials

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

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

Session Chair: Michael Halbig, NASA Glenn Research Center

2:00 PM

Porous Nickel Interlayer Enabled Silver Brazing for Ceramic-ceramic Joining and/or Dual Atmosphere Stainless Steel-ceramic Joining: *Quan Zhou*¹; Lindsay Fricano¹; Yuxi Ma¹; Thomas Bieler¹; *Jason Nicholas*¹; ¹Michigan State University

2:20 PM

Interface Reaction and Wetting Kinetics of Ag-CuO Doped with TiO₂ over YIG Ceramics: *Wanqi Zhao*¹; Tiesong Lin¹; Peng He¹; Dusan P Sekulic²; ¹Harbin Institute of Technology; ²University of Kentucky

MONDAY PM

2:40 PM

Multiscale Modeling and Damage Zone Analysis of Ni-based Superalloy Brazed Joints for High Temperature Gas Turbine Engine Applications: *Jacob Wildofsky*¹; ¹The Ohio State University

3:00 PM

Effect of In Addition on the Thermal Property, Wettability and Interfacial Reaction of Novel Sn-Zn-Bi-In Lead-free Solder: *Jian-Chun Liu*¹; Xinhua Gao¹; Zhijun Yue¹; Haiyan Zhang¹; Gong Zhang²; Katsuaki Suganuma³; ¹China Ship Development and Design Center; ²Tsinghua University; ³Osaka University

3:20 PM Break

3:40 PM

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

4:00 PM

Silver Oxide Decomposition Assisted Direct Bonding of Silicon Carbide: *Tomoki Matsuda*¹; Keita Motoyama²; Tomokazu Sano²; Akio Hirose²; ¹Osaka University; ²Osaka Univ

4:20 PM

Seal Ring Method for High-temperature, High-pressure Metal to Ceramic Transitions: *Allyssa Bateman*¹; Yaiza Rodriguez¹; Luke Schoensee¹; Timothy Phero¹; Kyu Han²; Jesse Nachlas²; Brian Jaques¹; ¹Boise State University; ²HiFunda, LLC.

4:40 PM

Brazing WC-CO to Inconel 600 Using Carbon Nanotubes Reinforced Cu-Zn Filler Metal: *G. Castro-Sánchez*¹; G. Mendoza-Suarez¹; Jose Lemus-Ruiz¹; A.L. Drew²; ¹Universidad Michoacana de San Nicolás de Hidalgo; ²Concordia University

Joining of Advanced and Specialty Materials (JASM XX) — Friction Stir and Friction Welding I

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

Monday PM
October 15, 2018

Room: C171
Location: Greater Columbus Convention Center

Session Chairs: Yuri Hovanski, Brigham Young University; Judy Schneider, University of Alabama at Huntsville

2:00 PM Invited

Twenty Seven Years of Stirring It up – Metallically Speaking: *Judy Schneider*¹; ¹University of Alabama at Huntsville

2:30 PM

Utilizing Ultrasonic Thermometry to Monitor Friction Stir Welding Temperature Profiles: *Zachary Myers*¹; Judith Schneider¹; Donald Yuh²; ¹University of Alabama In Hunstville; ²Industrial Measurement Systems, Inc.

2:50 PM

Development of Methodology to Determine the Temperature Influence on Microstructure Evolution during Friction Stir Welding: *Anton Naumov*¹; Iurii Golubev¹; Fedor Isupov¹; Iuliia Morozova¹; Cornelius Spree¹; ¹Peter the Great St. Petersburg Polytechnic University

3:10 PM

Development of a Numerical Model for Dissimilar Joining by FSW: *Fumikazu Miyasaka*¹; Kenta Mitsufuji¹; ¹Osaka University

3:30 PM Break

3:50 PM

Friction Stir Welding of Hot Rolled and Annealed Armor Steel: *William Evans*¹; Martin McDonnell²; Antonio Ramirez¹; Mike Eff³; ¹The Ohio State University; ²TARDEQ; ³EWI

4:10 PM

Development of V-Alloy/SUS316L Dissimilar Joint Using Friction Stir Welding: *Hisashi Serizawa*¹; Hiroataka Ogura²; Yoshiaki Morisada¹; Hidetoshi Fujii¹; Hiroaki Mori²; Takuya Nagasaka³; ¹JWRI, Osaka University; ²Osaka University; ³National Institute for Fusion Science

4:30 PM

Microstructures and Mechanical Properties of FSW Joint of 430 MPa and 560 MPa Grade Steel: *Kohei Takeya*¹; Tomoki Matsuda¹; Tomokazu Sano¹; Akio Hirose¹; Atsushi Takada²; Muneo Matsushita²; Naoya Hayakawa²; Rinsei Ikeda²; ¹Osaka University; ²JFE Steel Corporation

4:50 PM

High-frequency Linear Friction Welding of Aluminum Alloys and Stainless Steel: *Hironobu Adachi*¹; Tomoki Matsuda¹; Tomokazu Sano¹; Akio Hirose¹; Ryo Yoshida²; Hisashi Hori²; Qinglong Pan³; Hikotaro Ochiai³; Shozo Ono³; ¹Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University; ²Nippon Light Metal Company, Ltd.; ³Mitsui Engineering & Shipbuilding Co., Ltd.

5:10 PM

Influence of Microstructure on the Fracture Behavior of Friction Stir Spot Welded Joint between Zinc Coated Steel and 6061 Aluminum Alloy: *Kiriko Owada*¹; Tomoki Matsuda¹; Tomokazu Sano¹; Akio Hirose¹; Asahi Numata¹; Hiroto Shoji¹; Mitsuru Ohata¹; ¹Osaka University

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

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

Monday PM
October 15, 2018

Room: B130
Location: Greater Columbus Convention Center

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

2:00 PM Keynote

Advanced Titanium Alloys with Tailored Properties for Aerospace and Automotive Applications: *Carsten Siemers*¹; Florian Brunke¹; Martin Bäker¹; ¹Technische Universität Braunschweig / Institute for Materials

2:40 PM

Orientation Dependent Spheroidization Response of α -colonies during Sub β -transus Annealing of Ti-6Al-4V Alloy: *Shibayan Roy*¹; Satyam Suwas²; ¹Materials Science Center, Indian Institute of Technology Kharagpur; ²Department of Materials Engineering, Indian Institute of Science, Bangalore



OCTOBER 14 – 18, 2018
 GREATER COLUMBUS CONVENTION CENTER
 COLUMBUS, OHIO, USA

3:00 PM

Superplasticity and Constitutive Relationship in a Ti-based Metallic Glassy Composite: *Wang Y.S.*

3:20 PM Break

3:40 PM

Redesigning AA6201 Aluminum Alloy to Achieve a Combination of High Strength, Electrical Conductivity and Thermal Stability: Vincent Jansen¹; Francisco Flores¹; David Dunand²; Nhon Vo¹; ¹NanoAl; ²Northwestern University

4:00 PM

Development of Ultra-conductive Aluminum Alloys as Low-weight Electrical Conductors in Transportation Applications: *Keerti Kappagantula*¹; Aditya Nittala¹; Frank Kraft¹; ¹Ohio University

4:20 PM

High-temperature Performance of 3000-series Aluminum Alloys with Addition of Thermally Stable Nano-precipitates: *Francisco Flores*¹; Evander Ramos²; David Dunand³; Nhon Vo²; ¹NanoAl LLC; ²NanoAl; ³Northwestern University

4:40 PM

Microstructure and Mechanical Properties of Al-Mg Alloys with High Contents of Mg: *Yaojun Lin*¹; Jiani Sun²; Zhigang Yan³; Zhibo Liu²; ¹Wuhan University of Technology; ²Wuhan University of Technology; ³Yanshan University

5:00 PM

Effect of Alternate Drawing on the Ductility of Drawn Wires for Aluminum Wire Harness: *Chihiro Takuma*¹; Kazunari Yoshida¹; ¹Tokai University

Materials for Nuclear Applications and Extreme Environments — Radiation Effects on Materials’ Structure and Properties

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

Monday PM
 October 15, 2018

Room: D183
 Location: Greater Columbus Convention Center

Session Chair: Karl Whittle, University of Liverpool

2:00 PM

Microstructural Evolution of NFA and Cr₃C₂@SiC-NFA Derived Materials under Thermal Treatment: *Kaustubh Bawane*¹; *Kathy Lu*¹; ¹Virginia Tech

2:20 PM

Microstructural and Conductivity of Second-generation High Temperature Superconductors Irradiated at ORNL’s HFIR: *Philip Edmondson*¹; ¹Oak Ridge National Laboratory

2:40 PM

Phase Field Study of the Formation Mechanism of Gas Bubble Superlattice in Irradiated Materials: *Yipeng Gao*¹; Daniel Schwen¹; Chao Jiang¹; Yongfeng Zhang¹; ¹Idaho National Laboratory

3:00 PM

Influence of the Enthalpy Landscape on the Irradiation-induced Disorder of Minerals: N. M. Anoop Krishnan¹; *Mathieu Bauchy*²; ¹IIT Delhi; ²University of California, Los Angeles

3:20 PM Break

3:40 PM

Post Irradiation Annealing Kinetics and Mechanisms in RPV Steels with Nanoscale Mn-Ni-Si Precipitates: *Nathan Almira*¹; Shipeng Shu²; Peter Wells¹; Takuya Yamamoto¹; Dane Morgan²; Soupitak Pal¹; G. R. Odette¹; ¹University of California Santa Barbara; ²University of Wisconsin-Madison

4:00 PM

Quantification of Defects Using Raman Spectroscopy in Low Dose Irradiation in 3C-SiC: *Vinay Chauhan*¹; Marat Khafizov¹; ¹The Ohio State University

4:20 PM

Two-temperature Model Simulations of High Energy Cascades: *Eva Zarkadoul*¹; German Samolyuk¹; William Weber²; ¹Oak Ridge National Laboratory; ²University of Tennessee

4:40 PM

Radiation Effects in Binary Carbides: *Karl Whittle*¹; ¹University of Liverpool

5:00 PM

Radiation Response of Nanoporous Metals: *Xinghang Zhang*¹; Jin Li¹; ¹Purdue University

Materials Issues in Nuclear Waste Management — Nuclear Waste Form Processing and Synthesis II

Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Jason Lonergan, Washington State University; Jake Amoroso, Savannah River National Laboratory; Yutai Katoh, Oak Ridge National Laboratory; Kevin Fox, Savannah River National Laboratory; Josef Matyas, Pacific Northwest National Laboratory

Monday PM
 October 15, 2018

Room: D282
 Location: Greater Columbus Convention Center

Session Chair: Devon McClane, Savannah River National Laboratory

2:00 PM Invited

Increasing the Liquor Throughput of the UK Vitrification Plants: *Nick Gribble*¹; James Stevens¹; ¹Natioanl Nuclear Laboratory

2:40 PM

Silver Functionalized Silica Aerogel: Effect of Aging on Iodine Sorption Performance: *Josef Matyas*¹; Eugene Ilton¹; Libor Kovarik¹; ¹PNNL

3:00 PM

The Feasibility of Melt-processing Ceramic Waste Forms for High-level Waste: *Jake Amoroso*¹; Christopher Dandeneau¹; ¹Savannah River National Laboratory

3:20 PM Break

3:40 PM Invited

Vitrification of Highly Active Waste Streams in the UK: the Zirconium Molybdate Hydrate (ZMH) Challenge: *Donna McKendrick*¹; ¹National Nuclear Laboratory

4:20 PM Invited

Fabrication of Ceramic Technetium Waste Forms: *Thomas Hartmann*¹; ¹University of Nevada, Las Vegas

MONDAY PM

Materials Property Understanding through Characterization — Metals I

Program Organizers: Indrajit Dutta, Corning Incorporated; Nicholas Smith, Corning Incorporated

Monday PM
October 15, 2018

Room: B240/241
Location: Greater Columbus Convention Center

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

2:00 PM Invited

Dynamic Physical Simulation of Cr-Mo Steel at Elevated Temperatures: *Adam Foltz*¹; Stephen Bartolucci¹; ¹US Army ARDEC

2:40 PM

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

3:00 PM Invited

Microstructure Characterization of Electrodeposited Nickel Tested at High Strain Rates: *Jonathan Ligda*¹; Daniel Casem¹; Heather Murdoch¹; ¹US Army Research Laboratory

3:40 PM Break

4:00 PM

Influence of Cryogenic Treatment on Electrical and Thermal Properties of Gray Cast Iron: *Susil Putatunda*¹; *Deepak Joshi*¹; James Boileau²; ¹Wayne State University; ²Ford Motor Company

4:20 PM

Quantitative Assessment of Short-range Order in Magnetostrictive Fe-rich Binary Alloys: *Richard Laroche*¹; Travis Willhard¹; Sivaraman Guruswamy¹; ¹University of Utah

4:40 PM

Statistical Modeling of Effect of Porosities on Mechanical Behavior of High Performance Cast Metals: *Mustafa Rifat*¹; Robert Voigt¹; Saurabh Basu¹; ¹Penn State

Next Generation Biomaterials — Biomaterials II

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

Monday PM
October 15, 2018

Room: D182
Location: Greater Columbus Convention Center

Session Chairs: Pelagia Gouma, The Ohio State University; James Earthman, University of California, Irvine

2:00 PM

Growth Factor-encapsulated and Cell-laden Scaffolds for Gastrointestinal Tract Regeneration: *Lin Guo*¹; *Min Wang*¹; ¹The University of Hong Kong

2:20 PM Invited

High-throughput Electrospinning of Advanced Biomaterials: *Pelagia Gouma*¹; ¹The Ohio State University

2:40 PM Invited

Making Antimicrobial Fibrous Patches and Filters using Novel Electrohydrodynamics and Pressurised Gyration Devices: *Mohan Edirisinghe*¹; ¹University College of London

3:00 PM Invited

Precision Assembly through Tunable Interfaces: *Candan Tamerler*¹; ¹University of Kansas

3:20 PM Break

3:40 PM Invited

Quantitative Percussion Diagnostics of Cracks and Other Closed Defects: A New Paradigm in Dentistry and Beyond: *Aboozar Mapar*¹; *Alejandra Lopez*¹; *Heejun Clough*¹; *Cherilyn Sheets*²; *James Earthman*¹; ¹University of California, Irvine; ²Newport Coast Oral Facial Institute

4:00 PM Invited

Synergistic Combination of Surface Texturing and Nitric Oxide Release to Improve Biomaterial Resistance to Infection and Coagulation: *Lichong Xu*¹; *Christopher Siedlecki*¹; ¹Penn State College of Medicine

4:20 PM Invited

The Antioxidant Role of Silicon in the Reduction of Oxidative Damage to Bone and Vascular Cells: *Venu Varanasi*¹; *Felipe Monte*²; *Pranesh Aswath*²; *Harry Kim*³; ¹Texas A&M HSC; ²University of Texas at Arlington; ³Texas Scottish Rite Hospital

4:40 PM

Synthesis, Characterization, and In Vitro Study of Drug Loaded Biodegradable Magnesium Alloys for Anti-inflammatory Implantable Applications: *Zia Ur Rahman*¹; *Waseem Haider*¹; ¹Central Michigan University

Perspectives for Emerging Materials Professionals — Session II

Program Organizers: Andrew Frerichs, The NanoSteel Company; Dharma Maddala, Arconic Technology Center

Monday PM
October 15, 2018

Room: B231
Location: Greater Columbus Convention Center

Session Chair: Andrew Frerichs, The NanoSteel Company

2:00 PM

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

2:20 PM

International Experience: Preparing American Engineers with Global Perspective: *Mufit Akinc*¹; ¹Iowa State University

2:40 PM Invited

No Speed Limit! How to Fast Track Your Scientific Career by Taking a Detour through Germany: *Carl Krill*¹; ¹Ulm University

3:00 PM

Making Time to Think at Work: *Daniel Miracle*¹; ¹Air Force Research Laboratory

3:20 PM Break

3:40 PM Invited

Making the Most of Mentoring: *Emily Kinser*¹; ¹IBM

4:00 PM

Scientific and Technical Leadership in Government Labs: *Daniel Miracle*¹; ¹Air Force Research Laboratory



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4:20 PM

The Power of Attitudes: *Cullen Hackler*¹; ¹Porcelain Enamel Institute Inc.

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

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

Monday PM

October 15, 2018

Room: A125

Location: Greater Columbus Convention Center

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

2:00 PM Invited

Energy and Productivity Potential of Electrotechnologies in Industrial Process Heating Systems: *Joe Cresko*¹; Arvind Thekdi²; Kiran Thirumaran³; Sachin Nimbalkar³; ¹DOE Advanced Manufacturing Office; ²E3M Inc; ³Oak Ridge National Laboratory

2:40 PM Invited

Biofilm Formation Behaviors Formed by E.Coli and S. Epidermis under Weak Alternating Electromagnetic Fields: *Hideyuki Kanematsu*¹; Takaya Katsuragawa¹; Dana Barry²; Senshin Umeki³; Akiko Ogawa¹; Nobumitsu Hirai¹; Takeshi Kougo¹; Yoshimitsu Mizunoe⁴; ¹National Institute of Technology, Suzuka College; ²Clarkson University; ³Tohoku University; ⁴The Jikei University School of Medicine

3:20 PM Break

3:40 PM Invited

Investigating Far-from-equilibrium Effects of External Electric Fields In Ceramics Processing: *B. Reeya Jayan*¹; ¹Carnegie Mellon University

4:20 PM

Utilization of Magnetic Fields and Mechanical Loads in the Fabrication of Enhanced Alnico Magnets with Near-Final Shape: *Emily Rinko*¹; Iver Anderson²; Aaron Kassen¹; Emma White²; Wei Tang²; Lin Zhou²; Matthew Kramer²; ¹Iowa State Univ; ²Ames Laboratory

4:40 PM

Effects of Pore Size and Heating Method on Drying Porous Fused Silica: *Peter Loomis*¹; ¹Virginia Polytechnic Institute

5:00 PM

Microwave Enhanced Digestion of Gibbsite in Sodium Hydroxide: *Ben Dillinger*¹; David Clark¹; Carlos Suchicital¹; Sam Kingman²; Andrew Batchelor²; Chris Dodds²; ¹Virginia Polytechnic Institute and State University; ²University of Nottingham

5:20 PM

Effect of Electric Current Pulse Treated above Liquidus on Microstructure and Properties of Primary Carbide in Hypereutectic High Cr Cast Irons: *Geng Bao Yu*¹; Zhou RongFeng¹; ¹Kunming University of Science and Technology

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

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

Monday PM

October 15, 2018

Room: A213

Location: Greater Columbus Convention Center

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

2:00 PM Invited

Modeling of Solidification and Precipitation in Magnesium Alloys: *Alan Luo*¹; Jiashi Miao¹; Chuan Zhang²; ¹The Ohio State University; ²CompuTherm LLC

2:20 PM Invited

Thermodynamic Assessment of Slag-matte-metal Equilibria in the Cu-Fe-Al-Ca-Mg-Si-O-S System for Pyrometallurgical Production of Copper: *Sergei Decterov*¹; Denis Shishin²; Evgueni Jak²; ¹Ecole Polytechnique De Montreal; ²Pyrosearch, University of Queensland

2:40 PM Invited

Gibbs, Schreinemakers, and Mechanisms to Form Three-phase Miscibility Gaps: *Shuanglin Chen*¹; John Morral²; ¹CompuTherm LLC; ²The Ohio State University

3:00 PM Invited

Multicomponent Phase Equilibria and Diffusion: Critical Knowledge in Alloy Development for Additive Manufacturing: *Yongho Sohn*¹; Le Zhou¹; ¹University of Central Florida

3:20 PM Break

3:40 PM Invited

Computational Modeling of High-Entropy Alloys: *Michael Gao*¹; Jeffrey Hawk¹; David Alman¹; Mike Widom²; ¹National Energy Technology Lab; ²Carnegie Mellon University

4:10 PM

CALPHAD Modeling of the Molar Volume: *Ursula Kattner*¹; ¹National Institute of Standards & Technology

4:30 PM

Computational Investigations of Interface Stability between Thermoelectric Materials Yb14MnSb11 and Co: *XiaoYu Chong*¹; Jorge Paz Soldan Palma¹; Yi Wang¹; Drymiotis Fivos²; Kurt Star²; Jean-Pierre Fleurial²; Vilupanur Ravi²; Zi-Kui Liu¹; ¹Pennsylvania State University; ²Jet Propulsion Laboratory

4:50 PM

Effect of Composition Dependent Molar Volume on Accuracy of Interdiffusion Analysis in Multicomponent Systems: *Aparna Tripathi*¹; *Kaustubh Kulkarni*²; ¹Indian Institute of Technology Kanpur; ²Indian Institute of Technology Kanpur

5:10 PM

In/Bi2(Se,Te)3 Interfacial Reactions and Bi-In-Se-Te Phase Diagram: *Sinn-wen Chen*¹; Yohanes Hutabalian²; ¹National Tsing Hua University; ²Department of Chemical Engineering, National Tsing Hua University

MONDAY PM

Rare Earth Metals and Critical Materials: Synthesis, Processing, Production, Recent Advances — Rare Earth Magnets and Critical Materials

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

Monday PM
October 15, 2018

Room: B131
Location: Greater Columbus Convention Center

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

2:00 PM Invited

Are Rare Earths Critical for the Electrification of Motor Vehicles?: *Jack Lifton*¹; ¹Jack Lifton, LLC

2:40 PM Invited

Current Technology Status and Future Needs for Rare Earth Permanent Magnets for Industrial Applications: *John Ormeord*¹; ¹JOC LLC

3:20 PM Break

3:40 PM

Thermomagnetic Processing and Differential Scanning Calorimetry of Permanent Magnet Materials: *Michael Kesler*¹; Orlando Rios¹; Brandt Jensen²; Ikenna Nlebedim²; Scott McCall³; Alexander Baker³; Matthew Kramer²; Lin Zhou²; Michael McGuire¹; ¹Oak Ridge National Laboratory; ²Ames Laboratory; ³Lawrence Livermore National Laboratory

4:10 PM

Separation of Rare Earth from Nd-Fe-B Magnet Scraps Using Molten Salt Electrolysis: *Hirokazu Konishi*¹; Hideki Ono¹; Tetsuo Oishi²; Toshiyuki Nohira³; Yuichiro Koizumi¹; ¹Osaka University; ²National Institute of Advanced Industrial Science and Technology; ³Kyoto University

4:40 PM

Pyrometallurgical Recycling of NdFeB Magnet Scraps by Using Silicon Wafer Cutting Sludge: *Kim Jong Ho*¹; ¹Rist

Responsive Functional Nanomaterials — Responsive Smart Nanomaterials

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

Monday PM
October 15, 2018

Room: D181
Location: Greater Columbus Convention Center

Session Chair: Jiahua Zhu, University of Akron

2:00 PM

Boosting Thermal Conduction in Polymers by Lowering Inter-chain Thermal Resistance via Organic Molecules: *Nitin Mehra*¹; Marjan Kashfipour¹; Jiahua Zhu¹; ¹University of Akron

2:20 PM

Computational Design of Thermochromic Film for Building Energy Efficiency: Influence of Particle Size, Shape, and Concentration: *Jianying Hu*¹; Xiong Yu¹; ¹Case Western Reserve University

2:40 PM

Field-effect Transistors Made from Solution-grown Two-dimensional Tellurene: *Yixiu Wang*¹; Gang Qiu¹; Ruoxing Wang¹; Peide Ye¹; Wenzhuo Wu¹; ¹Purdue University

3:00 PM

Electrically and Thermally Triggered Three-dimensional Graphene Foam-reinforced Shape Memory Epoxy Composites: *Adeyinka Idowu*¹; Benjamin Boesl¹; Arvind Agarwal¹; ¹Florida International University

3:20 PM Break

3:40 PM

Embedding Conductive Nanomaterials into Polymers by Direct Printing for Flexible Pressure Sensors: *Rachel Aga*¹; Roberto Aga²; Emily Heckman²; ¹Wright State University; ²Air Force Research Laboratory

4:00 PM

Highly Deformable Hierarchical Heterostructure Printed Liquid Electrode Self-assembled Two-dimensional Semiconductor for Wearable Electronics and Sensors: *Ruoxing Wang*¹; Wenzhuo Wu¹; ¹Purdue University

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

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

Monday PM
October 15, 2018

Room: A220
Location: Greater Columbus Convention Center

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

2:00 PM Keynote

Cast Alumina-forming Stainless Steels for High Temperature Corrosive Environments: *Govindarajan Muralidharan*¹; Yukinori Yamamoto²; Michael Brady²; Donovan Leonard²; Ercan Cakmak²; Tanya Ros³; Stanley Fauske⁴; Garrett Hadley⁵; Roman Pankiw⁵; Jim Myers⁶; ¹Oak Ridge National Laboratory; ²Oak Ridge National Lab; ³ArcelorMittal Global R & D; ⁴ArcelorMittal Coatesville; ⁵Duraloy Technologies; ⁶MetalTek International

2:40 PM

Galvanic Corrosion Resistance of Mixed-material Joints Fabricated by Resistance Spot Riveting: *Paul Krell*¹; Jenifer Locke¹; ¹The Ohio State University

3:00 PM

Crevice Corrosion: A Critical Degradation Mechanism in Reinforced Concrete: *Lei Yan*¹; Guangling Song¹; Dajiang Zheng¹; ¹Center for Marine Materials Corrosion and Protection, Xiamen University

3:20 PM Break

3:40 PM

Understanding the Effect of Anodic Polarization on SCC Resistance of AA6111 to Simulate Coupling with CFRP for Automotive Applications: *Katrina Cattedge*¹; Jenifer (Warner) Locke¹; ¹The Ohio State University

4:00 PM

Overview of an Innovative Approach to SCC Inspection and Evaluation of Canister in Dry Storage: *Zeev Shayer*¹; ¹Colorado School of Mines



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4:20 PM

The Corrosion Behavior of Mg in Marine Environment: *Fuyong Cao*¹; Guang-Ling Song¹; Chen Zhao¹; Jing You¹; ¹Xiamen University

Sintering and Related Powder Processing Science and Technologies — Miscellaneous Sintering Topics

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

Monday PM
October 15, 2018

Room: B142/143
Location: Greater Columbus Convention Center

Session Chair: Christopher Marvel, Lehigh University

2:00 PM Invited

Simulation of Solid-state Sintering: A Phase-field Approach: *Johannes Hötzer*¹; Marco Seiz²; Veronika Rehn²; Michael Kellner²; Britta Nestler²; ¹Karlsruhe University Of Applied Science; ²Karlsruhe Institute of Technology

2:40 PM

Sinter-cracking in 3D Printed Green Bodies: *Zachary Cordero*¹; Reid Carazzone¹; ¹Rice University

3:00 PM

Rapid Sintering of Cerium Oxide Ceramics: Nimrod Yavo¹; Asaf Nissenbaum¹; Tal-El Shaul¹; Ellen Wachtel¹; Orit Mendelson²; Giora Kimmel³; *Igor Lubomirsky*¹; Ori Yeheskel²; ¹Weizmann Institute Of Science; ²Nuclear Research Center Negev; ³Ben Gurion University

3:20 PM

Effect of Excess B₂O₃ on the Density, Microstructure, and Hardness of Reactively Hot-pressed Boron Suboxide: *Kristopher Behler*¹; Howard Payne²; Jerry LaSalvia³; Chris Marvel⁴; Scott Walck⁵; W. Shoulder⁴; Lionel Vargas-Gonzalez³; Martin Harmer⁴; ¹US Army Research Laboratory (Survice Engineering); ²ARL (CQL); ³ARL; ⁴Lehigh University; ⁵Arl (Survice Engineering)

3:40 PM Break

4:00 PM

Study on Joining Process of Sulfide Dispersed Bronze and Steel Plate: *Hirokazu Yamasaki*¹; Tomohiro Sato¹; Masanori Takuma¹; Ken-ichi Saitou¹; Yoshimasa Takahashi¹; ¹Kansai University

4:20 PM

Synthesis of TaB₂ Ceramics by Reduction of Ta₂O₅ with B₄C: *Melis Kaplan*¹; Onuralp Yucel¹; Filiz Sahin¹; Gultekin Goller¹; Ipek Akin¹; ¹Istanbul Technical University

4:40 PM

Fractal Correction of Coble's Sintering Model: *Vojislav Mitic*¹; Ljubiša Kocić¹; Vesna Paunovic¹; Goran Lazovic²; Zoran Nikolic¹; ¹University of Nis; ²University of Belgrade

Small-scale Properties of Materials and Length-scale Phenomena — In-situ Assessments

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

Monday PM
October 15, 2018

Room: A121
Location: Greater Columbus Convention Center

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

2:00 PM Invited

In-situ Stable Fracture of Ceramic Interfaces: *Finn Giuliani*¹; ¹Imperial College London

2:20 PM Invited

Dislocation Transmission through Grain Boundaries: Insights from In-situ Micromechanical Experiments: *Gerhard Dehm*¹; Natalya Malyar¹; Christoph Kirchlechner¹; ¹Max-Planck-Institute

2:40 PM Invited

In-situ Deformation Behavior of Metallic Glass Composites at the Small Length-scales: Vahid Hasannaemi¹; Saideep Muskeri¹; *Sundeep Mukherjee*¹; ¹University of North Texas

3:00 PM Invited

In-situ Mechanics of a Super-lightweight and Ultra-stiff 3D Graphene-Metal Metamaterial: Pranjal Nautiyal¹; Mubarak Mujawar¹; Benjamin Boesl¹; *Arvind Agarwal*¹; ¹Florida International University

3:20 PM Break

3:40 PM Invited

In-situ Microcompression Transient Plasticity and Fatigue Tests for Reliable Extraction of Deformation Activation Parameters: Creep, Stress Relaxation, Strain Rate Sensitivity and High Cycle Fatigue Tests: *Gaurav Mohanty*¹; Johann Michler²; ¹Tampere University of Technology; ²Empa - Swiss Federal Laboratories for Materials Science and Technology

4:00 PM Invited

Specimen Considerations in Quantitative In-situ Micromechanical Testing: *Robert Wheeler*¹; ¹Microtesting Solutions LLC

4:20 PM

In-situ TEM Investigations of Ductile Thin Films on Brittle Substrates: Role of Film Microstructure on Interface Stability: *Alice Lassnig*¹; Christoph Gammer¹; Velislava Terziyska²; Tanja Jörg²; Daniel Kiener²; Christian Mitterer²; Megan Cordill¹; ¹Erich Schmid Institute of Materials Science; ²Montanuniversität Leoben

4:40 PM Invited

Atomic-scale Insights into Contacts between Nanoscale Bodies: In-situ Experiments and Matched Atomistic Simulations: *Tevis Jacobs*¹; Sai Bharadwaj Vishnubhotla¹; Subarna Khanal¹; Rimei Chen²; Xiaoli Hu²; Ashlie Martini²; ¹University of Pittsburgh; ²University of California, Merced

5:00 PM Invited

Enhanced fracture Toughness of Ceramic Coated Carbon Nanotube Foams through Efficient Stress Delocalization: An In-situ Study: *Atieh Moridi*¹; Cem Tasan¹; John Hart¹; ¹Massachusetts Institute of Technology

5:20 PM Invited

In-situ Spectroscopic Analysis of the Indentation-induced Phase Transformation of Crystalline and Amorphous Silicon Thin Films by Raman Spectroscopy Enhanced Indentation Technique (RS-IT): *Yvonne Gerbig*¹; Chris Michaels¹; Robert Cook¹; ¹National Institute of Standards and Technology

MONDAY PM

Surface Properties of Biomaterials — Biomedical Devices for Tissue Engineering and Regenerative Medicine

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

Monday PM
October 15, 2018

Room: D281
Location: Greater Columbus Convention Center

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

2:00 PM Invited

Bone-muscle Crosstalk: The Power of the “Kines” and Their Future Tissue Engineering Applications: ChengLin Mo¹; Jian Huang¹; Zhiying Wang¹; Leticia Brotto¹; Lynda Bonewald¹; Venu Varanasi¹; Marco Brotto¹; ¹University of Texas at Arlington

2:40 PM Invited

3D Live Printed Gelatin and Chitosan Nanosilicate Scaffolds for Bone and Vascular Regeneration: Venu Varanasi¹; Taha Azimaie¹; Azhar Ilyas²; Tugba Cebe³; Phillip Kramer¹; Neelam Ahuja¹; ¹Texas A&M HSC; ²New York Institute of Technology; ³University of Texas at Arlington

3:20 PM Break

3:40 PM

Starch-hydroxyapatite Based Bone Scaffolds Using a Slurry Based 3D Printer: Caitlin Koski¹; Bonny Onuik¹; Amit Bandyopadhyay¹; Susmita Bose¹; ¹Washington State University

4:00 PM

Osteogenic Silicon Nitride Implants for Rapid Biomineral Formation: Neelam Ahuja¹; Kamal Awad¹; Pranesh Aswath¹; Venu Varanasi²; ¹University of Texas at Arlington; ²Texas A&M College of Dentistry

4:20 PM

Compounded PEEK/Silicon Nitride Composite Exhibits Enhanced Osteoconductivity and Bacteriostasis: Ryan Bock¹; Giuseppe Pezzotti²; Wenliang Zhu²; Elia Marin²; Alfredo Rondinella²; Francesco Boschetto²; Bryan McEntire¹; B. Sonny Bal³; ¹Amedica Corporation; ²Kyoto Institute of Technology; ³University of Missouri

4:40 PM

Additive Manufacturing of Heterogeneous Bio-resorbable Constructs for Soft Tissue Applications: Parimal Patel¹; Panos Shiakolas¹; Prashanth Ravi¹; Tre Welch²; Tushar Saini¹; ¹University of Texas at Arlington; ²University of Texas Southwestern Medical Center

5:00 PM

Antimicrobial Property of Zn Doped Hydroxyapatite: Arjak Bhattacharjee¹; Anshul Gupta¹; Prem Murugan¹; Pradyut Sengupta²; Saravanan Matheshwaran¹; Indranil Manna³; Kantesh Balani¹; ¹IIT Kanpur; ²IMMT Bhubaneswar; ³IIT Kharagpur

Symposium on Large Fluctuations and Collective Phenomena in Materials VI - Mean Field Theory and Other Theoretical Models — Mean Field Theory and Other Theoretical Models

Program Organizers: Peter Liaw, University of Tennessee; Karin Dahmen, University of Illinois at Urbana Champaign; Xie Xie, FCA US LLC; Yong Zhang, University of Science and Technology Beijing

Monday PM
October 15, 2018

Room: B235
Location: Greater Columbus Convention Center

Session Chair: Peter Liaw, The University of Tennessee

2:00 PM Invited

Effect of Microstructural Features, Strain Rate and Temperature on the Deformation Mechanism of Al-Mg-Sc Alloy: Mageshwari Komarasamy¹; Rajiv Mishra¹; ¹University of North Texas

2:20 PM Invited

Characteristic Orientation Relationships and Unusual Deformation Mechanisms in Al-Al₂Cu Nano-laminates: Jian Wang¹; Shujuan Wang²; Guisen Liu¹; Amit Misra²; ¹University of Nebraska-Lincoln; ²University of Michigan

2:40 PM Invited

Serrated Flow in AlMgCuZn-based Lightweight High Entropy Alloys: Yong Zhang¹; ¹Beijing University of Science and Technology

3:00 PM

Shear-band Dynamics in Bulk Metallic Glasses by Thermal Imaging: Xie Xie¹; Yu-Chieh Lo²; Yang Tong³; Junwei Qiao⁴; Gongyao Wang¹; Shigenobu Ogata⁵; Hairong Qi¹; Karin Dahmen⁶; Yanfei Gao⁷; Peter Liaw⁸; ¹The University of Tennessee; ²National Chiao Tung University; ³City University of Hong Kong; ⁴Taiyuan University of Technology; ⁵Osaka University; ⁶University of Illinois at Urbana Champaign; ⁷The University of Tennessee; Oak Ridge National Laboratory; ⁸The University of Tennessee

3:20 PM Break

3:40 PM

Nanoscale Serration and Creep Characteristics of Al_{0.5}CoCrCuFeNi High-entropy Alloys: Shuying Chen¹; Weidong Li¹; Xie Xie¹; Jamieson Brechtl¹; Bilin Chen¹; Peizhen Li²; Guangfeng Zhao²; Fuqian Yang²; Junwei Qiao³; Karin Dahmen⁴; Peter Liaw⁵; ¹The University of Tennessee; ²University of Kentucky; ³Taiyuan University of Technology; ⁴University of Illinois at Urbana Champaign; ⁵University of Tennessee

4:00 PM Invited

Scaling Behaviors of Serrated Flows in Bulk Metallic Glasses: Junwei Qiao¹; Jiaojiao Li¹; Zhong Wang¹; Yucheng Wu¹; Peter Liaw²; Karin Dahmen³; ¹Taiyuan University of Technology; ²University of Tennessee; ³University of Illinois at Urbana Champaign

4:20 PM Invited

A Comprehensive Analysis of the Serration Behavior in Multi-principle Element Systems: Jamieson Brechtl¹; Xie Xie¹; Shuying Chen¹; Zhong Wang²; Rui Feng¹; Haoyan Diao¹; Bilin Chen¹; Yunzhu Shi³; Karin Dahmen⁴; Peter Liaw¹; Steven Zinkle¹; ¹University of Tennessee; ²Taiyuan University of Technology; ³University of Science and Technology Beijing; ⁴University of Illinois Urbana-Champaign

4:40 PM Invited

Plastic Dynamics of the High Entropy Alloy at Cryogenic Temperatures: Jingli Ren¹; ¹Zhengzhou University



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

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

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

Monday PM
October 15, 2018

Room: B144/145
Location: Greater Columbus Convention Center

Session Chair: Winnie Wong-Ng, National Institute of Standards and Technology

2:00 PM Invited

Gas Adsorption and Transport in Nanoporous Materials for Sustainable Hydrocarbon Recovery and Compressed Fluid Storage in Unconventional Environments: *Greeshma Gadikota*¹; ¹University of Wisconsin, Madison

2:20 PM Invited

Porous Manganese Dioxide Octahedral Molecular Sieve (OMS): *Lan Li*¹; Winnie Wong-Ng²; ¹Boise State University; ²National Institute of Standards and Technology (NIST)

2:40 PM Invited

Energetics of Guest – host Interactions: *Di Wu*¹; ¹Washington State University

3:00 PM

Pulsed Electrodeposition of Gas-diffusion Electrocatalysts for Carbon Dioxide Reduction: *Brian Skinn*¹; Sujat Sen²; McLain Leonard²; Rajeswaran Radhakrishnan¹; Dan Wang¹; Antoni Forner Cuenca²; Timothy Hall¹; Stephen Snyder¹; Fikile Brushett²; E Taylor¹; ¹Faraday Technology, Inc.; ²Department of Chemical Engineering, Massachusetts Institute of Technology

3:20 PM Break

3:40 PM Invited

Mixed Conductor Membrane Reactor for Carbon Capture and Oxidative Dehydrogenation of Ethane into Ethylene: Peng Zhang¹; *Kevin Huang*¹; ¹University of South Carolina

4:00 PM Invited

High Temperature Stability of Porous Carbonated Wollastonite (β-CaSiO₃): *Daniel Kopp*¹; Rudresh Gowda¹; Ryan Anderson¹; Jun Wang¹; Kevin Blinn¹; Richard Riman¹; ¹Rutgers University

4:20 PM

Characterization of Coal Fly Ash for the Production of Coagulant for Usage in Wastewater Treatment: *Momboyo Clotilde Apua*¹; Geoffrey S. Simate¹; ¹University of the Witwatersrand

4:40 PM

A Simple Fabrication of Stearic Acid Functionalized Polypyrrole Encapsulated Melamine Formaldehyde (SA/PPy/MF) Superhydrophobic/Superoleophilic Macroporous Sponge for Oil-water Separation: M Gopinath¹; Love Dashairya¹; *Partha Saha*¹; ¹NIT Rourkela

User-related Failures — Transportation

Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

Monday PM
October 15, 2018

Room: A210
Location: Greater Columbus Convention Center

Session Chairs: Matthew Fox, National Transportation Safety Board; Joseph Lemberg, Exponent; William Carden, Mcswain Engineering; Craig Clauser, Craig Clauser Engineering Consulting; Dale Alexander, Engineering Systems Incorporated

2:00 PM

Failure Analysis of a Propeller from a Curtiss Jenny: *Matthew Fox*¹; ¹National Transportation Safety Board

2:20 PM

Investigation of a Compressor Turbine Blade Failure Involving the Fir Tree Attachment Condition: *Ellen Wright*¹; Gary Novak¹; Richard Baron¹; David Ahearn¹; Dale Alexander¹; ¹Engineering Systems Inc. (ESi)

2:40 PM

Failure Analysis of Diesel-electric Locomotive Components: *Marcel Pitz*¹; ¹General Electric

3:00 PM

Investigation of a Train Derailment from a Fractured Wheel: *Erik Mueller*¹; ¹NTSB

3:20 PM Break

3:40 PM Invited

Passenger Ferry Loss of Propulsion: *David Shamrell*¹; ¹Engineering Design & Testing Corp.

4:00 PM Invited

Environmental Cracking in Aluminum Ship Material: *Benjamin Palmer*¹; John Lewandowski¹; ¹Case Western Reserve University

4:20 PM Invited

Mechanism of Crack Initiation and Propagation in a Stryker Light Armored Vehicle: *Sergei Shipilov*¹; ¹Corrosion Engineering Solutions Ltd.

4:40 PM Invited

Commercial Truck Cab Retention Failure and Crashworthiness in a Jack-knifing Event: *William Carden*¹; Eric Van Iderstine¹; ¹McSwain Engineering, Inc.

MS&T18 Plenary Session

Tuesday AM
October 16, 2018

Room: Union Station B
Location: Greater Columbus Convention Center

8:00 AM Introductory Comments

8:10 AM Plenary

ACeRS Edward Orton, Jr. Memorial Lecture: Regenerative Engineering: Materials in Convergence: *Cato Laurencin*¹; ¹University of Connecticut

TUESDAY AM

8:50 AM Award Presentation

8:55 AM Introductory Comments

9:00 AM Plenary

AIST Adolf Martens Memorial Steel Lecture: Steel – A Lot to Learn: *John Speer*¹; ¹Colorado School of Mines

9:40 AM Award Presentation

9:45 AM Introductory Comments

9:50 AM Plenary

ASM/TMS Joint Distinguished Lectureship in Materials and Society Award: The Ecosystem of Research, Education, and Community: *Lynette Madsen*¹; ¹National Science Foundation

10:30 AM Award Presentation

10th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Session III

Program Organizers: Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technology; Surojit Gupta, University of North Dakota; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin-Stout; Allen Applett, Oklahoma State University; Richard Sisson, Worcester Polytechnic Institute; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Mritunjay Singh, Ohio Aerospace Institute

Tuesday PM

October 16, 2018

Room: B233

Location: Greater Columbus Convention Center

Session Chairs: Yiquan Wu, Alfred University; Zhengyi Fu, Wuhan University of Technology

2:00 PM Invited

SiOC-based Energy Storage Materials: *Ralf Riedel*¹; Magdalena Graczyk-Zajac¹; Dragoljub Vrankovic¹; ¹T U Darmstadt

2:20 PM Invited

Porosity Control of Geopolymer Hydrogen Recombination Catalyst Support for Radioactive Waste Containers: *Hisayuki Suematsu*¹; Taro Utsumi¹; Isamu Kudo²; Tadachika Nakayama¹; Koichi Niihara¹; ¹Nagaoka University of Technology; ²ADVAN ENG Co. Ltd.

2:40 PM Invited

Polymer-derived Porous Mo₂C/Mo₅Si₃C/SiC Ceramic Nanocomposites for Hydrogen Evolution Reaction: *Zhaoju Yu*¹; ¹Xiamen University

3:00 PM Invited

Sintering Ceramics with Limited Grain Growth by Quasi-plastic Deformation as Dominating Mechanism: *Zhengyi Fu*¹; Weimin Wang¹; Hao Wang¹; ¹Wuhan University of Technology

3:20 PM

Synthesis of Intermetallic Silicide Powders by Microwave Assisted Combustion Reaction: *Rajalekshmi Pillai*¹; Sreekumar Chockalingam¹; Sam Baker¹; ¹SRS Holdings LLC

3:40 PM

Metallurgical History of Tellurium: *Kristian Mackowiak*¹; Lukas Bichler¹; ¹University of British Columbia - Okanagan Campus

4:00 PM

Strategies for Patenting “Green” Technologies: *Van Vekris*¹; ¹Sim & McBurney

4:20 PM

Successfully Patenting “Green” Materials and Processes: *Van Vekris*¹; ¹Sim & McBurney

ACerS Frontiers of Science and Society - Rustum Roy Lecture

Tuesday PM

October 16, 2018

Room: A111/112

Location: Greater Columbus Convention Center

Session Chair: L. David Pye, Alfred University

1:00 PM Invited

Imagination and Innovation in the Land of Machines: *David Morse*¹; ¹Corning Incorporated

Additive Manufacturing of Composites and Complex Materials III — Ceramic Additive Manufacturing

Program Organizers: Dirk Lehmuhs, Fraunhofer - Ifam; Jonathan Spowart, Air Force Research Laboratory; Nikhil Gupta, New York University; Eric Jaegle, Max-Planck-Institut Fuer Eisenforschung

Tuesday PM

October 16, 2018

Room: A222

Location: Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Introductory Comments

2:10 PM

Additive Manufacturing of Ceramic Materials for Aerospace Applications: *Matthew Dickerson*¹; Lisa Rueschhoff²; Luke Baldwin¹; Connor Wyckoff³; Michael Cinibulk¹; Hilmar Koerner¹; Matthew Dalton¹; ¹Air Force Research Laboratory

2:40 PM

Direct Writing LTCC Stacks Utilizing Ceramic On-Demand Extrusion: Wenbin Li¹; *Austin Martin*¹; Jeremy Watts¹; Ming Leu¹; Gregory Hilmas¹; Tieshu Huang²; ¹Missouri University of Science and Technology; ²NNSA's Kansas City National Security Campus

3:00 PM

Extrusion-based 3D Printing of Molecular Sieve Zeolite for Gas Absorption Applications: *Nishant Hawaldar*¹; Hye-Young Park²; Yeon-Gil Jung²; Jing Zhang¹; ¹Indiana University Purdue University Indianapolis; ²Changwon National University, Republic of Korea

3:20 PM

Optimizing Process Parameters to Binder Jet Ceramics: *Edgar Mendoza*¹; Daming Ding¹; Baby Reeya Jayan¹; Jack Beuth¹; ¹Carnegie Mellon University

3:40 PM

Preparation of Ceramic Core through 3D Printing Technology: *Hye-Young Park*¹; Hyun-Hee Choi¹; Bong-Gu Kim¹; Geun-Ho Cho¹; Eun-Hee Kim¹; Yeon-Gil Jung¹; Jing Zhang¹; ¹Changwon National University

4:00 PM

Optimization of Printing Parameters for 3D Printed PLA: *Nishant Hawaldar*¹; Piyush Raikar¹; *Tejesh Dube*¹; Jing Zhang¹; ¹IUPUI



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

Additive Manufacturing of Metals: Microstructure and Material Properties — Biomedical and Functional AM Materials

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

Tuesday PM
October 16, 2018

Room: A214
Location: Greater Columbus Convention Center

Session Chair: Timothy Horn, North Carolina State University

2:00 PM

Additive Manufacturing of Biocompatible Ti Alloy (Ti-Nb-Zr-Ta) for Implant Applications: *Maija Nystrom*¹; Juha Kotila¹; Eugene Ivanov²; Eduardo Del-Rio²; ¹EOS Finland; ²Tosoh SMD Inc.

2:20 PM

Additive Manufacturing: An Approach to Enhance Osteoblast Function and Resistance to Localized Corrosion for Biomedical Applications: Jahangir Khan Lodhi¹; *Waseem Haider*¹; Kashif Miraj Deen²; ¹Central Michigan University; ²University of British Columbia

2:40 PM

Electron Beam Melting Approaches for Titanium Alloy Octet Lattice Structure Fabrication: *Andrew Neils*¹; Abbas Moftakhar²; Liang Dong¹; Haydn Wadley¹; ¹University of Virginia Department of Materials Science; ²General Electric

3:00 PM

Tensile Properties and Processing Induced Variability in Laser Additive Manufactured Ti-6Al-4V Cellular Structure: *Husain Alnaser*¹; Anthony Sanders²; Ravi Chandran¹; ¹University of Utah; ²Ortho Development Corp.

3:20 PM

Study of the Ti53Nb Alloy Fabricated by Selective Laser Melting: *Jhoan Sebastian Guzmán Hernández*¹; Fernando Gomes Landgraf¹; Daniel Leal Bayerlein²; João Ferreira Neto²; Railson Bolsoni Falcão²; Edwin Sallica Leva²; Rafael Nobre¹; ¹University of Sao Paulo; ²IPT – Institute for Technological Research

3:40 PM

Direct Laser Deposition of Titanium-copper Binary Alloys: *Duyao Zhang*¹; Dong Qiu¹; Mark Easton¹; Mark Gibson²; David StJohn³; ¹MIT University; ²CSIRO; ³The University of Queensland

4:00 PM

Development of Nitinol Alloys for Additive Manufacturing: *Kerri Horvay*¹; Christopher Schade¹; Hoeganaes Specialty Metal Powders LLC.

4:20 PM

Advances in Metal Additive Manufacturing of Nanofunctionalized Materials: *Brennan Yahata*¹; Hunter Martin¹; Jacob Hundley¹; Julie Miller¹; Tobias Schaedler¹; Eric Clough¹; Randall Schubert¹; Mark Omasta¹; Hrl Laboratories, LLC

Additive Manufacturing of Metals: Microstructure and Material Properties — Characterization Methods for AM

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

Tuesday PM
October 16, 2018

Room: A215
Location: Greater Columbus Convention Center

Session Chair: Todd Palmer, The Pennsylvania State University

2:00 PM

Fundamental Characterization of Porosity in SLM by Micro-CT Scan: Subin Shrestha¹; Tom Starr¹; *Kevin Chou*¹; ¹University of Louisville

2:20 PM

Nanoindentation: A Suitable Tool in Metal Additive Manufacturing: *Carlos Botero*¹; Emilio Jiménez-Piqué²; Stefan Roos¹; Per Skoglund¹; Andrei Koptuyg¹; Lars-Erik Rännar¹; Mikael Bäckström¹; ¹SportsTech Research Centre, Mid Sweden University; ²Barcelona Research Center in Multiscale Science and Engineering, Universitat Politècnica de Catalunya

2:40 PM

Validation of Methods for Mechanical and Microstructural Property Measurement of Sub-standard Sized SLM Test Specimens: *Tanni Alam*¹; Jonathan Raush¹; Congyuan Zeng²; Shengmin Guo¹; ¹University of Louisiana at Lafayette; ²Louisiana State University

3:00 PM

Texture Analysis of Additively Manufactured Ti-6Al-4V Using Neutron Diffraction: *Gennadi Rafailov*¹; Asaf Pesach¹; Eitan Tiferet¹; Sven C. Vogel¹; Elad N Caspi¹; LANL

3:20 PM

Microstructural Characterization of Alternative Manufacturing Techniques of U6Nb: Additive Manufactured, Cast and Wrought: *Eloisa Zepeda-Alarcon*¹; Donald Brown¹; Bjorn Clausen¹; Amanda Wu²; ¹Los Alamos National Laboratory; ²Lawrence Livermore National Laboratory

3:40 PM

Manipulation of Mechanical Properties of WAAM Deposited Material through Active Cooling: *Andre Corpus*¹; Michael Maughan¹; ¹University of Idaho

4:00 PM

Feasibility of Repairing Parts Using Electron Beam Melting: Per Skoglund¹; Carlos Botero¹; Andrei Koptuyg¹; *Lars-Erik Rännar*¹; Mikael Bäckström¹; ¹SportsTech Research Centre, Mid Sweden University

4:20 PM

Near Net-shape, Additively Manufactured Metal Parts with Stress-free Isotropic Microstructures via Sintering: *Shashank Holenarasipura Raghul*¹; Michael Gibson¹; Nihan Tuncer¹; Brian Kernan¹; Anna Trumpf¹; Jesse Cataldo¹; Ellen Benn¹; Shannon Taylor¹; Alexander Barbati¹; Animesh Bose¹; Lisa Maiocco¹; ¹Desktop Metal

TUESDAY PM

Additive Manufacturing of Metals: Post Processing — Heat Treatment I

Program Organizers: Ola Harrysson, North Carolina State University; Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; S. Babu, Indian Institute of Technology Madras

Tuesday PM Room: A216
October 16, 2018 Location: Greater Columbus Convention Center

Session Chair: Ola Harrysson, NC State University

2:00 PM Invited

To Post-process Or Not to Post-process: *Moataz Attallah¹; Uriel Tradowsky¹; Luke Carter¹; Ji Zou¹; Sheng Li¹; Chunlei Qiu¹; ¹University of Birmingham*

2:40 PM

Microstructure and Properties of Additive Laser Powder Bed Fusion Processed and Heat-treated Co-Cr-Mo Alloy: *Boateng Twum Donkor¹; Vijay Vasudevan¹; Seetha Mannava¹; Michael Kattoura¹; ¹University of Cincinnati*

3:00 PM

Parametric Investigation of Selective Laser Melting and Post-Heat Treatment for Al10SiMg Alloys: *Holden Hyer¹; Sharon Park¹; Le Zhou¹; Bjorn Tolentino¹; Edward Dein¹; Brandon McWilliams²; Kyu Cho²; Yongho Sohn¹; ¹University of Central Florida; ²U.S. Army Research Laboratory*

3:20 PM

Impact of Hot Isostatic Pressing (HIP) on the Mechanical Behavior of Additively Manufactured Ti-6Al-4V by Directed Energy Deposition: *Jayne Keist¹; Todd Palmer¹; ¹Penn State*

3:40 PM

Selective Laser Melting of Ti6-Al-4V with High Build Rates and Following Hot Isostatic Pressing: *Dominik Ahlers¹; Florian Hengsbach¹; Madison Burns¹; Peter Koppa¹; Thomas Tröster¹; Mirko Schaper¹; ¹Paderborn University*

4:00 PM

Effects of Post-build Thermal Processing on the Microstructure of Laser Powder-bed Produced 17-4 PH Stainless Steel: *Eric Lass¹; Carelyn Campbell¹; Maureen Williams¹; ¹NIST*

Additive Manufacturing: In-situ Process Monitoring and Control — Session III

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

Tuesday PM Room: A221
October 16, 2018 Location: Greater Columbus Convention Center

Session Chair: Sudarsanam Babu, University of Tennessee, Knoxville

2:00 PM

Overview of In-situ Quality Assurance: Why Is It Needed and Which Tools Can Be Used?: *Robin Day¹; ¹RWTH Aachen University Digital Additive Production*

2:20 PM

The Potential of Backscatter Electron Imaging in Selective Electron Beam Melting for Quality Management: *Fuad Osmanlic¹; ¹Friedrich-Alexander-Universität Erlangen-Nürnberg*

2:40 PM

Application of Data Sciences Tools to Qualify Additive Manufacturing Processes – Evaluation of Electron Beam – Powder Bed Fusion Process with Unused and Recycled Powders of Ni- and Ti-alloys: *Sujana Chandrasekar¹; Jamie Coble¹; Sudarsanam Babu¹; Vincent Paquit²; Peeyush Nandwana²; Sean Yoder²; Ryan Dehoff²; ¹The University of Tennessee, Knoxville; ²Oak Ridge National Laboratory*

3:00 PM

New Electron Beam Powder Bed Fusion System with Open Source Software, Tailored for Materials Research and Development: *Ulf Ackelid¹; Patrik Ohldin¹; Robin Stephansen¹; Martin Wildheim¹; Fredrik Ostman¹; Ulric Ljungblad¹; ¹Freemelt AB*

3:20 PM

Design of Flexible Multilayer Powder Feed System for In-situ X-ray Studies: *Somashekara M Adinarayanappa¹; Ryan Ott¹; Matt Kramer¹; Peter Collins²; ¹Ames Laboratory; ²Iowa State University*

3:40 PM

Autonomous L-PBF Powder Bed Anomaly Classification Using a Multi-scale Convolutional Neural Network: *Luke Scime¹; Jack Beuth¹; ¹Carnegie Mellon University*

4:00 PM

Instant Monitoring and Controlling of the Thermal Conditions in Additive Manufacturing: *Stephan Ulassin¹; Jonathan Holman¹; Serdar Tunkor¹; ¹University of Pittsburgh*

Additive Manufacturing: Modeling and Simulation of AM Materials, Processes, and Mechanics — AM Modeling - Session III

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

Tuesday PM Room: A223
October 16, 2018 Location: Greater Columbus Convention Center

Session Chairs: Jing Zhang, Indiana University - Purdue University Indianapolis; Xinghua Yu, Oak Ridge National Laboratory

2:00 PM

Simulation Assisted Design for Additive Manufacturing: *Lukas Masseling¹; Ulrich Thombansen¹; Kevin Brigden²; Pam Whitaker²; Javier Gutierrez³; Mustafa Megahed⁴; ¹Fraunhofer ILT; ²Renishaw; ³ITP Aero; ⁴Esi Group*

2:20 PM

Temperature-dependent Charpy Impact Property of 3D Printed 15-5 Stainless Steel: *Sugrim Sagar¹; Yi Zhang¹; Yeon-Gil Jung²; Jing Zhang¹; Hye-Young Park²; ¹Indiana University-Purdue University Indianapolis; ²Changwon National University*

2:40 PM

A Microstructural Modelling Approach for Ni Superalloys Built by Additive Manufacturing: *Guilherme Faria¹; Kamal Kadirvel¹; Wei Zhang¹; Yunzhi Wang¹; Antonio Ramirez¹; ¹Dept. of Materials Science and Eng. - The Ohio State University*

3:00 PM

Phase Field Modeling of Dendritic Formation in Additively Manufactured Ti-6Al-4V: *Linmin Wu¹; Lingbin Meng¹; Jing Zhang¹; ¹IUPUI*



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COLUMBUS, OHIO, USA

3:20 PM

Materials-genome-based Numerical Investigation of Microstructure Evolution and Cracking during Ceramic Additive Manufacturing: *Xiangyang Dong*¹; ¹Missouri University of Science and Technology

3:40 PM

Design and Construction of 3D Printed Parts by Using Composite Laminate Theory: *Jordan Garcia*¹; Y. Charles Lu¹; ¹University of Kentucky

4:00 PM

Microstructure Prediction in Additively Manufactured Inconel 718: *Joe Pauza*¹; Runbo Jiang¹; Lonnie Smith¹; Christopher Pistorius¹; Anthony Rollett¹; ¹Carnegie Mellon University

4:20 PM

Analysis of Fatigue Behavior of 3d Printed 15-5 Stainless Steel: A Combined Modelling and Experimental Study: *Anudeep Padmanabhan*¹; Jing Zhang¹; ¹Indiana University - Purdue University Indianapolis

Additive Manufacturing: Powder Characterization and Recycling — Recyclability of Powders and Characterization

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

Tuesday PM
October 16, 2018

Room: A224
Location: Greater Columbus Convention Center

Session Chair: Sudarsanam Babu, University of Tennessee, Knoxville

2:00 PM Invited

Changes in Surface Chemistry of Metal Powders during Powder Bed Fusion Processing: *Eduard Hryha*¹; ¹Chalmers University of Technology

2:40 PM

Characterization of Spatter Particles Produced by PBF: *Christopher Rock*¹; Tim Horn¹; Rashmi Vadlakonda¹; ¹North Carolina State University

3:20 PM

Interstitial Gain Modeling for Effective Powder Recyclability in Selective Laser Melting(SLM) Additive Manufacturing(AM) for Ti6Al4V Alloy: *Aniruddha Das*¹; Mathieu Brochu¹; ¹McGill University

3:40 PM

Recyclability of Metal Powder Feedstock in Additive Manufacturing: Characterization of 316L Stainless Steel: *Michael Heiden*¹; Josh Koepke¹; David Saiz¹; Chris DiAntonio¹; Lisa Deibler¹; Daniel Tung¹; Jeffrey Rodelas¹; Bradley Jared¹; ¹Sandia National Labs

Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder — Session III

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

Tuesday PM
October 16, 2018

Room: B230
Location: Greater Columbus Convention Center

Session Chairs: Carol Handwerker, Purdue University; Eric Chason, Brown University

2:00 PM Invited

Comparisons between Orientation Measurements in Solder Joints and Solder Bumps Using High Energy X-ray Diffraction and Electron Backscattered Diffraction Mapping: Quan Zhou¹; Justin Roe¹; *Thomas Bieler*¹; Tae-Kyu Lee²; ¹Michigan State University; ²Portland State University

2:20 PM

Microstructural Evolution due to Thermal Cycling Leadless Chip Carriers: *Alyssa Yaeger*¹; Carol Handwerker¹; John Blendell¹; Ganesh Subbarayan¹; Travis Dale¹; Elizabeth McClamrock¹; ¹Purdue University

2:40 PM

Solid State Interfacial Reactions at Pb-free Solder / Surface Finish Interface: *Faramarz Hadian*¹; Harry Schoeller²; Eric Cotts¹; ¹Binghamton University; ²Universal Instruments Corporation

3:00 PM Invited

What Makes Sn Whiskers Nucleate and Grow: Insight from Real-time Measurements and Modeling: *Eric Chason*¹; Nupur Jain¹; Andrew Hitt¹; Fei Pei²; ¹Brown University; ²Amphenol-tcs

3:20 PM

Formation and Evolution of Tin Surface Defects Using Cyclic Thermal and Mechanical Loading: *Xi Chen*¹; Carol Handwerker¹; John Blendell¹; ¹Purdue University

3:40 PM

Dislocations Resulted Recrystallization in Tin Whiskers Formation during Thermal Cycling: *Congying Wang*¹; Carol Handwerker¹; John Blendell¹; ¹Purdue University

4:00 PM

Simulation of Microstructural Evolution and Whisker Growth in Thin Films: *Xiaorong Cai*¹; Marisol Koslowski¹; ¹Purdue University

TUESDAY PM

Advanced Steel Metallurgy: Products and Processing — Iron and Steelmaking, Processing, and Cleanliness

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

Tuesday PM
October 16, 2018

Room: A226
Location: Greater Columbus Convention Center

Session Chairs: Ashish Singh, Welspun Tubular LLC; Shobhit Bhartiya, Big River Steel LLC

2:00 PM

Numerical Simulation of Fluid Flow during the Steel Refining Process in an Electric Arc Furnace: Yuchao Chen¹; Armin Silaen¹; *Chenn Zhou*¹; ¹Purdue University Northwest

2:30 PM

Formation and Evolution of Inclusions in GCR15 Bearing Steels: Gong Cheng¹; Jiaheng Duan¹; Wenbo Wang¹; *Lifeng Zhang*¹; ¹University of Science and Technology Beijing

2:50 PM

Complex Precipitation of MnS and Oxides in Heavy Rail Steels: *Wen Yang*¹; Xuewei Zhang¹; Yanping Chu¹; Lifeng Zhang¹; Gong Cheng¹; ¹University of Science and Technology Beijing

3:10 PM

Application of Ultrasonic Non-destructive Testing System and ANSYS Simulation to Assess Defects in Continuously Cast Steel Slabs: Zhanfang Wu¹; *Hsiang Ling Juan*¹; C. Isaac Garcia¹; ¹University of Pittsburgh

3:30 PM

Control of the Slab Corner Precipitation Behavior for Micro-alloyed Steels Continuous Casting: *Zhaozhen Cai*¹; Miao-yong Zhu¹; ¹Northeastern University

3:50 PM

The Influence of SEN and Upnozzle Design on the Flow Character for the Slab Quality: *Yu Yanwen*¹; ¹Baoshan Iron Steel Co. Ltd.

4:10 PM

Improvement in Refractory Life of Smelting Reduction Furnace: *Koichi Takahashi*¹; Daisuke Kondo¹; Sohei Takagaki¹; Keisuke Adachi¹; Masanori Nishikori¹; ¹JFE Steel Corporation

Advances in Dielectric Materials and Electronic Devices — Advanced Dielectrics and Energy

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

Tuesday PM
October 16, 2018

Room: B132
Location: Greater Columbus Convention Center

Session Chair: Steven Tidrow, Alfred University

2:00 PM Invited

Factors Affecting the Electrocaloric Cooling Performance of Ferroelectric Perovskites: Florian Weyland¹; Nikola Novak¹; *George Rossetti*²; ¹Technical University of Darmstadt; ²University of Connecticut

2:20 PM

Processing of 2-D Ceramic Nanofillers/PVDF Dielectric Nanocomposites for Enhanced Energy Storage Capability: *Dokyun Kwon*¹; Yumin Goh¹; Hyunseung Cho¹; Hyunjeong Bae¹; Hoisub Shin¹; ¹Korea Aerospace University

2:40 PM Invited

Features of the PbTiO₃-CaTiO₃ Morphotropic Phase Boundary: *Ducinei Garcia*¹; Flávia Estrada¹; ¹Federal University of Sao Carlos

3:00 PM

Antiferroelectric Materials as Dielectric Coolants: Theory and Experiments: Bouchra Asbani¹; Brigita Rozic²; Hana Ursic²; Mimoun El Marssi¹; Rasa Pirc²; Jurij Koruza³; Barbara Malic²; *Zdravko Kutnjak*²; ¹University of Picardie Jules Verne; ²Jozef Stefan Institute; ³Technische Universitaet Darmstadt

3:20 PM

Capacitors as Thermal-to-Electric Energy Conversion Devices: Steven Tidrow¹; *Jessica Scoones*¹; Dustin Travis¹; Soutik Betal¹; Steven Pilgrim¹; Walter Schulze¹; ¹Alfred University

3:40 PM

Pyrolytic Graphite-copper Thermocouple for Non-invasive Direct Temperature Measurement: *Abdul-Sommed Hadi*¹; Jonathan Lann²; Tyler Fricks²; Bryce Hill²; ¹Montana Tech of the University of Montana; ²Montana Technological University

4:00 PM Invited

Electric Field Control of Interfacial Magnetism through Ionic Liquid Gating: *Zhongqiang Hu*¹; Ziyao Zhou¹; Ming Liu¹; ¹Xi'an Jiaotong University

4:20 PM

Effect of Calcination and Sintering Temperature on Dielectric Properties of Giant Dielectric Ti<0.9>(Al<0.5>Nb<0.5>)<0.1>O<2> Ceramics: *Ranabrata Mazumder*¹; Subhra Sourav Jana¹; Sumit Choudhary¹; S. Abhinay¹; ¹National Institute of Technology Rourkela

Advances in Solid Oxide Fuel Cell Technology — SOFCs for Stationary Applications

Program Organizers: Scott Swartz, Nexceris LLC; Matthew Seabaugh, Nexceris LLC; Jeff Stevenson, Pacific Northwest National Laboratory

Tuesday PM
October 16, 2018

Room: D281
Location: Greater Columbus Convention Center

Session Chairs: Jeff Stevenson, Pacific Northwest National Laboratory; Patcharin Burke, Department of Energy

2:00 PM Invited

Solid Oxide Fuel Cell Stack Technology: Status and Challenges: *Nguyen Minh*¹; ¹University of California, San Diego

2:20 PM Invited

Overview of DOE Office of Fossil Energy's Solid Oxide Fuel Cell Program: *Patcharin Burke*¹; Shailesh Vora¹; ¹Department of Energy, National Energy Technology Laboratory

2:40 PM Invited

Innovative Natural-gas Technologies for Efficiency Gain in Reliable and Affordable Thermochemical Electricity-generation (Integrate): *David Tew*¹; ¹ARPA-E

3:00 PM Invited

Functional Interfacial Layers to Reduce Detrimental Cell Interactions: *Neil Kidner*¹; Steve Bradshaw¹; Kari Riggs¹; David Kopechek¹; Gene Arkenberg¹; Matthew Seabaugh¹; Scott Swartz¹; ¹Nexceris LLC



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3:20 PM Invited

Combining Experiments, Modeling, and Systems Analysis to Enable Solid Oxide Fuel Cell Technology: *Harry Abernathy*¹; Gregory Hackett¹; Shiwoo Lee¹; Thomas Kalapos¹; ¹National Energy Technology Laboratory

3:40 PM

Supircat™: A High Performing Internal Reforming Catalyst Technology for SOFC Applications: *Naftali Opembe*¹; Matthew Seabaugh¹; Scott Swartz¹; Douglas Mitchell¹; Sergio Ibanez¹; ¹Nexceris LLC

4:00 PM

Nano-CeO₂ Catalyst Deposition Using Bio-adhesive Catechol Surfactants for Efficient Enhancement of SOFC Electrodes: *Ozcan Ozmen*¹; John Zondlo¹; Edward Sabolsky¹; Shiwoo Lee²; Gregory Hackett²; Harry Abernathy²; Neil Kidner³; Matthew Seabaugh³; ¹West Virginia University; ²US DOE-National Energy Technology Laboratory; ³Nexceris, LLC

4:20 PM

Quantitative Analysis of Multi-scale Microstructural Heterogeneities in SOFC Electrodes: *Rubayyat Mahbub*¹; Mingzhen Feng¹; Tim Hsu¹; William Epting²; Ross Cunningham¹; Gregory A Hackett²; Harry Abernathy²; Anthony D Rollett¹; Shawn Litster¹; Peter Kenesei³; David B Menasche¹; Robert Suter¹; Paul A Salvador¹; ¹Carnegie Mellon University; ²U.S. DOE National Energy Technology Laboratory; ³Argonne National Laboratory

ASM Edward DeMille Campbell Memorial Lecture

Tuesday PM
 October 16, 2018

Room: C170
 Location: Greater Columbus Convention Center

12:45 PM Invited

Sustainable Materials Development: A Case Study Approach: *Julie Schoenung*¹; ¹University of California, Irvine

Boron, Boron Coatings, Boron Compounds and Boron Nanomaterials: Structure, Properties, Processing, and Applications — Physical Properties of Bulk Systems

Program Organizers: Jens Kunstmann, Technische Universität Dresden; Roumiana Petrova, New Jersey Institute of Technology; Scott Beckman, Washington State University

Tuesday PM
 October 16, 2018

Room: B244/245
 Location: Greater Columbus Convention Center

Session Chair: Jens Kunstmann, TU Dresden

2:00 PM Invited

Chemical Space Partitioning in New Intermetallic Borides MNi₂₁B₂₀ (M = In, Sn): *Andreas Leithe-Jasper*¹; Frank Wagner¹; Qiang Zheng¹; Juri Grin¹; ¹MPI-CPfS

2:40 PM Invited

Thermoelectric Properties of Boron-rich Metal Borides: *Masatoshi Takeda*¹; ¹Nagaoka University of Technology

3:20 PM Question and Answer Period

3:40 PM Invited

Temperature-dependent Site Occupation in Elemental Beta Boron: *Michael Widom*¹; ¹Carnegie Mellon University

4:20 PM Invited

Insights on Hydrogenated Alpha-tetragonal Boron and the Phase Diagram of Two-dimensional Boron Oxide: *Jens Kunstmann*¹; ¹Tu Dresden

Careers in Industry — Networking and Careers for Material Scientists

Program Organizers: Kathleen Shugart Cissel, UES Inc; Krista Grayson, Mo-Sci Corporation

Tuesday PM
 October 16, 2018

Room: B231
 Location: Greater Columbus Convention Center

Session Chairs: Amanda Krause, Lehigh; Kathleen Cissel, UES, Inc

2:00 PM Invited

Networking: *Kristen Brosnan*¹; ¹GE Global Research

2:40 PM Invited

How Advanced Degrees in MSE Enable Business Opportunities: *Robert Wheeler*¹; ¹Microtesting Solutions LLC

3:00 PM Invited

Developing Your Career at a National Laboratory: *Marissa Reigel*¹; ¹Savannah River National Lab

3:40 PM Invited

What R&D Means in a Small Company: *Steven Jung*¹; ¹Mo-Sci Corporation

4:00 PM Invited

So What Next? Careers at Large Companies for Graduates with Materials Science Backgrounds: *Adam Stevenson*¹; ¹Saint-Gobain

4:40 PM Invited

Airplane Material Advancements to Meet Future Industry Demand: *Daniel Sievers*¹; ¹Boeing

Ceramic and Crystal Materials for Optics and Photonics — Session III

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Michael Squillante, RMD, Inc; Akio Ikesue, World-Lab. Co., Ltd; Mark Dubinskiy, Army Research Laboratory

Tuesday PM
 October 16, 2018

Room: A113
 Location: Greater Columbus Convention Center

Session Chairs: Do-Kyung Kim, Korea Advanced Institute of Science & Tech; Victoria Blair, Army Research Laboratory

2:00 PM Invited

The Elusiveness of Tough, Transparent Ceramics: *Ivar Reimanis*¹; ¹Colorado School of Mines

2:20 PM Invited

Testing and Design of Nd:YVO₄ Laser Amplifier Components for the ICESat-2 Altimeter: *Jonathan Salem*¹; Nicholas Sawruk²; Eric Baker¹; ¹NASA Glenn Research Center; ²Fibertek

3:00 PM

Updated Advances in Coherent Poly-propagation of Diffracted White Light in Natural Silicates: *Michelle Stem*¹; ¹Complete Consulting Services LLC

TUESDAY PM

3:20 PM Invited

Transparent Ceramics for Laser and Optical Applications: *Long Zhang*¹; Benxue Jiang¹; Xiaojian Mao¹; Qiangqiang Zhu¹; ¹Shanghai Institute of Optical and Fine Mechanics, Chinese Academy of Science

Characterization & Methods in Failure Analysis — Fatigue & Fracture I

Program Organizers: Andrew Havics, PH2 LLC; Burak Akycz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

Tuesday PM Room: A211
October 16, 2018 Location: Greater Columbus Convention Center

Session Chairs: Guiru Liu, Progress Rail; Nicholas Cherolis, Baker Risk; Wesley Pridemore, General Electric-Aviation; Pierre Dupont, Schaeffler Belgium Sprl/bvba; Conrad Park, Case Western Reserve University

2:00 PM Invited

William FAIRBAIN Was Not at All Tired by Fatigue Aid August WÖHLER!
*Pierre Dupont*¹; ¹Schaeffler Belgium Sprl/Bvba

2:40 PM

The Unusual Case of Pressure Bottles Bursting Open after Decades of Service:
*Donato Firrao*¹; Luca Marmo¹; Paolo Matteis¹; ¹Politecnico Di Torino

3:00 PM Invited

Advanced Mill Roll Life Cycle Management: *Konstantin Redkin*¹; Christopher Hrizo¹; Kevin Marsden¹; ¹WHEMCO Inc

Composition-Processing-Microstructure-Property Relationships of Titanium Alloys — Phase Transitions & Alloy Design

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

Tuesday PM Room: C150
October 16, 2018 Location: Greater Columbus Convention Center

Session Chairs: Benjamin Morrow, Los Alamos National Laboratory; Yufeng Zheng, The Ohio State University

2:00 PM Invited

The Dynamic Behavior of Titanium: Capturing Phase Transitions under Extreme Loading: *David Jones*¹; Benjamin Morrow¹; Ellen Cerreta¹; Paulo Rigg²; ¹Los Alamos National Lab; ²Dynamic Compression Sector, Washington State University

2:30 PM

Investigation of α Phase Formation in Metastable β Ti Alloys: *Petr Hrcuba*¹; Jana Smilauerova¹; Václav Holy¹; ¹Charles University in Prague

2:50 PM

Study of the Transition Region between ω and β Phases in Ti-15Mo by X-ray Diffraction: *Jana Šmilauerová*¹; Petr Hrcuba¹; Jozef Veselý¹; Miloš Janeček¹; Václav Holý¹; ¹Charles University

3:10 PM Invited

Stability of Two Phase (alpha/omega) Microstructure in Shocked Titanium: *Reeju Pokharel*¹; Benjamin Morrow¹; Adrian Losko¹; Donald Brown¹; Jun-Sang Park²; ¹Los Alamos National Lab; ²Argonne National Lab

3:40 PM Invited

The Role of Non-conventional Transformation Pathways and Structural Instabilities on the Microstructural Evolution in Metastable Beta-titanium Alloys: Yufeng Zheng¹; Yunzhi Wang¹; Rajarshi Banerjee²; Dipankar Banerjee³; *Hamish Fraser*¹; ¹Ohio State University; ²University of North Texas; ³Indian Institute of Science

4:10 PM Invited

Tuning the Scale of a Precipitates in β -titanium Alloys for Achieving High Strength: Srinivas Aditya Mantri¹; Deep Choudhuri¹; Talukder Alam¹; *Rajarshi Banerjee*¹; ¹University of North Texas

4:40 PM

Microstructure Design by Two Step Phase Transformation in β Ti-alloys: *Dong Wang*¹; Tianlong Zhang¹; Yunzhi Wang²; ¹Xi'an Jiaotong University; ²The Ohio State University

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Session II

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

Tuesday PM Room: D180
October 16, 2018 Location: Greater Columbus Convention Center

Funding Support provided by: MilliporeSigma

Session Chairs: Kathy Lu, Virginia Tech; Haitao Zhang, University of North Carolina at Charlotte

2:00 PM Keynote

Wafer Scale Two-dimensional Transition Metal Dichalcogenide Materials and Devices: *Linyou Cao*¹; ¹North Carolina State University

2:40 PM

Study of Low-temperature Photocatalytic Protonation of 2D MoO₃ Nanoflakes with Pure Alcohol: Soheil Razmyar¹; *Haitao Zhang*¹; ¹UNC Charlotte

3:00 PM

Permelective H₂/CO₂ Separation and Desalination of Hybrid GO/rGO Membranes with Controlled Pre-crosslinking: *Han Lin*¹; Ruo Chen Liu²; Shailesh Dangwal²; Seok-Jhin Kim²; Nitin Mehra¹; Yifan Li¹; Jiahua Zhu¹; ¹The University of Akron; ²Oklahoma State University

3:20 PM Keynote

Complexity of Intercalation In-between 2D Transition Metal Carbides “MXenes” and Their Applications as Energy Storage Materials: *Michael Naguib*¹; ¹Tulane University



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Deformation and Transitions at Grain Boundaries VI — Grain Boundary Energy and Structure I

Program Organizers: Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Saryu Fensin, Los Alamos National Laboratory; Jian Luo, University of California San Diego; Douglas Spearot, University of Florida

Tuesday PM
 October 16, 2018
 Room: A123
 Location: Greater Columbus Convention Center

Session Chairs: Shengfeng Yang, Indiana University Purdue University Indianapolis; Timothy Rupert, University of California Irvine

2:00 PM Invited

Charting the Chemical Landscape of Grain Boundaries: An Atomistic Method to Determine Ground-state Complexions.: Peter Larsen¹; Arvind Kalidindi¹; Christopher Schuh¹; ¹MIT

2:30 PM Invited

Decorating Defects with Segregating Dopants to Tailor Mechanical Properties.: Timothy Rupert¹; ¹University of California Irvine

3:00 PM Invited

Modeling Grain Boundary Phases Transitions with Atomistic Simulations: Shengfeng Yang¹; Jian Luo²; ¹Indiana University Purdue University Indianapolis; ²University of California, San Diego

3:30 PM Invited

Grain Boundary Energy and Velocity Shift during Grain Growth of Nanocrystalline Magnesium Aluminate: Ricardo Castro¹; Dereck Muehe¹; ¹University of California, Davis

4:00 PM

Mechanical Properties of Nanocrystalline-nanotwinned Silver Strengthened by Copper Impurity Segregation: Xing Ke¹; Frederic Sansoz¹; Y. Morris Wang²; Ryan Ott³; Jaime Marian⁴; ¹The University of Vermont; ²Lawrence Livermore National Laboratory; ³Ames Laboratory; ⁴University of California Los Angeles

4:20 PM

Role of Grain Boundaries on Damage Evolution in Wrought and Additively Manufactured (AM) Tantalum: George Gray¹; Veronica Livescu¹; Thomas Nizolek¹; Carl Trujillo¹; Roberta Beal¹; David Jones¹; ¹Los Alamos National Lab

Environmental Degradation and Embrittlement of Structural Metals — Hydrogen Embrittlement I

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

Tuesday PM
 October 16, 2018
 Room: C162A/162B
 Location: Greater Columbus Convention Center

Session Chair: Jun Song, McGill University

2:00 PM Invited

Relating the Crystallographic Character of Individual Grain Boundaries to Their Hydrogen Embrittlement Susceptibility: Michael Demkowicz¹; ¹Texas A&M University

2:30 PM

A Novel Experimental-numerical Approach to Investigate Hydrogen Enhanced Localized Plasticity (HELP) Mechanism: Seyedeh Mohadeseh Taheri Mousavi¹; Benjamin Cameron¹; Motomichi Koyama²; C. Cem Tasan¹; ¹MIT; ²Kyushu University

2:50 PM

Hydrogen Effects on the Evolution of Plastic Deformation and Intergranular Failure of Ni: A Study across Length Scales: Kaila Bertsch¹; Shuai Wang²; Akihide Nagao³; Ian Robertson²; ¹University of Illinois at Urbana-Champaign; ²University of Wisconsin-Madison; ³International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Kyushu University

3:10 PM Invited

Hydrogen-microvoid Interactions in Metals: Zhiliang Zhang¹; ¹Norwegian University of Science and Technology

3:30 PM

Hydrogen Trapping and Kinetics at Phase Boundaries in High-strength Steels: An Atomistic Study: Xiao Zhou¹; Xiaohan Bie¹; Jun Song¹; ¹McGill University

3:50 PM

Hydrogen Embrittlement of 4340 Steel with Martensitic and Bainitic Microstructures for Fastener Applications: Dane Hyer-Peterson¹; Kip Findley¹; ¹Colorado School of Mines

Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology — ACerS GOMD Alfred R. Cooper Award Session

Program Organizers: John Kieffer, University of Michigan; Liping Huang, Rensselaer Polytechnic Institute

Tuesday PM
 October 16, 2018
 Room: A115
 Location: Greater Columbus Convention Center

Session Chair: Neville Greaves, University of Cambridge

2:00 PM Introductory Comments

2:10 PM Invited

A Multiscale Approach to the Mechanical Properties of Glass: Tanguy Rouxel¹; ¹University of Rennes 1

2:50 PM Invited

Structural Relaxation versus Crystallization in a Deeply Undercooled Glass: Ricardo Felipe Lancelotti¹; Daniel Roberto Cassar¹; Edgar Zanotto¹; ¹Federal University of Sao Carlos

3:30 PM Invited

Alfred R. Cooper: The Melody Lingers On: John Mauro¹; ¹The Pennsylvania State University

4:10 PM Invited

Effects of B2O3/SiO2 Substitution on Structure and In Vitro Bioactivity of Phosphosilicate Bioactive Glasses: Jincheng Du¹; Xiaonan Lu¹; Mengguo Ren¹; ¹University of North Texas

4:50 PM Invited

Therapeutic Bioactive Glass Nanoparticles and the Challenge of Ion Incorporation: Julian Jones¹; ¹Imperial College

TUESDAY PM

IMS Symposium on Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties — Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties II

Program Organizers: Daniel Dennies, DMS, Inc.; James Martinez, NASA Johnson Space Center; Michael Keeble, Buehler, A Division of ITW; Jaret Frafjord, IMR Test Labs - Portland

Tuesday PM
October 16, 2018

Room: A212
Location: Greater Columbus Convention Center

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

2:00 PM Invited

ASM-IMS Henry Clifton Sorby Lecture: Summary of Analysis of Human and Methodological Factors Affecting the Accuracy and Precision of Quantitative Descriptions of the Microstructure of Materials: *Agnieszka Szczotok*¹; Jan Cwajna¹; ¹Silesian University of Technology, Faculty of Materials Engineering and Metallurgy

3:00 PM Invited

Macrocharacterization and Mapping of Creep Damage in Semi-circular Notched Bar Creep Tests: *John Siefert*¹; Tapasvi Lolla¹; ¹Electric Power Research Institute

3:20 PM

Martempering and the Fracture Toughness of a Medium Carbon Secondary Hardening Steel: *Warren Garrison*¹; Yu Lin¹; Yaxu Zheng²; ¹Carnegie Mellon University; ²University of Science and Technology Beijing

3:40 PM

The Study of the Embrittlement of a Medium Carbon Secondary Hardening Steel on Cooling from the Austenitizing Temperature: *Yu Lin*¹; Yaxu Zheng²; Warren Garrison¹; ¹Carnegie Mellon University; ²University of Science and Technology Beijing

4:00 PM

The Effect of Long-period Stacking-ordered Structure (LPSO) on Deformation Behavior of Magnesium Rare Earth Alloys: *Kun Li*¹; R.D.K. Misra²; ¹University of Texas El Paso; ²UTEP

4:20 PM

Experimental Investigation and Computational Modeling of the Multiaxial Plasticity Behavior of DP600 at Macro and Microscales: *Shipin Qin*¹; Ross McLendon²; Victor Oancea²; Allison Beese¹; ¹Department of Materials Science and Engineering, Pennsylvania State University; ²Dassault Systemes SIMULIA Corp.

Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches — Surface Properties

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

Tuesday PM
October 16, 2018

Room: A122
Location: Greater Columbus Convention Center

Session Chair: Wolfgang Rheinheimer, Purdue University

2:00 PM Invited

Development of Electronic Materials Using Combinatorial Substrate Epitaxy: Elizabeth Mao¹; Julia Wittkamper¹; Haobo Li¹; Catherine Zhou¹; Wilfrid Prellier²; Gregory Rohrer¹; *Paul Salvador*¹; ¹Carnegie Mellon University; ²Laboratoire CRISMAT, CNRS UMR 6508, ENSICAEN, Normandie Université

2:30 PM

Role of Hydrogen-bond Reorientation and Second Shell Waters and Surfaces on Proton Transport: Jesse Lentz¹; *Stephen Garofalini*¹; ¹Rutgers University

3:00 PM

On the Kinetics of Si Grain Boundary Segregation in an Iridium Alloy during Continuous Cooling: *Dean Pierce*¹; Govindarajan Muralidharan¹; Lee Heatherly¹; Cecil Carmichael¹; George Ulrich¹; ¹Oak Ridge National Laboratory

3:20 PM

Adsorption and Diffusion of Oxygen on Pure and Partially Oxidized Al and Ni Surfaces: *Krishan Kanhaiya*¹; Hendrik Heinz¹; ¹University of Colorado Boulder

3:40 PM

Influence of Polarization Magnitude on the Photochemical Reactivity of BaTiO₃: *Wenja Song*¹; Paul Salvador¹; Gregory Rohrer¹; ¹Carnegie Mellon University

4:00 PM

Atomistic Methods for Prediction of Static Friction: *William Joost*¹; Kelly Harrington¹; Pantcho Stoyanov¹; ¹Pratt & Whitney

International Symposium on Ceramic Matrix Composites — Damage Evaluation and Modeling

Program Organizers: Jitendra Singh, Retired, U.S. Army Research Laboratory; Narottam Bansal, National Aeronautics and Space Administration; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

Tuesday PM
October 16, 2018

Room: A114
Location: Greater Columbus Convention Center

Session Chair: Triplicane Parthasarathy, UES, Inc.

2:00 PM Invited

Role of Extreme Values in Constituent Geometry and Property Distributions in Design of SiC/SiC CMCs: *Frank Zok*¹; ¹University of California Santa Barbara



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2:40 PM Invited

Modeling Environment Induced Property Degradation of SiC-fiber Reinforced CMCs: *Triplicane Parthasarathy*¹; Qingda Yang²; Brian Cox³; Michael Braginsky⁴; Olivier Sudre⁵; Dipen Patel¹; Craig Przybyla⁶; Michael Cinibulk⁶; ¹UES Inc; ²University of Miami; ³Arachne Consulting; ⁴UDRI; ⁵Teledyne Scientific; ⁶Air Force Research Laboratory

3:20 PM

Life Limiting Behavior of Ceramic Matrix Composites (CMCs) under Static Interlaminar Shear Loading at Elevated Temperatures: *Sean Kane*¹; Sung Choi¹; D. Faucett¹; Luis Sanchez¹; ¹NAVAIR

3:40 PM

Effects of Rebounding Velocity of Projectiles on Foreign Object Damage (FOD) in Ceramic Matrix Composites (CMCs): *David Faucett*¹; Cajner Gong¹; Nes Kedir²; Sung Choi¹; ¹NAVAIR; ²Purdue University

4:00 PM

Inelastic Deformation Around Strain Concentrating Features in All-oxide Fiber Composites: *Avery Samuel*¹; Paul Christodoulou²; Frank Zok²; ¹University of California Santa Barbara; ²UCSB Materials Department

4:20 PM

Deformation and Failure in Pin-loaded All-oxide fiber Composites: *Paul Christodoulou*¹; Avery Samuel¹; Frank Zok¹; ¹University of California, Santa Barbara

International Symposium on Defects, Transport and Related Phenomena — Gas-Solid Interface Transport

Program Organizers: Tatsuya Kawada, Tohoku University; Manfred Martin, RWTH Aachen University; Sangtae Kim, University of California, Davis; William Chueh, Stanford University

Tuesday PM
October 16, 2018

Room: B242/243
Location: Greater Columbus Convention Center

Session Chairs: Nicola Perry, University of Illinois at Urbana-Champaign; Koji Amezawa, IMRAM, Tohoku University

2:00 PM Invited

Cathodic Reaction in SOFC and PCFC Investigated by Using Patterned Thin Film Model Electrode: *Koji Amezawa*¹; Keita Mizuno¹; Yuki Shinomiya¹; Yoshinobu Fujimaki¹; Takashi Nakamura¹; Yuta Kimura¹; Kiyofumi Nitta²; Oki Sekizawa²; Keiji Yashiro¹; Fumitada Iguchi¹; Hiroo Yugami¹; Tatsuya Kawada¹; ¹Tohoku University; ²JASRI

2:40 PM Invited

Crystallinity and Microstructure Effects on Oxygen Surface Exchange Kinetics of Mixed Conducting Oxides: Ting Chen¹; George Harrington²; Kazunari Sasaki¹; *Nicola Perry*³; ¹wpi-I2CNER, Kyushu University; ²MIT; ³University of Illinois at Urbana-Champaign

3:20 PM Invited

A Comparison of the Wafer Curvature and X-ray Diffractometry Determined Mechanical Properties, Defect Chemistry, and Electrochemical Performance of Praseodymium Doped Ceria Thin Films: Yuxi Ma¹; *Jason Nicholas*¹; ¹Michigan State University

4:00 PM

Oxygen Reduction Reaction on Ceria: Doping Matters: *Maximilian Schaubel*¹; Rotraut Merkle¹; Joachim Maier¹; ¹Max Planck Institute for Solid State Research

4:20 PM

Equivalent Circuit Analysis of Impedance Response and Potential Distribution in Multiple Carrier Electrolytes: Keiji Yashiro¹; Kotaro Okuyama¹; Arthur Bourdon¹; *Tatsuya Kawada*¹; ¹Tohoku University

Joining of Advanced and Specialty Materials (JASM XX) — Friction Stir and Friction Welding II/Other Solid State Joining Processes

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

Tuesday PM
October 16, 2018

Room: C171
Location: Greater Columbus Convention Center

Session Chairs: Zhenzhen Yu, Colorado School of Mines; Judy Schneider, University of Alabama at Huntsville

2:00 PM

Joining of Dissimilar Metals - Inconel718 and En24 Alloys by Continuous Drive Friction Welding: *Vijay Gaikwad*¹; ¹Bharat Forge Ltd.

2:20 PM Invited

High Speed Friction Stir Lap Welding of Automotive Al Alloys: *Piyush Upadhyay*¹; Xiao Li²; Tim Roosendaal²; ¹Pacific Northwest National Laboratory; ²Pacific Northwest National Laboratory

2:40 PM

Liquid Metal Embrittlement in Resistance Spot Welding of Zinc Coated Advanced High Strength Steel: *Erica Wintjes*¹; Andrew Macwan²; Elliot Biro²; Norman Zhou¹; ¹University of Waterloo; ²ArcelorMittal Global Research

3:00 PM

Impact Welding for Rapid Repair of Full-hard Precipitation Hardened Steel: *Bert Liu*¹; Anthony Palazotto¹; Anupam Vivek²; Glenn Daehn²; ¹Air Force Institute of Technology; ²The Ohio State University

3:20 PM

Microstructure and Strength of Aluminum Alloy Jointed by Piezoelectric Actuator Augmented Resistance Spot Welding: *Na Wu*¹; Shujun Chen¹; Jun Xiao¹; Wei Zhang²; Chaoxiong Hu¹; ¹Beijing University of Technology; ²The Ohio State University

3:40 PM

Effect of Surface Condition on Resistance Spot Welding of Press-hardened Steel: *Xu Han*¹; Mohammad Hadi Razmpoosh¹; Andrew Macwan²; Elliot Biro²; Norman Zhou¹; ¹University of Waterloo; ²ArcelorMittal Global Research

4:00 PM Invited

Spot Joining of AA 7085 and DP 1180 Steel Using a Friction Riveting Approach: Kevin Shirley¹; *Michael Miles*¹; Scott Grimshaw¹; Yong-Chae Lim²; Zhili Feng²; Eric Boettcher³; ¹Brigham Young University; ²Oak Ridge National Lab; ³Honda R&D

4:20 PM

Spot Impact Welding AA6111 Using Vaporizing Foil Actuator Welding: *Angshuman Kapil*¹; Taeseon Lee²; Anupam Vivek²; Ronald Cooper³; Elizabeth Hetrick³; Glenn Daehn²; ¹The Ohio State University; ²The Ohio State University, Department of Materials Science and Engineering; ³Ford Motor Company

TUESDAY PM

Joining of Advanced and Specialty Materials (JASM XX) — Welding Metallurgy I

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

Tuesday PM
October 16, 2018

Room: C172
Location: Greater Columbus Convention Center

Session Chairs: Hiroaki Mori, Osaka University; Carolin Fink, The Ohio State University

2:00 PM

Cracking During Powder Injection Laser Welding of Alloy G-30: *Ben Sutton*¹; Jeff Enneking²; Antonio Ramirez¹; ¹The Ohio State University; ²Framatome Inc.

2:20 PM

Hot Cracking Susceptibility of Alloy 617 by Vastrestraint Test: *Shotaro Yamashita*¹; Yusuke Morikawa¹; Kosei Hiramatsu¹; Tomo Ogura¹; Kazuyoshi Saida¹; Kenji Kamimura²; Yasuhiro Kamijyo²; Takahiro Niki²; ¹Osaka University; ²Toshiba Energy Systems & Solutions Corporation

2:40 PM

Weldability of Ta-bearing Ni-Base Filler Metal 52XL: *Luke Johnson*¹; Carolin Fink¹; John Lippold¹; Steve McCracken¹; ¹The Ohio State University

3:00 PM

Quantitative Evaluation of Reheat Cracking Susceptibility in Weld Metal of Ni-based Alloys: *Tomo Ogura*¹; Keisuke Kubota¹; Yuki Asahara¹; Shotaro Yamashita¹; Kazuyoshi Saida¹; ¹Osaka University

3:20 PM

Quantification of the Susceptibility to Ductility Dip Cracking in Welds of Ni-based Alloys: *Samuel Luther*¹; Boian Alexandrov¹; ¹Ohio State University

3:40 PM

Effect of Interstitial Elements on the Solidification Behavior of High Chromium, Nickel Base Filler Metals: *Louie Aguilar*¹; Carolin Fink¹; Steve McCracken²; ¹The Ohio State University; ²Electric Power Research Institute

4:00 PM

Stress Relief Cracking of High Temperature Alloys: *Rishi Kant*¹; John DuPont¹; ¹Lehigh University

4:20 PM

Welding Metallurgy and Weldability of High-temperature HEA System AlCoCrCuFeNi: *Alec Martin*¹; Carolin Fink¹; ¹Ohio State University

Light Metal Technology – Applications for the Transportation Industry — High Strength Aluminium Alloys

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

Tuesday PM
October 16, 2018

Room: B130
Location: Greater Columbus Convention Center

Session Chairs: Kaan Inal, University of Waterloo; Francisco Flores, NanoAI

2:00 PM

Characterization and Modeling of Aluminium Alloy 7075 in Naturally and Artificially Aged Conditions: *Julie Levesque*¹; Waqas Muhammad²; Augustin Gakwaya¹; ¹Laval University; ²University of Waterloo

2:20 PM

Forming of High Strength Aerospace Alloys Using the Vaporizing Foil Actuator Method: *Bhuvni Nirudhoddi*¹; Yu Mao¹; Anupam Vivek¹; Glenn Daehn¹; ¹The Ohio State University

2:40 PM

Mechanical Behaviors and Deformation Control of As-quenched Al-Cu Alloy for Large Aerospace Structures: *Qingyao Yuan*¹; Gang Wang²; Ke Ren³; Wenguang Wang¹; Yiming Rong³; ¹State Key Laboratory of Tribology, Tsinghua University; ²Tsinghua University; ³Mechanical and Energy Engineering Department, Southern University of Science and Technology of China

3:00 PM

The Effects of Laser Shock Peening on Fatigue, Corrosion and Corrosion Fatigue Properties of Al7075 Alloy: *Anurag Sharma*¹; Vijay Vasudevan¹; Seetha Mannava¹; Domenico Furfari²; ¹University of Cincinnati, Ohio; ²Airbus

3:20 PM

Laser Shock Processing of AZ31B Magnesium Alloy: The Generation of Gradient Twinning Microstructure: *Bo Mao*¹; Yiliang Liao¹; Bin Li¹; ¹University of Nevada, Reno

Manufacturing-Related Failures — Welding/Joining Failures

Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMS)

Tuesday PM
October 16, 2018

Room: A210
Location: Greater Columbus Convention Center

Session Chairs: Thomas Kozina, NTN Bearing Co.; Jonathan Trenkle, The NanoSteel Company; Debbie Aliya, Aliya Analytical Incorporated; Ronald Pietrowski, Con Edison; Mark Hineman, Engineering Systems Incorporated; Craig Schroeder, Element

2:00 PM

Failure Analysis of an Aircraft Fuel Line: *Milo Kral*¹; ¹University of Canterbury

2:20 PM

Fatigue Life Simulation of Pipeline Elbow under Cyclic Loading: *Xiankui Zhu*¹; ¹EWI



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

2:40 PM

Uncertainty and Sensitivity Analysis in Fatigue Life of Welded Joint Using Crystal Plasticity Simulations: *Takayuki Shiraiwa*¹; Manabu Enoki¹; ¹University of Tokyo

3:00 PM **Invited**

Non Destructive Screening of Solder BGAs for Lead-free Compliance: *Meredith Nevius*¹; Andrew Schultz¹; ¹Exponent Inc.

3:20 PM

Microstructure and Mechanical Behavior Associated to Linear Friction Welding Manufacturing Process: *Michael Mendoza*¹; Sanjeev Patil¹; Priyanka Agrawal¹; Alden Watts¹; Peter Collins¹; ¹Iowa State University

3:40 PM

Metallurgical Failure Analysis of a Fractured Chain Link Weld: *Craig Schroeder*¹; Dave Moore²; ¹Element; ²Unified Engineering

4:00 PM **Invited**

Weldment Related Residual Stresses in the Extreme: *Tim Jur*¹; Ronald Windham¹; ¹Engineering Design & Testing Corp

Materials for Nuclear Applications and Extreme Environments — Theory and Modeling of Nuclear Materials

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

Tuesday PM
October 16, 2018

Room: D183
Location: Greater Columbus Convention Center

Session Chair: Philip Edmondson, Oak Ridge National Laboratory

2:00 PM **Invited**

Thermodynamics of Nuclear Fuel: Model Development and Application: Jacob McMurray¹; Theodore Besmann²; *Dongwon Shin*¹; ¹Oak Ridge National Laboratory; ²University of South Carolina

2:40 PM

Compositional Control of Radionuclide Retention in Hollandite-based Ceramic Waste Forms for Cs-immobilization: *Kyle Brinkman*¹; Mingyang Zhao¹; Jake Amoroso²; Kristina Lilova³; Alexandra Navrotsky³; ¹Clemson University; ²Savannah River National Laboratory; ³University of California Davis

3:00 PM

Density Functional Theory Study of the Point Defect Energetics in γ -LiAlO₂, Li₂ZrO₃, and Li₂TiO₃ Materials: *Yueh-Lin Lee*¹; Jamie Holber¹; Hari Paudel¹; Dan Sorescu¹; Yuhua Duan¹; ¹National Energy Technology Laboratory

3:20 PM **Invited**

Mechanistic Mesoscale Modeling of Sintering for UO₂ Fuel Pellets: Ian Greenquist¹; *Michael Tonks*²; Yongfeng Zhang³; ¹Pennsylvania State University; ²University of Florida; ³Idaho National Laboratory

4:00 PM

Experimental Thermochemistry of Neptunium Compounds: *Lei Zhang*¹; Ewa Dzik¹; Samuel Perry¹; Sarah Hickam¹; Ginger Sigmon¹; Jennifer Szymanowski¹; Alexandra Navrotsky¹; Peter Burns¹; ¹University of Notre Dame

4:20 PM

Theoretical Investigation of Tritium Formations on the Surfaces of γ -LiAlO₂: *Ting Jia*¹; Hari Paudel¹; Zhi Zeng²; Yuhua Duan¹; ¹National Energy Technology Laboratory, United States Department of Energy; ²Key Laboratory of Materials Physics, Institute of Solid State Physics, Chinese Academy of Sciences

Materials Issues in Nuclear Waste Management — Corrosion Science in Nuclear Waste Management

Program Organizers: Cory Trivelpiece, Savannah River National Laboratory; Jason Lonergan, Washington State University; Jake Amoroso, Savannah River National Laboratory; Yutai Katoh, Oak Ridge National Laboratory; Kevin Fox, Savannah River National Laboratory; Josef Matyas, Pacific Northwest National Laboratory

Tuesday PM
October 16, 2018

Room: D282
Location: Greater Columbus Convention Center

Session Chair: Cory Trivelpiece, Savannah River National Laboratory

2:00 PM

Corrosion Monitoring in the Performance Confirmation Period of the Yucca Mountain Geologic Repository: *Raul Rebak*¹; ¹GE Global Research

2:20 PM **Invited**

The Role of CO₂ upon Early-stage Corrosion Reactions of ISG: *Robert Schaut*¹; Steven Tietje¹; Nicholas Smith¹; Chris Bourgeois¹; ¹Corning Incorporated

3:00 PM **Invited**

Materials Corrosion Issues in Nuclear Waste Management: *Joseph Ryan*¹; ¹Pacific Northwest National Laboratory

3:40 PM

The Evolving Distribution of Technetium within Cementitious Waste Forms During Leach Testing: *Matthew Asmussen*¹; Sarah Saslow¹; Joseph Westsik¹; Carolyn Pearce¹; Nikolla Qafoku¹; Jeffrey Serne¹; Gary Smith¹; ¹Pacific Northwest National Laboratory

4:00 PM

Formation and Structure of Passivating Gels by Reactive Molecular Dynamics Simulations: Tao Du¹; *Mathieu Bauchy*¹; ¹University of California, Los Angeles

Materials Property Understanding through Characterization — Novel Non-Metallic Materials

Program Organizers: Indrajit Dutta, Corning Incorporated; Nicholas Smith, Corning Incorporated

Tuesday PM
October 16, 2018

Room: B240/241
Location: Greater Columbus Convention Center

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

2:00 PM **Invited**

A Programmable Detector for STEM-in-SEM Imaging: *Jason Holm*¹; Benjamin Caplins¹; Robert Keller¹; ¹National Institute of Standards and Technology

2:40 PM **Invited**

Electrocatalyst Surface Wettability and its Correlation to Proton Exchange Membrane Fuel Cell (PEMFC) Performance: *Anastasios Angelopoulos*¹; ¹University of Cincinnati

TUESDAY PM

3:20 PM

Describing Brain Boundary Character through a Triple Junction Distribution Function: *Benjamin Schuessler*¹; David Field¹; ¹Washington State University

3:40 PM

The Reverse Direction of Modeling of Material Properties: *Vladimir Ginzburg*¹; ¹Int'l Rolling Mill Consultants, Inc.

4:00 PM

Domain Investigation in Lead-free $\text{Bi}_{0.5}\text{Na}_{0.5}\text{TiO}_3$ Based Thin Films and Ceramics by Piezoresponse Force Microscope: *Wei Ren*¹; Jinyan Zhao¹; Gang Niu¹; Nan Zhang¹; Lingyan Wang¹; Peng Shi¹; Ming Liu¹; Zuo-Guang Ye¹; ¹Xi'an Jiaotong University

4:20 PM

Use of Waste Gypsum from Hydrometallurgical Plant for the Recovery of Nickel from a Nickel Slag by Sulfurization: *Michel Kalenga Wa Kalenga*¹; Nurse Chauke¹; Willy Nheta¹; ¹University of Johannesburg

Microalloyed Steels — Microalloyed Steels I

Program Organizers: Emmanuel De Moor, Colorado School of Mines; Steven Jansto, CBMM-North America Inc; Robert Glodowski, RJG Metallurgical LLC

Tuesday PM
October 16, 2018

Room: A225
Location: Greater Columbus Convention Center

Session Chair: Emmanuel De Moor, Colorado School of Mines

2:00 PM

Development of Steel Plate for Large Heat Input Welding: *JaeYong Chae*¹; JaeYoung Cho¹; HwanGyo Jung¹; ¹POSCO

2:30 PM

Effects of Alloying on Hot Deformation Behavior of Nb Microalloyed Steels: *Evgueni Poliak*¹; Olga Girina¹; Steven Jansto¹; ¹Arcelormittal

2:50 PM

Modelling Precipitation and Austenite Grain Growth in Ti-Nb Microalloyed Steels: *Alexis Graux*¹; David De Castro²; Sophie Cazottes¹; Damien Fabrègue¹; Frédéric Danoix³; Matthieu Bugnet¹; Silvia Molas⁴; Jose Maria Cabrera⁵; Sebastian Schreiber⁶; Djordje Mirkovic⁷; Michel Perez¹; ¹MATEIS - INSA LYON; ²CENIM; ³GPM - Rouen; ⁴CTM; ⁵Universitat Politècnica de Catalunya; ⁶Thyssenkrupp Steel Europe; ⁷Salzgitter Mannesmann Forschung

3:10 PM Invited

Revisiting the Role of Nb Microalloying in Medium-high Carbon Long Products: Felipe Bastos¹; Beatriz Pereda²; Beatriz López²; Jose Rodriguez-Ibabe²; Marcelo Rebellato³; *Pello Uranga*²; ¹RMS and Tecnun (University of Navarra); ²CEIT and TECNUN (University of Navarra); ³RMS

3:30 PM

Effect of Al and B Alloying on Phase Transformation in Nb Microalloyed Q&P Steels: *Olga Girina*¹; Oleg Yakubovskiy¹; Damon Panahi¹; Steve Jansto²; ¹ArcelorMittal; ²CBMM North America, Inc.

3:50 PM

Interphase Precipitation in a Low-carbon, Titanium-molybdenum-vanadium Microalloyed Steel: *Caleb Felker*¹; John Speer¹; Gang Liu²; Emmanuel De Moor¹; ¹Colorado School of Mines; ²Baoshan Iron and Steel Co.

4:10 PM

Effect of Nb and Ti on the Microstructure, Texture and Tensile Properties of Al Added Low Density Medium Mn Steel: *Arnab Sarkar*¹; Tapas.Kr Bandyopadhyay¹; ¹Indian Institute of Technology Kharagpur

Modern Ceramic Manufacturing Methods and Applications — Modern Ceramic Manufacturing Methods and Applications

Program Organizers: Keith DeCarlo, Blasch Precision Ceramics; William Carty, Alfred University; Nik Ninos, Calix Ceramic Solutions

Tuesday PM
October 16, 2018

Room: A120
Location: Greater Columbus Convention Center

Session Chair: Keith DeCarlo, Blasch Precision Ceramics

2:00 PM Invited

A Unified Approach to Ceramic Forming Processes Using Specific Volume Diagrams: *William Carty*¹; ¹Alfred University

2:40 PM

Electrostatic and Electrosteric Stabilization of SiC and B4C: *Alexander Turner*¹; Hyojin Lee¹; Holly Shulman¹; William Carty¹; ¹New York State College of Ceramics at Alfred University

3:00 PM

Eliminating Ceramic Powder Agglomerates for Improved Microstructures: *Sarah Whipkey*¹; Hyojin Lee¹; William Carty¹; ¹Alfred University

3:20 PM Invited

Perspectives on Additive Manufacturing of Ceramics via Robocasting: *Joe Cesarano*¹; ¹Robocasting Enterprises

3:50 PM Invited

Design and Characterization of Ceramics by Lithography-based Additive Manufacturing: *Shawn Allan*¹; ¹Lithoz America LLC

4:20 PM

Engineering Powders for Ceramic 3-D Printing: Patrick Cigno¹; *William Carty*¹; ¹Alfred University

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

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

Tuesday PM
October 16, 2018

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

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

2:00 PM Invited

Excellent Friction and Anti-wear Reduction Properties of Carbon Nanomaterials Dispersed Mineral Oil: Sneha Sruthi V¹; Ramaprabhu S¹; *Kamaraj M*¹; ¹Indian Institute of Technology Madras

2:40 PM

3D Self-supported Anatase-Brookite Photocatalytic Nanomats: *Gagan Jodhani*¹; Selda Topcu²; Pelagia Gouma¹; ¹Ohio State University; ²Erciyes University

3:00 PM

Biofuel Cells with Pressure-immobilized Enzymes on Carbon Nanotube Sheets: *Biao Leng*¹; Laila Al-Qarni¹; ¹New Jersey Institute of Technology



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COLUMBUS, OHIO, USA

3:20 PM

Conduction Mechanisms in Nanostructured Metal-oxide Gas Sensors:

Mohamad Al-Hashem¹; Sheikh Akbar¹; Patricia Morris¹; ¹Ohio State University;

3:40 PM

Effect of Electrospun Nanofibers on Growth Behavior of Fungal Cells:

Arifa Parveen¹; ¹North Carolina A & T State University

4:00 PM

Effect of Graphene Hybridization on the Photocatalytic Behavior of Au Doped ZnO-GO Nanocomposite:

Syed Ahmed¹; Waseem Haider¹; ¹Central Michigan University

4:20 PM

Electrocatalytic Disinfection Using Nanostructured Titanium Suboxides:

Hammad Malik¹; Krista Carlson¹; ¹University of Utah

Next Generation Biomaterials — Biomaterials III

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

Tuesday PM

October 16, 2018

Room: D182

Location: Greater Columbus Convention Center

Session Chairs: Enrico Bernardo, University of Padova; Xanthippi Chatzistavrou, Michigan State University

2:00 PM Invited

SEM Study of Simulated Clinical Use for Third-generation NiTi Files:

Thomas Burke¹; John Nusstein¹; Melissa Drum¹; Sara Fowler¹; William Brantley¹; John Draper¹; ¹Ohio State University

2:20 PM Invited

Glass-ceramic Scaffolds by Additive Manufacturing of Engineered Glass-Silicone Mixtures:

Hamada Elsayed¹; Martiniano Picicco²; Jozef Kraxner³; Arish Dasan³; Enrico Bernardo¹; ¹University of Padova; ²CETMIC, La Plata; ³FunGlass – Centre for Functional and Surface Functionalized Glass

2:40 PM Invited

Improvement of Mechanical Properties of the Mg – Zr – Nd Alloy by Chemical Composition Optimization and Alloying with Silver:

Nikita Aikin¹; Vadim Shalomeev¹; Sergey Sheyko¹; ¹Zaporozhye National Technical University

3:00 PM Invited

Microwave Processing of Bioceramics:

Yufu Ren¹; Prabaha Sikder¹; Sarit Bhaduri¹; ¹University of Toledo

3:20 PM Invited

New Dental Composites with Bioactive and Bactericidal Properties:

Xanthippi Chatzistavrou¹; Anna Lefkelidou²; Lambrini Papadopoulou²; Christopher Fenno³; Susan Flannagan³; Carlos González-Cabezas³; Nikos Kotsanos²; Petros Papagerakis³; ¹Michigan State University; ²Aristotle University of Thessaloniki; ³University of Michigan

3:40 PM

The Antibacterial Efficiency & Biocompatibility of an Ag Containing Bioactive Bone Void Filler:

Lawrence Sanders¹; Kapil Raghuraman¹; Aisling Coughlan¹; ¹University of Toledo

4:00 PM Invited

Structural Design of Borosilicate Based Bioactive Glasses:

Ashutosh Goel¹; Nicholas Stone-Weiss¹; Randall Youngman²; Hellmut Eckert³; Eric Pierce⁴; Nicholas Smith²; ¹Rutgers, The State University of New Jersey; ²Corning Incorporated; ³Universidade de Sao Paulo; ⁴Oak Ridge National Laboratory

4:20 PM

An Osteoconductive Zn-bioactive Glass Treats 99.99% of Common Surgical Site Infections:

Kapil Raghuraman¹; Lawrence Sanders¹; Aisling Coughlan¹; ¹University of Toledo

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

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

Tuesday PM

October 16, 2018

Room: A125

Location: Greater Columbus Convention Center

Session Chairs: Joe Cresko, U.S. Department of Energy; Hideyuki Kanematsu, Suzuka National College of Technology

2:00 PM Invited

Soft Processing (= Green Processing) for Nano Carbons: Direct Fabrication of Functionalized Graphenes and Their Hybrids Inks via Submerged Liquid Plasma [SLP] and Electrochemical Exfoliation [ECE] under Ambient Conditions:

Masahiro Yoshimura¹; ¹National Cheng Kung University

2:40 PM Invited

Interpreting Non-thermal Microwave Effects on Materials Process Enhancements: A Straightforward Irreversible Thermodynamic Approach:

Boon Wong¹; ¹Retired

3:10 PM Invited

Microwave Effect in the Crystallization Process of Glass-ceramics Materials:

Morsi Mahmoud¹; ¹King Fahd University of Petroleum & Minerals

3:40 PM

Experimental Measurement of Dielectric Properties of Powdery Materials: Towards a Standard Testing Procedure for Paraffin Mixtures:

Robert Tempke¹; Terrence Musho¹; Christina Wildfire²; Dushyant Shekhawat²; Michael Spencer⁴; ¹WVU; ²NETL/ORISE; ³NETL; ⁴AECOM

4:00 PM

Microwave Radiation-assisted Synthesis of Ceramic Oxide Thin Films: Electromagnetic Field Effects on Atomic Structure:

Nathan Nakamura¹; Maxwell Telmer¹; Elizabeth Culbertson²; Simon Billinge²; B. Reeya Jayan¹; ¹Carnegie Mellon University; ²Columbia University

4:20 PM

Enrichment of Rare Earths from Coal Fly Ash through Microwave-assisted Comminution and Microwave Pyrometallurgy:

Edward Sabolsky¹; Gunes Yakaboylu¹; Katarzyna Sabolsky¹; John Zondlo¹; Terence Musho¹; Christina Wildfire²; Dushyant Shekhawat²; ¹West Virginia University; ²US DOE-National Energy Technology Laboratory

4:40 PM

Development of Magnetolectric Gytrators with Multi-outputs:

Chung Ming Leung¹; Xin Zhuang²; Junran Xu²; Jiefang Li²; Dwight Viehland²; ¹Virginia Polytechnic Institute; ²Virginia Tech

TUESDAY PM

PSDK XIII: Phase Stability and Diffusion Kinetics — Thermodynamics: Modeling and Experiments

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

Tuesday PM
October 16, 2018

Room: A213
Location: Greater Columbus Convention Center

Session Chairs: Hans Seifert, KIT; Hojong Kim, PSU

2:00 PM Invited

Determining Thermodynamic Properties of Alkaline-earths (Ba, Ca, and Sr) in Liquid Metals Using Electromotive Force Technique: *Hojong Kim*¹; ¹Pennsylvania State University

2:30 PM

The Impact of Alloy Elements to the Secondary Phase Stabilities in Grade 91 Alloy: Andrew Smith¹; Mohammad Asadikiya²; *Yu Zhong*²; ¹Florida International University; ²Worcester Polytechnic Institute

2:50 PM

High Throughput Magnetic Modeling of Cr-Fe-Ni Sigma Phase Working Toward a Description of Nickel Based Alloys: *Matthew Feurer*¹; Pinwen Guan¹; Shunli Shang¹; Allison Beese¹; Zi-Kui Liu¹; ¹Penn State University

3:10 PM

Re-assessment of the Ga-Li System: *Joel Fels*¹; Thomas Reichmann²; Dajian Li¹; Hans Jürgen Seifert¹; ¹Karlsruher Institute of Technology; ²G-Technology GmbH

3:30 PM Invited

Electrochemical-thermodynamics of Lithium Batteries: *Hans Seifert*¹; Weibin Zhang¹; Yong Du²; ¹Karlsruhe Institute of Technology; ²Central South University (CSU)

4:00 PM

Thermodynamic Evaluation of La_{1-x}Sr_xMnO_{3-d} Cathode in the Presence of Cr-containing Humidified Air: Shadi Darvish¹; *Yu Zhong*¹; ¹Florida International University

4:20 PM

Phase Stability and Mechanical Properties of Beta-phase Dendrites in Metallic Glass Matrix Composites: *Yaxian Wang*¹; Michael Gibbons¹; Nicolas Antolin¹; Wolfgang Windl¹; ¹Ohio State University

Rare Earth Metals and Critical Materials: Synthesis, Processing, Production, Recent Advances — Rare Earth Metals for Medical and Light Weight Structural Applications

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

Tuesday PM
October 16, 2018

Room: B131
Location: Greater Columbus Convention Center

Session Chairs: David Dunand, Northwestern University; Yellapu Murty, MC Technologies

2:00 PM Invited

Nanophotonic Rare-earth Based Probes for Early Detection of Cancer: Vidya Ganapathy¹; Charles Roth¹; Mark Pierce¹; Prabhas Moghe¹; *Richard Riman*¹; ¹Rutgers University

2:40 PM

Developing Lanthanoid-bearing Aluminum-based Metallic Glasses for Selective Laser Melting: *Joe Croteau*¹; David Seidman²; David Dunand²; Nhon Vo¹; ¹NanoAl LLC; ²Northwestern University

3:10 PM

Aluminum-cerium Alloys for Laser Powder Bed Fusion and Direct Metal Write Applications: *Hunter Henderson*¹; Zachary Sims²; Michael Kesler³; Alex Plotkowski; Max Neveau²; Scott McCall⁴; David Weiss⁵; Ryan Ott⁶; Ryan Dehoff³; Orlando Rios³; ¹Oak Ridge National Laboratory; ²University of Tennessee; ³Oak Ridge National Lab; ⁴Lawrence Livermore National Laboratory; ⁵Eck Industries, Inc.; ⁶Ames Laboratory

3:40 PM Invited

Developments in Al-Ce Alloy Casting and Post-processing: *David Weiss*¹; Orlando Rios²; Zachary Sims²; Hunter Henderson²; Scott McCall³; Ryan Ott⁴; Aurelien Perron³; ¹ECK Industries Inc; ²Oak Ridge National Laboratory; ³Lawrence Livermore National Laboratory; ⁴The Ames Laboratory

4:20 PM Invited

Partially Replacing Sc with Er and Yb in L12-Strengthened Aluminum Alloys: *David Dunand*¹; David Seiman¹; Nhon Vo²; ¹Northwestern University; ²Nanoal, LLC

Responsive Functional Nanomaterials — Functional Nanomaterials for Energy and Sensing

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

Tuesday PM
October 16, 2018

Room: D181
Location: Greater Columbus Convention Center

Session Chair: Zhen Liu, Frostburg State University

2:00 PM

Kinetic Studies of Indoor Volatile Organic Compounds Removal with Functional TiO₂-based Coating: Xiong (Bill) Yu¹; *Zhuoying Jiang*¹; ¹Case Western Reserve University



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2:20 PM
Light Illumination Room Temperature Gas Sensing Mechanism of ZnO/SnO₂ Heterostructures: *BuYu Yeh*¹; Akbar Sheikh¹; Morris Patricia¹; ¹The Ohio State University

2:40 PM
Localizing Microwave Heat by Surface Polarization of Titanate Nanostructures for Enhanced Catalytic Reaction Efficiency: *Tuo Ji*¹; Jiahua Zhu¹; ¹University of Akron

3:00 PM Invited
Highly Transparent and Flexible Triboelectric Nanogenerators: *Fengru Fan*¹; ¹University of California, Santa Barbara

3:40 PM
Organic Bullet Resistance System: *Brent Patterson*¹; Zhen Liu¹; ¹Frostburg State University

4:00 PM Panel Discussion

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

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

Tuesday PM Room: A220
 October 16, 2018 Location: Greater Columbus Convention Center

Session Chairs: Matthew Asmussen, Pacific Northwest National Laboratory; Jeff Binns, NWMO

2:00 PM Keynote
The Roles of Alloy Composition, External Oxygen Reduction and Internal Proton Reduction in the Crevice Corrosion of Ni-Cr-Mo Alloys: Jeff Henderson¹; Nafiseh Ebrahimi¹; Vahid Dehnavi¹; David Shoosmith¹; *James Noel*¹; ¹The University of Western Ontario

2:40 PM
Materials Selection to Avoid Corrosion in Wet Flue Gas Desulfurization (FGD) System Absorbers and Components: *John Shingledecker*¹; Steve Kung¹; ¹Epr

3:00 PM
Comparison of the Corrosion Behavior of Automotive Wrought and Ablation Cast Al-Mg-Si Alloys: *Dadi Zhang*¹; Jenifer Locke¹; ¹The Ohio State University

3:20 PM
Machine Learning Approach to Predict Cyclic Oxidation Behavior of Ni-based Alloys: *Jiheon Jun*¹; Dongwon Shin¹; Sebastien Dryepondt¹; Govindarajan Muralidharan¹; J. Allen Haynes¹; Bruce Pint¹; ¹Oak Ridge National Lab

3:40 PM
Diffusion of CR In the Haynes 230 Alloy during Corrosion in MGCL₂-KCL Molten Salt: *Yuxiang Peng*¹; Ramana Reddy¹; ¹University of Alabama

4:00 PM
Dew Point Corrosion Behavior of Steels in Exhaust Systems: *Minho Jo*¹; Byoung Ho Lee¹; ¹Posco

4:20 PM
The Influence of Thermal Cycle Frequencies on the Parabolic Rate Constants of Alloys: *Joseph Meyer*¹; ¹Haynes International

Sintering and Related Powder Processing Science and Technologies — Field Assisted Sintering I: Fundamentals

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

Tuesday PM Room: B142/143
 October 16, 2018 Location: Greater Columbus Convention Center

Session Chair: Zachary Cordero, Rice University

2:00 PM Invited
On the Mixed Conduction in Ytria Stabilized Zirconia in High Electric Fields: *Reiner Kirchheim*¹; ¹University of Goettingen

2:40 PM Invited
The Scientific Questions and Technological Opportunities of Flash Sintering: From a Case Study of ZnO to Other Ceramics: *Jian Luo*¹; ¹University of California, San Diego

3:20 PM Invited
Grain Growth during Spark Plasma and Flash Sintering of Ceramic nNanoparticles: *Rachman Chaim*¹; Geoffroy Chevallier²; Alicia Weibel²; Claude Estournes²; ¹Israel Institute of Technology; ²Université de Toulouse

4:00 PM
A Mathematical Approach to Spark Plasma Sintering of Amorphous Alloys: *Tanaji Paul*¹; Sandip Harimkar¹; ¹Oklahoma State University

4:20 PM
Controllable Interface Approach in Field-assisted Sintering: *Eugene Olevsky*¹; Charles Maniere²; Geuntak Lee²; Elisa Torresani²; ¹San Diego State University; ²San Diego State Univ

Small-scale Properties of Materials and Length-scale Phenomena — Structure I

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

Tuesday PM Room: A121
 October 16, 2018 Location: Greater Columbus Convention Center

Session Chairs: Erik Herbert, Michigan Technological University; Afrooz Barnoush, Norwegian University of Science and Technology

2:00 PM Invited
Pop-in Behavior during Nanoindentation: Elastic-plastic Transitions Versus Limited Slip Conditions: *David Bahr*¹; Raheleh Rahimi¹; Alexandra Burch¹; Michael Maughan²; Sichuang Xue¹; Xinghang Zhang¹; ¹Purdue University; ²University of Idaho

TUESDAY PM

2:20 PM Invited

Modeling Slip Transmission across Alpha/Beta Interface in Ti-alloys Using Microscopic Phase-field: *Pengyang Zhao*¹; Chen Shen²; Ju Li³; Stephen Niezgod⁴; Michael Mills¹; Yunzhi Wang¹; ¹Ohio State University; ²GE Global Research; ³MIT

2:40 PM Invited

Quantifying Crack Growth in Ultrathin Ductile Sheets: Wade Lanning¹; Syed Javaid¹; Camilla Johnson¹; *Christopher Muhlstein*¹; ¹Georgia Institute of Tech

3:00 PM

In-situ Stable Crack Growth at the Micron Scale: *Giorgio Sernicola*¹; T. Ben Britton¹; Finn Giuliani¹; ¹Imperial College London

3:20 PM Invited

Analysis of Indentation Creep for High Hardness/Modulus Ratio Materials: *Donald Stone*¹; Z. Humberto Melgarejo²; Joseph Jakes³; Yousuf Mohammed⁴; Abdelmageed Elmoustafa⁴; ¹University of Wisconsin; ²Univ of Wisconsin; ³USDA Forest Products Laboratory; ⁴Old Dominion University

3:40 PM Invited

Defect Structure and Migration Dynamics in Two Dimensional (2d) Crystals and Van Der Waals Heterostructures: *Nasim Alem*¹; ¹Pennsylvania State University

4:00 PM Invited

Understanding the Role of Interfaces on Solute Segregation in Nanocrystalline Materials and Its Influence on Mechanical Behavior: *Ankit Gupta*¹; Garritt J. Tucker¹; ¹Colorado School of Mines

Solid State Processing — Friction Stir Processing and Other Torsion Processing Techniques

Program Organizers: Richard Fonda, Naval Research Laboratory; Simon Larose, National Research Council Canada

Tuesday PM
October 16, 2018

Room: B140/141
Location: Greater Columbus Convention Center

Session Chair: Paul Allison, University of Alabama

2:00 PM Invited

The Non-equilibrium Processing Nature of Additive Friction Stir Deposition: *Hang Yu*¹; ¹Virginia Tech

2:20 PM

Microstructure-property Relationship on Stress-state and Strain-rate Behavior of AM AFS-Deposition Aluminum Alloy 6061: *Brandon Phillips*¹; Dustin Avery¹; C. J. T. Mason¹; Paul Allison¹; J. B. Jordan¹; ¹The University of Alabama

2:40 PM

Friction Stir Processing of Super Duplex Stainless Steel and its Effect on Tensile Properties: *Nithyanand Prabhu*¹; Manjesh Kumar Mishra¹; A. Gourav Rao²; I. Balasundar³; B. P. Kashyap⁴; ¹Indian Institute Of Technology Bombay; ²Naval Materials Research Laboratory; ³Defence Metallurgical Research Laboratory; ⁴Indian Institute of Technology Jodhpur

3:00 PM

Processing, Microstructural Evolution and Strength Properties of Copper Matrix Composites Containing Nano-sized Polymer Derived SiCN Particles: *Ajay Kumar P*¹; Satish Kailas²; ¹University of Wisconsin-Milwaukee, Materials Dept; ²Indian Institute of Science, Bangalore

3:20 PM

Characterization of Pure Copper Wire Produced by Shear-ssisted Processing and Extrusion: *Xiao Li*¹; Glenn Grant¹; ¹Pacific Northwest National Lab

3:40 PM

Achieving High-strength Zn-Mg Hybrids through High-pressure Torsion: *David Hernández Escobar*¹; Hakan Yilmazer²; Megumi Kawasaki³; Carl Boehlert¹; ¹Michigan State University; ²Yildiz Technical University; ³Oregon State University

4:00 PM

Multi-objective Optimization of Multi-channel Spiral Twist Extrusion Process Using a Response Surface Approach and Finite Element Analysis: *Dina Fouad*¹; Amr Moataz¹; Waleed El-Garaihy²; Hanadi Salem¹; ¹The American University in Cairo, Egypt; ²Suez Canal University, Ismailia, Egypt

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

Program Organizer: Amber Black, Los Alamos National Laboratory

Tuesday PM
October 16, 2018

Room: B232
Location: Greater Columbus Convention Center

Session Chair: Amber Black, Los Alamos National Laboratory

2:00 PM

Current and Future Applications of Rare Earth Phosphors and Nanophosphors: *Josh Collins*¹; ¹Intelligent Material Solutions, Inc.

2:20 PM

ALD NanoSolutions, Inc. – from Lab Curiosity to Commercial Market Development Plants: *Alan Weimer*¹; ¹University of Colorado

2:40 PM

Magnetically Textured Ceramic-Polymer Composites for High Strength Applications: *Randall Erb*¹; ¹DAPS Lab

3:00 PM

Patenting Strategies for Small Business: *Van Vekris*¹; ¹Sim & McBurney

3:20 PM

The Transition to Commercialization: *Alexander Smith*¹; ¹Swift Textile Metalizing

3:40 PM Panel Discussion



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

Surface Protection and Spray Technology for Enhanced Materials Performance: Science, Technology, and Application — Cold Spray Coatings

Program Organizers: Kang Lee, NASA Glenn Research Center; Jun Song, McGill University; Yutaka Kagawa, The University of Tokyo; Dongming Zhu, NASA Glenn Research Center; Rodney Trice, Purdue University; Daniel Mumm, University of California, Irvine; Mitchell Dorfman, Oerlikon Metco (US) Inc.; Christian Moreau, Concordia University; Emmanuel Boakye, UES Inc.; Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory; Richard Chromik, McGill University; Stephen Yue, McGill University

Tuesday PM
October 16, 2018
Room: B234
Location: Greater Columbus Convention Center

Session Chairs: Jun Song, McGill University; Richard Chromik, McGill University

2:00 PM Invited

The Effect of Metal Powder Properties on the Cold Spray of Ti Metal-matrix Composites: *Venkata Naga Vamsi Munagala*¹; Rohan Chakrabarty¹; Jun Song¹; Richard Chromik¹; ¹McGill University

2:40 PM

The Role of Ceramic Characteristics in Cold Sprayed Metal/Ceramic Interfaces: *Sara Imbriglio*¹; Raynald Gauvin¹; Nicolas Brodusch¹; Maniya Aghasibeig²; Richard Chromik¹; ¹McGill University; ²National Research Council Canada

3:00 PM

Cold Spraying of Mixed Sn-Al Powders: *Andre Liberati*¹; Hanqing Che¹; Phuong Vo²; Stephen Yue¹; ¹McGill University; ²National Research Council Canada

3:20 PM

Understanding Ceramic Deposition and Bonding in Metal-ceramic Composite Cold Spray from Finite-element Studies: Rohan Chakrabarty¹; Jun Song¹; ¹McGill University

3:40 PM

Cold Spray Characteristics of Bimodal Size 316L/Fe Powder Mixtures: *Xin Chu*¹; Phuong Vo²; Stephen Yue¹; ¹McGill University; ²National Research Council Canada

Synergy in Multiscale Modeling and Experiments to Resolve Complex Disordered Solids — Session I: Multi-scale Modeling-driven Synergy

Program Organizers: Ridwan Sakidja, Missouri State University; Jinwoo Hwang, Ohio State University; Jincheng Du, University of North Texas; Matthew Kramer, Iowa State University; David Drabold, Ohio University

Tuesday PM
October 16, 2018
Room: B246
Location: Greater Columbus Convention Center

Session Chairs: Jincheng Du, University of North Texas; Ridwan Sakidja, Missouri State University

2:00 PM Invited

Local Order in Metallic Liquids and Glasses: *Matthew Kramer*¹; Y Sun¹; F. Zhang¹; C.Z. Wang¹; K.M. Ho¹; M.I. Mendeleev¹; ¹Ames Laboratory

2:40 PM Invited

Structure and Properties of Multicomponent Nuclear Waste Glasses: Insights from Molecular Dynamics Simulations: *Jincheng Du*¹; ¹University of North Texas

3:10 PM

Mesoscale Model of Metallic Glass Nanomechanical Experiments: Achieving Matching Length and Time Scales: *Thomas Hardin*¹; Christopher Schuh¹; ¹Massachusetts Institute of Technology

3:40 PM

Predictive Design and Fabrication of Complex Disordered Solids: Modeling of Pre-Ceramic Polymers: *Paul Rulis*¹; Michelle Paquette¹; Jinwoo Hwang²; Ridwan Sakidja³; Nathan Oyler⁴; ¹UMKC Dept. Physics and Astronomy; ²The Ohio State University; ³Missouri State University; ⁴UMKC Department of Chemistry

4:10 PM

Molecular Dynamics Simulation Study on Amorphous B4C: *Nirmal Baishnab*¹; Rajan Khadka¹; Ridwan Sakidja¹; ¹Missouri State University

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

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

Tuesday PM
October 16, 2018
Room: B144/145
Location: Greater Columbus Convention Center

Session Chair: Kevin Huang, University of South Carolina

2:00 PM Invited

Defect-driven Nanoporous Electrode Materials for Energy Storage Systems: *Hui Xiong*¹; ¹Boise State University

2:20 PM

Freeze Tape Casting: A Promising Fabrication Technique for High Energy Density Electrodes for Li-Ion Batteries: *Milad Azami Ghadkolai*¹; Lakshman Ventrapragada¹; Stephen Creager¹; Rajendra Bordia¹; ¹Clemson University

2:40 PM

Hybrid Silicon and Carbon-Based Polymers: Processing, Characterization and Properties: *Michelle Greenough*¹; Rajendra Bordia¹; ¹Clemson University

3:00 PM

Template-free Synthesis of Highly Ordered Mesoporous Carbons (HOMCs) for Supercapacitor Applications: *Tugrul Yumak*¹; Gunes Yakaboylu¹; Changle Jiang¹; John Zondlo¹; Jingxin Wang¹; Edward Sabolsky¹; ¹West Virginia University

3:20 PM Invited

Fabrication and Mechanical Behavior of Bulk Micro-sized Porous Cu via Electrochemical De-alloying of Cu-Fe Alloys: *Fei Chen*¹; Lijie Zou¹; Hao Wang¹; Qiang Shen¹; Lianmeng Zhang¹; ¹Wuhan University of Technology

3:40 PM

Ultrahigh Surface Area Meso/Microporous Carbon Formed with Self-template for High-voltage Aqueous Supercapacitors: *Haibiao Chen*¹; ¹Peking University Shenzhen Graduate School

4:00 PM

Silica-based Aerogel Membranes Fabricated Using Removable Nitrocellulose Scaffolds: *Bonan Wang*¹; Krista Carlson¹; Alexander Reifsnnyder¹; ¹University of Utah

TUESDAY PM

4:20 PM

Production of a Coal Fly Ash-based Coagulant Using Sulphuric Acid Solutions: *Momboyo Clotilde Apua*¹; Geoffrey S. Simate¹; ¹University of the Witwatersrand

4:40 PM Concluding Comments

Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications — High Performance Additively Manufactured Alloys

Program Organizers: Ali Yousefiani, Boeing Research And Technology; Troy Topping, California State University, Sacramento; Robert Dillon, Jet Propulsion Laboratory; Linruo Zhao, NRC Aerospace

Tuesday PM
October 16, 2018

Room: B235
Location: Greater Columbus Convention Center

Session Chair: Robert Dillon, NASA Jet Propulsion Laboratory

2:00 PM Invited

High-performance Magnetic Alloys and Gradients through Additive Manufacturing: *Robert Dillon*¹; Samad Firdosy¹; Ryan Conversano¹; Bryan McEnerney¹; John Paul Borgonia¹; Dan Goebel¹; Andrew Shapiro-Scharlotta¹; ¹Jet Propulsion Laboratory

2:30 PM Invited

Mechanical and Wear Properties of Zr-based Bulk Metallic Glasses Produced by Additive Manufacturing: *Punnathat Bordeenithikasem*¹; Yiyu Shen²; Moritz Stolpe³; Alexander Elsen³; Hai-Lung Tsai²; Douglas Hofmann¹; ¹Jet Propulsion Laboratory, California Institute of Technology; ²Missouri University of Science and Technology; ³Heraeus Additive Manufacturing GmbH

3:00 PM

Binder Jetting 3D Printing of Fe77Ni5.5Co5.5Zr7B4Cu1 Magnetic Powders: *Rafaela Vannutelli*¹; Matthew Caputo¹; Stephen Isacco¹; Yash Trivedi¹; Matthew Willard²; *C. Virgil Solomon*¹; ¹Youngstown State University; ²Case Western Reserve University

3:20 PM

Spall Prevention in Additively Manufactured Composites under Hypervelocity Impact Conditions: *Lauren Poole*¹; Matthew French¹; William Yarberr¹; Zachary Cordero¹; ¹Rice University

3:40 PM Invited

Developing Aluminum-rich Metallic Glasses for Selective Laser Melting: *Joe Croteau*¹; David Seidman²; David Dunand²; Nhon Vo¹; ¹NanoAl LLC; ²Northwestern University

10th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Session IV

Program Organizers: Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technology; Surojit Gupta, University of North Dakota; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin-Stout; Allen Applett, Oklahoma State University; Richard Sisson, Worcester Polytechnic Institute; Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology; Mritunjay Singh, Ohio Aerospace Institute

Wednesday AM
October 17, 2018

Room: B233
Location: Greater Columbus Convention Center

Session Chairs: Shijie Wang, Institute of Materials Research and Engineering (IMRE), A*STAR (Agency for Science); Surojit Gupta, University of North Dakota

8:00 AM Invited

Importance of Soft (= Green, Solution & Low-Energy) Processing of Advanced Ceramics for Sustainable Society: *Masahiro Yoshimura*¹; ¹National Cheng Kung University

8:20 AM Invited

Assembling of Graphene Scaffolds by Three-dimensional Printing: *Shaoming Dong*¹; Kai Huang²; Jinshan Yang²; ¹Shanghai Institute of Ceramics; ²Shanghai Institute of Ceramics, Chinese Academy of Sciences

8:40 AM

Low Emission Production Route for Titanium from Iron-sand Slag Using Ultra-high Temperature Electrolysis: Thomas Hughes¹; Samuel Martin-Treceno¹; Catherine Bishop¹; Aaron Marshall¹; *Matthew Watson*¹; ¹University of Canterbury

9:00 AM

Improvements in Environmental Impact of Industrial Chrome Stripping Processes: *Holly Garich*¹; Maria Inman¹; Stephen Snyder¹; Tim Hall¹; Brian Skinn¹; E. Jennings Taylor¹; ¹Faraday Technology, Inc.

9:20 AM Invited

Thermodynamics and Fractals on the Way to New Energy Frontiers: *Vojislav Mitic*¹; Goran Lazovic²; Vesna Paunovic³; Zoran Vosika³; Sandra Veljkovic³; Branislav Vlahovic⁴; ¹University of Nis; Institute of Technical Sciences of SASA; ²University of Belgrade; ³University of Nis; ⁴North Carolina Central University

10:00 AM Break

10:20 AM

Upgrading Ores or Concentrates which Contain Iron and One or More Metals via Selective Carbothermic Reduction and Smelting: *Basak Anameric*¹; ¹NRRI Coleraine Labs

10:40 AM

Sustainability Analysis of Die-casting Part at the Design Stage: Simranjit Sidhu¹; *Manjot Kaur*²; ¹Mechanical Engineering Department, Punjabi University Patiala; ²Punjabi University Patiala

11:00 AM

The Reaction of Molten Iron and CO₂ in Limestone Slagging Process: *Wenwen Mao*¹; Chenxiao Li²; Menglong Li¹; Mengying Li¹; ¹HBIS Group Tangsteel Company; ²North China University of Science and Technology



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GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

11:20 AM

Production of Ferrosilicon Alloy from the Pudo Iron Ore Using End-of-life Rubber Tyre as Reductant: *James Dankwah*¹; James Dankwah¹; Jessica Dankwah²; Pramod Koshy³; ¹University of Mines and Technology; ²Goldfields Ghana Limited (Damang Mine); ³University of New South Wales

11:40 AM

Pyrite as a Green Reagent for Remediation of Chromate-containing Wastewater: *Allen Apblett*¹; Travis Reed¹; Amelia Bergeson²; ¹Oklahoma State Univ; ²Tulane University

ACerS Robert B. Sosman Award Symposium: Lead-free Piezoceramics: From Local Structure to Application — Session I

Program Organizers: Jurij Koruza, Technische Universität Darmstadt; Jürgen Rödel, Technische Universität Darmstadt

Wednesday AM
October 17, 2018

Room: A111/112
Location: Greater Columbus Convention Center

Session Chairs: Jurij Koruza, Technische Universität Darmstadt; Andrew Bell, University of Leeds

9:00 AM Invited

Lead Free Piezoelectrics: The Environmental and Regulatory Issues: *Andrew Bell*¹; Otmar Deubzer²; ¹University of Leeds; ²Fraunhofer Institute for Reliability and Microintegration IZM

9:40 AM Invited

Dynamics of Polar Regions and Ferroelectric Domain Walls: *Dragan Damjanovic*¹; ¹EPFL SCI STI IDD

10:20 AM Break

10:40 AM Invited

Rotating a Phase Boundary: Potassium-sodium-niobate Derivates: *Ke Wang*¹; Barbara Malic²; Jiagang Wu³; Jing-Feng Li¹; ¹Tsinghua University; ²Jožef Stefan Institute; ³Sichuan University

Additive Manufacturing of Composites and Complex Materials III — Techniques and Applications

Program Organizers: Dirk Lehmhus, Fraunhofer - Ifam; Jonathan Spowart, Air Force Research Laboratory; Nikhil Gupta, New York University; Eric Jaegle, Max-Planck-Institut fuer Eisenforschung

Wednesday AM
October 17, 2018

Room: A222
Location: Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Introductory Comments

8:10 AM

Innovative Component Designs for Electric Motors Enabled by Additive Manufacturing: *Michael Halbig*¹; ¹NASA Glenn Research Center

8:30 AM

Designing Compositionally and Functionally Graded Steels Using Robotic Path Planning: *Olga Eliseeva*¹; Tanner Kirk¹; Ji Ma¹; Raymundo Arroyave¹; Richard Malak¹; Alaa Elwany¹; Ibrahim Karaman¹; ¹Texas A&M University

8:50 AM

In-situ Fabrication of Electro-mechanical Structures Using Multi-material and Multi-process Additive Manufacturing: *Tushar Saini*¹; Kashish Dhal¹; Panos Shiakolas¹; ¹University of Texas at Arlington

9:10 AM

Powder Modification to Enhance Alloys for Laser Based Additive Manufacturing: *John Sharon*¹; Paul Sheedy¹; ¹United Technologies Research Center

9:30 AM

High-throughput 3D Metal-matrix Composite Printing: Michael Sullivan¹; Deborah Chung¹; ¹State University of New York Buffalo

9:50 AM Invited

Spatial Strain Sensing Using Embedded Fiber Optics: *Adam Hehr*¹; Mark Norfolk¹; John Sheridan²; Matthew Davis³; Patrick Leser⁴; Paul Leser⁴; John Newman⁴; ¹Fabrisonic LLC; ²Sheridan Solutions LLC; ³Luna Innovations; ⁴NASA Langley Research Center

10:20 AM Break

10:40 AM

Selective Laser Melting (SLM) of Nitinol Stents: *Parastoo Jamshidi*¹; Sophie Cox¹; Jiling Feng²; Liguozhao³; Moataz Attallah¹; ¹University of Birmingham; ²Manchester Metropolitan University; ³Loughborough University

11:00 AM Invited

3D Inkjet Printing of Electrically Induced Metal-polymeric Actuators: *Ehab Saleh*¹; Asish Malas¹; Ian Ashcroft¹; Christopher Tuck¹; Ruth Goodridge¹; ¹University of Nottingham

11:20 AM

A Segregation Model Study of Suspension-based Additive Manufacturing: *Chang-Jun Bae*¹; John Halloran²; ¹Korea Institute of Materials Science (KIMS); ²University of Michigan

Additive Manufacturing of Metals: Microstructure and Material Properties — AM Superalloys - Microstructure and Properties

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

Wednesday AM
October 17, 2018

Room: A214
Location: Greater Columbus Convention Center

Session Chair: Christopher Rock, North Carolina State University

8:00 AM

Microstructural Evolution in Nickel Alloy 718 Produced by Laser-powder Bed Fusion Additive Manufacturing: *Hyeun Song*¹; Alber Sadek¹; Boulware Paul¹; Heimdall Mendoza¹; Rodrigo Enriquez¹; Curt Taylor¹; ¹EWI

8:20 AM

Scan Strategy Effects on Microstructure and Hardness of SLM IN718: *Gregory Cobb*¹; Ryan O'Hara¹; David Newell¹; Ben Doane¹; ¹Air Force Institute of Technology

8:40 AM

The Relationship between Geometry and Microstructure of Inconel 718 during Selective Laser Melting: *Lova Chechik*¹; Gavin Baxter²; Iain Todd¹; ¹MSE University of Sheffield; ²Rolls Royce plc

WEDNESDAY AM

9:00 AM

The Effect of Part Size on Additive Manufactured IN718 Parts: *Oliver Holzmond*¹; Guofeng Wang²; Xiaodong Li¹; ¹University of Virginia; ²University of Pittsburgh

9:20 AM

The Utility of Laser Powder Bed Parameters and Deposition Strategies in Creating Functionally Graded Microstructures in IN718: *Bonnie Attard*¹; Sam Cruchley¹; Yu-Lung Chiu¹; Moataz Attallah¹; ¹University Of Birmingham

9:40 AM

Inconel 718 Powder with Chemistry Variations and Its Impact on L-PBF Printed Samples: *Gerrit Kool*¹; Marc Smit¹; Ludo Bautmans²; Steve Nardone³; ¹Netherlands Aerospace Centre NLR; ²Oerlikon Eldim BV; ³ENGIE Laborelec

10:00 AM Break**10:20 AM**

Benchmarking Environmental Assisted Cracking Resistance of Alloy 718 API Grade Produced with Selective Laser Melting: Madison Burns¹; Helmuth Sarmiento-Klapper¹; *Christoph Wengenheim*¹; ¹Baker Hughes, a GE Company

10:40 AM

Abnormal Transient Creep of EBM Processed Alloy 718 at Intermediate Temperature: *Yuta Tanaka*¹; Tomomichi Ozaki¹; Keiji Kubushiro¹; ¹IHI Corporation

11:00 AM

Notched Fatigue Testing of Inconel 718 Prepared by Selective Laser Melting: *David Witkin*¹; Dhruv Patel¹; Glenn Bean¹; ¹Aerospace Corp

11:20 AM

Mechanical Properties and Microstructure Control of Alloy718 by Powder Based Processes: *Keiji Kubushiro*¹; Akihiro Sato¹; Koji Nezaki¹; ¹Ihi Corporation

11:40 AM

Material Characterisation of Selectively Laser Melted Haynes 282: *Alistair Lyle*¹; Alphons Antonysamy²; Iain Todd¹; ¹University of Sheffield; ²GKN Aerospace

Additive Manufacturing of Metals: Microstructure and Material Properties — Microstructure Control in AM Components

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

Wednesday AM

October 17, 2018

Room: A215

Location: Greater Columbus Convention Center

Session Chair: Ola Harrysson, North Carolina State University

8:00 AM Invited

Microstructure Control across AM Alloy Systems: Sneha Narra¹; Rahi Patel¹; *Jack Beuth*¹; ¹Carnegie Mellon University

8:40 AM

Microstructural and Compositional Optimizations for AM Ni-based Superalloys: *Marc Thomas*¹; ¹Onera

9:00 AM

Microstructural and Mechanical Properties Control Using Direct Laser Deposition in IN718 Ni-superalloy: *Abdullah Alhuzaim*¹; Luke Carter¹; R. Mark Ward¹; Moataz Attallah¹; ¹University of Birmingham

9:20 AM

Microstructural Evaluation of AM Fabricated Rene 41 Alloy: *Sila Ece Atabay*¹; Kevin Plucknett²; Mathieu Brochu¹; ¹McGill University; ²Dalhousie University

9:40 AM

Microstructure and Mechanical Properties Nickle Super Alloys Produced by Renishaw's Laser Powder Bed Fusion Systems: *Ravi Aswathanarayanawamy*¹; Laura Howlett¹; Marc Saunders¹; ¹Renishaw Plc

10:00 AM Break**10:20 AM**

Microstructures and Mechanical Properties of a 3D Printed Ti Alloy: *Punit Kumar*¹; Upadrasta Ramamurty¹; ¹Department of Materials Engineering, IISc Bangalore

10:40 AM

Microstructural Studies of the Effect of Process Parameters on Additively Manufactured NiTi: *Alejandro Hinojos*¹; Narges Shayesteh Moghaddam²; Soheil Saedi³; Natalie Zeleznik¹; Peter Anderson¹; Mohammad Elahinia²; Haluk Karaca³; Michael Mills¹; ¹The Ohio State University; ²University of Toledo; ³University of Kentucky

11:00 AM

Microstructural and Tensile Behavior of Selective Laser Melting Additive Manufacturing GRCop-84 Start-Stop Build Lines: Ryan Anderson¹; Stephen Cooke¹; Joseph Sims¹; *Judy Schneider*²; ¹ASRC Federal Astronautics; ²University of Alabama at Huntsville

Additive Manufacturing of Metals: Post Processing — Heat Treatment II

Program Organizers: Ola Harrysson, North Carolina State University; Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; S. Babu, Indian Institute of Technology Madras

Wednesday AM

October 17, 2018

Room: A216

Location: Greater Columbus Convention Center

Session Chair: Carter Keough, NC State University

8:00 AM Invited

High Pressure Heat Treatment of AM Parts: Combining HIP and Heat treatment: *Magnus Ahlfors*¹; ¹Quintus Technologies

8:40 AM

Scan Strategy Effects on SLM IN718, and Mitigating these Effects via Post Process Annealing: *David Newell*¹; Ryan O'Hara¹; Gregory Cobb¹; Ben Doane¹; ¹Air Force Institute of Technology

9:00 AM

Evolution of Microstructure During Thermal Post-treatment of EBM Processed Alloy 718: Sneha Goel¹; Fouzi Bahbou²; Anders Eklund³; Uta Klement⁴; *Shrikant Joshi*¹; ¹University West; ²Arcam AB; ³Quintus Technologies AB; ⁴Chalmers University of Technology

9:20 AM

Effects of Hot Isostatic Pressing and Annealing Heat Treatment on the Microstructure Evolution and Mechanical Properties of Selective Laser Melted Co-Cr-Mo Alloy: *Kyu-Sik Kim*¹; Jae-Won Hwang²; Kee-Ahn Lee¹; ¹Inha University; ²Changsung Corp.



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 COLUMBUS, OHIO, USA

9:40 AM

Additive Manufacturing and Hot Isostatic Pressing of Niobium-based Refractory Alloys: *Calvin Mikler*¹; Brian Welk¹; Gopal Viswanathan¹; Benjamin Georjin¹; Zachary Kloenne¹; Kevin Chaput²; John Foltz³; Hamish Fraser¹; ¹Ohio State Univ; ²Air Force Research Laboratory; ³ATI Specialty Alloys and Components

10:00 AM Break

10:20 AM

Effect of Heat Treatment on Microstructure and Mechanical Properties of Laser Deposited Haynes 282 Superalloy: *Abhishek Ramakrishnan*¹; Guru Dinda¹; Aniket Dighe¹; ¹Wayne State University

10:40 AM

Influence of Processing and Post-processing Parameters on the Final Properties of Powder-bed Laser Additively Manufactured Parts: *Aziz Chniouel*¹; Fernando Lomello¹; Pierre-François Giroux²; Pascal Aubry¹; Hicham Maskrot¹; ¹Den-Service d'Etudes Analytiques et de Réactivité des Surfaces (SEARS), CEA, Université Paris-Saclay; ²Den-Service de Recherches Métallurgiques Appliquées (SRMA), CEA, Université Paris-Saclay

11:00 AM

LBPF Processed Nickel-iron Soft-magnetic Alloy: Influence of Heat Treatments on Density, Microstructure and Magnetic Properties: *Thomas Bauer*¹; Adriaan Spierings¹; Konrad Wegener¹; ¹Inspire AG

11:20 AM

Elementary Guide to Heat Treating Additive Manufacturing Parts: *John Morral*¹; Shuanglin Chen²; ¹Ohio State University; ²Computherm

Additive Manufacturing: Modeling and Simulation of AM Materials, Processes, and Mechanics — AM Modeling - Session IV

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

Wednesday AM
 October 17, 2018

Room: A223
 Location: Greater Columbus Convention Center

Session Chair: Jing Zhang, Indiana University - Purdue University Indianapolis

8:00 AM

Towards Studying Process-structure-property Relations by Developing Process-specific Defect-embedded Microstructure Models: *Saikumar Reddy Yeratapally*¹; Jacob Hochhalter²; Geoffrey Bomarito²; ¹National Institute Of Aerospace; ²NASA Langley Research Center

8:20 AM

Characterization of Downward Facing Surface Roughness Impacting Performance in Additive Manufacturing: *Eric-Paul Tatman*¹; Joy Gockel¹; ¹Wright State University

8:40 AM

Prediction of Mechanical Behavior of Lattice Structures Using Experimentally Driven Finite Element Modeling: *Behzad Bahramibabamiri*¹; *Hesam Askari*²; Kavan Hazeli¹; ¹University of Alabama in Huntsville; ²University of Rochester

9:00 AM

Uncertainty Quantification in Solidification Modeling of Additive Manufacturing: *Supriyo Ghosh*¹; E. Chin²; J. Knap²; D. Allaire¹; A. Elwany¹; R. Arroyave¹; ¹Texas A&M University; ²U.S. Army Research Laboratory

9:20 AM

Physics-based Process-microstructure Modeling in Powder Bed Metal Additive Manufacturing: *Jingfu Liu*¹; Behrooz Jalalahmadi¹; ¹Sentient Science

9:40 AM

Microstructural Evolution Simulation for Property Prediction in Cold Spray Processing: *Danielle Cote*¹; Victor Champagne, Jr.²; ¹Worcester Polytechnic Institute; ²U.S. Army Research Laboratory

10:00 AM Break

10:20 AM

Modeling of Phase Transformation in the Production of Self-propagating High-temperature Synthesis of Wear-resistant Coatings: *Borys Sereda*¹; *Dmytro Sereda*¹; Irina Palehova¹; ¹DDTU

10:40 AM

Influence of Powder Size Distribution on Porosity and Surface Roughness in Powder Bed Fusion Additive Manufacturing: *Alexander Rausch*¹; Matthias Markl¹; Carolin Körner¹; ¹Chair of Materials Science and Engineering for Metals

Advanced Manufacturing, Processing, Characterization, and Modeling of Functional Materials — Shape Memory Alloys

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

Wednesday AM
 October 17, 2018

Room: B230
 Location: Greater Columbus Convention Center

Session Chairs: Mohammadreza Nematollahi, University of Toledo; C. Virgil Solomon, Youngstown State University; Mohammad Mahtabi, University of Tennessee at Chattanooga; Othmane Benafan, NASA Glenn Research Center

8:00 AM Invited

The Effect of Re-melting on the Surface Condition of the Additively Manufactured NiTi Parts: *Ahmadreza Jahadakbar*¹; Amir Dehghan¹; Mohammadreza Nematollahi¹; Parisa Bayatimalayeri¹; Mohammad Mahtabi¹; Hamdy Ibrahim¹; Mohammad Elahinia¹; ¹University of Toledo

8:40 AM

Investigation of the Mechanical Properties of NiMnGa Magnetic Shape Memory Alloys Using Nanoindentation Techniques: *Yash Trivedi*¹; Matthew Caputo¹; Jae Joong Ryu¹; C. Virgil Solomon¹; ¹Youngstown State University

9:00 AM

Impact of Building Orientation and Scanning Strategy on the Tensile Properties of SLM Fabricated Ni-rich NiTi: *Sayed Ehsan Saghalian*¹; Narges Shayesteh Moghaddam²; Peizhen Li¹; Guher Toker¹; Mohammadreza Nematollahi²; Mohammad Elahinia¹; Haluk E. Karaca¹; ¹University of Kentucky; ²University of Toledo

9:20 AM

Modeling of Additively Manufactured Shape Memory Alloys: *Natalie Zeleznik*¹; Alejandro Hinojos¹; Narges Moghaddam²; Soheil Saedi³; Haluk Karaca³; Mohammad Elahinia²; Michael Mills¹; Peter Anderson¹; ¹Ohio State University; ²University of Toledo; ³University of Kentucky

WEDNESDAY AM

9:40 AM

Enhancing the Surface Quality of Additively Manufactured NiTi by Electropolishing: *Amir Dehghanhadikolaei*¹; Hamdy Ibrahim¹; Mohammad Mahtabi¹; Ahmadreza Jahadkbar¹; Mohammadreza Nematollahi¹; Parisa Bayatimalayeri¹; Mohammad Elahinia¹; ¹The University of Toledo

10:00 AM Break

10:20 AM

Sintering of Binder jet 3D Printed Ni-Mn-Ga Alloys: An Overview of Sintering Conditions and Microstructural Effects: *Matt Caputo*¹; C. Virgil Solomon¹; ¹Younstown State University

10:40 AM

The Effect of Process Parameters on the Properties of Selective Laser Melted NiTiHf Alloys: *Guher Toker*¹; Mohammadreza Nematollahi²; Ehsan Saghaian¹; Mohammad Elahinia²; Othmane Benafan³; Haluk Karaca¹; ¹University of Kentucky; ²University of Toledo; ³NASA Glenn Research Center

11:00 AM

The Effects of Size and Geometry on the Microstructure and Transformation Temperatures of Additively Manufactured NiTi: *Nazanin Farjam*¹; Mohammad Mahtabi¹; Mohammad Reza Nematollahi¹; Mohammad Elahinia¹; ¹The University of Toledo

11:20 AM

Thermomechanical Characterization of SLM manufactured Porous Structured NiTi Devices: *Ankur Majumdar*¹; Sayed Saghaian¹; Amirhesam Amerinatanzi²; Narges Moghaddam²; Mohammadreza Nematollahi²; Guher Toker¹; Mohammad Elahinia²; Haluk Karaca¹; ¹University of Kentucky; ²University of Toledo

11:40 AM

Welding of High Temperature Shape Memory Alloys: A Feasibility Study: *Kaleb Ponder*¹; Antonio Ramirez¹; Othmane Benafan²; Joao Oliveira³; ¹Ohio State University; ²NASA; ³UNIDEMI

Advanced Steel Metallurgy: Products and Processing — Stainless and High Alloy Steels and Cast Iron

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

Wednesday AM

October 17, 2018

Room: A226

Location: Greater Columbus Convention Center

Session Chair: Mingzhi Xu, Georgia Southern University; Konstantin Redkin, WHEMCO Inc

8:00 AM Invited

The Effect of Cooling Condition on the δ -to- γ Transformation in Selected Ferritic Stainless Steels: *Suk-Chun Moon*¹; Jong-Chul Kim²; Seong-Yeon Kim²; Rian Dippenaar¹; ¹University of Wollongong; ²POSCO

8:20 AM

Effect of Starting As-cast Structure on the Microstructure-texture Evolution during Subsequent Processing and Finally Ridging Behavior of Ferritic Stainless Steel (FSS): *Pranabananda Modak*¹; Sudipta Patra¹; Rahul Mitra¹; Debalay Chakrabarti¹; ¹Indian Institute of Technology Kharagpur

8:40 AM

Tempering Machine Design and Construction for PC Strand Production Process: *Yilmaz Yildirim*¹; Mustafa Ozmen¹; ¹Guney Celik R&D Center

9:00 AM

Comparison of the Mechanical Properties of Different Quality Austenitic Stainless Steels after Wire Drawing: *Yilmaz Yildirim*¹; ¹Guney Celik, R&D Center

9:20 AM

Influence of Cooling Rate Immediately before Hot Working on Flow Stress of Duplex Stainless Steel: *Shunsuke Sasaki*¹; Tatsuro Katsumura¹; Hiroki Ota¹; Jun Yanagimoto²; ¹JFE Steel Corporation; ²The University of Tokyo

9:40 AM

Microstructure and Mechanical Behavior of a TWIP Steel under Quasi-static and Dynamic Loading: *Xiaoxue Chen*¹; Jianguo Li²; Laszlo Kecskes³; Vincent Hammond³; Qiuming Wei⁴; ¹University of North Carolina Charlotte; ²Northwestern Polytechnical University; ³US Army Research Laboratory; ⁴UNCC

10:00 AM Break

10:20 AM

Deformation Behavior and Mechanism of Ultrahigh-strength Cobalt-free 19Ni3Mo1.5Ti Maraging Steel in Tensile Deformation: *Kun Li*¹; B. Yu²; R.D.K. Misra²; ¹University of Texas El Paso; ²UTEP

10:40 AM

Analysis of Mg Yield of Ductile Cast Iron by Neural Network: *Takeaki Kobayashi*¹; Kazuki Akiyama²; Toshitake Kanno²; Nozomu Uchida¹; ¹Nagaoka University of Technology; ²Kimura Chuzosho Co., Ltd. Research & Development Dep.

11:00 AM

Developing a Graphitic White Cast Iron: *Jie Wan*¹; Jingjing Qing¹; Mingzhi Xu¹; ¹MST

11:20 AM

Carbide Precipitation in Thin Wall Ductile Iron Cast in Silica Sand / Rice Husk Ash Mould: *Fidelia Ochulor*¹; Samson Adeosun¹; ¹University of Lagos

11:40 AM

Magnetic Barkhausen Noise (MBN) Analysis of Unknown Pipeline Steels: *Clodualdo Aranas*¹; Youliang He¹; Maciej Podlesny¹; Muhammad Ariffin¹; ¹CanmetMATERIALS, Natural Resources Canada

Advances in Solid Oxide Fuel Cell Technology — SOFC Durability

Program Organizers: Scott Swartz, Nexceris LLC; Matthew Seabaugh, Nexceris LLC; Jeff Stevenson, Pacific Northwest National Laboratory

Wednesday AM

October 17, 2018

Room: D281

Location: Greater Columbus Convention Center

Session Chairs: Matthew Seabaugh, Nexceris LLC; Neil Kidner, Nexceris LLC

8:00 AM

Evidence of Space Charge Layer Evolution at YSZ Grain Boundaries in Solid Oxide Fuel Cell Anodes Operated Using Humidified Hydrogen: Yun Chen¹; Harry Abernathy²; Gregory Hackett³; *Xueyan Song*¹; Kirk Gerdes³; ¹West Virginia University; ²US Department of Energy/AECOM; ³US Department of Energy

8:20 AM

Large-scale, High-performance Computation of Local Electrochemistry in Heterogeneous Solid Oxide Fuel Cell Microstructures: *Yu-Ting Hsu*¹; William Epting¹; Rubayyat Mahub¹; Harry Abernathy¹; Gregory Hackett¹; Anthony Rollett²; Shawn Litster²; Paul Salvador¹; ¹U.S. DOE National Energy Technology Laboratory; ²Carnegie Mellon University

8:40 AM

Improvement in Lifetime of SOFCs, Utilizing Novel, In-situ Methods to Remove Cathodic Chromium Deposits: Michelle Sugimoto¹; Zhikuan Zhu¹; *Uday Pal*¹; Soumendra Basu¹; Srikanth Gopalan¹; ¹Boston University



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

9:00 AM

Nanostructure Degradation at LSM/YSZ and YSZ/YSZ Grain Boundaries in Solid Oxide Fuel Cell Cathodes Operated in Humidified Air: Yun Chen¹; Yueying Fan²; Shiwoo Lee²; Gregory Hackett³; Harry Abernathy²; *Xueyan Song*¹; Kirk Gerdes³; ¹West Virginia Univ; ²US Department of Energy/AECOM; ³US Department of Energy

9:20 AM

Towards an Understanding of Zero Degradation in a High-performance SOFC: *Xiao-Dong Zhou*¹; Emir Dogdibegovic²; Yudong Wang¹; ¹University of Louisiana at Lafayette; ²University of South Carolina

9:40 AM

Study of La_{1-x}Sr_xCo_{0.2}Fe_{0.8} as Cr Gettering Materials for Solid Oxide Fuel Cells: *Yeong-Shyung Chou*¹; Jung-Pyung Choi¹; Nathan Canfield¹; Jeffrey Stevenson¹; ¹PNNL

10:00 AM Break

10:20 AM

Impacts of Accelerated Vapor Phase Nickel Transport within Ni-YSZ Cermet Anodes: *Paul Gasper*¹; Yanchen Lu¹; Soumendra Basu¹; Srikanth Gopalan¹; Uday Pal¹; ¹Boston University

10:40 AM

Novel LSCo-Mullite Composite Cathode Contact Material for Solid Oxide Fuel Cells: *Yeong-Shyung Chou*¹; Nathan Canfield¹; Jeff Bonnett¹; Jeffrey Stevenson¹; ¹PNNL

11:00 AM

Effects of Manganese Excess on the Microstructure and Performance of LSM-Based SOFC Cathodes Operated under Aggressive Conditions: *Andrew Cai*¹; Chenxin Deng¹; Naima Hilli¹; Mark De Guire¹; Arthur Heuer¹; ¹Case Western Reserve University

11:20 AM

Evaluation of Spinel-based Contact Layer Synthesized with Alloy Powder Precursors for SOFC Cathode-side Contact Application: *Jiahong Zhu*¹; Yutian Yu¹; ¹Tennessee Tech University

11:40 AM

Improving Ni-YSZ Cermet Anode Performance by Liquid Infiltration of Nickel Catalyst Particles with LSCM: *Yanchen Lu*¹; Paul Gasper¹; Boshan Mo¹; Srikanth Gopalan¹; Uday Pal¹; Soumendra Basu¹; ¹Boston University

Advances in Surface Engineering — Carburization/Nitridation/Boronization and Engineering of Surface Geometry/Structure/Roughness

Program Organizers: Brian Skinn, Faraday Technology, Inc.; Timothy Hall, Faraday Technology, Inc.; Sandip Harimkar, Oklahoma State University; Michael Roach, University of Mississippi Medical Center; Rajeev Gupta, The University of Akron

Wednesday AM
October 17, 2018

Room: B144/145
Location: Greater Columbus Convention Center

Session Chairs: Virendra Singh, Schlumberger; Brian Skinn, Faraday Technology, Inc.; Tim Hall, Faraday Technology, Inc.

8:00 AM

ToF-SIMS Studies of Surface Activation for Low-temperature Carburization or Nitridation: *Cyprian Illing*¹; Kevin Abbasi²; Frank Ernst¹; ¹Case Western Reserve University; ²Swagelok Center for Surface Analysis of Materials

8:40 AM

Surface Engineering of Co-Cr-based Alloys by Low-temperature Nitrocarburization: *Zhe Ren*¹; Steven Eppell¹; Clare Rimnac¹; Sunniva Collins¹; Frank Ernst¹; ¹Case Western Reserve University

9:00 AM

Boron-induced Surface Modification of Nickel-based Alloys: *Virendra Singh*¹; Tatiana Ayers¹; Manuel Marya¹; ¹Schlumberger

9:20 AM

Isolated Properties of AISI 316 Stainless Steel Infused with Concentrated Interstitial Carbon: *Zhe Ren*¹; Arthur Heuer¹; Frank Ernst¹; ¹Case Western Reserve University

9:40 AM

A Novel TiN Formation Method on the Ti-added Ferritic Stainless Steel: *JungHyun Kong*¹; SangSeok Kim¹; ¹POSCO/Stainless Steel Research Group

10:00 AM Break

10:20 AM

Electrofinishing of Passivating Biomedical Materials (like Nitinol, Ti, Ta, CoCr, and Mo) in HF-Free Low Viscosity Water Based Electrolytes: *Timothy Hall*¹; Holly Garich¹; EJ Taylor¹; Maria Inman¹; ¹Faraday Technology Inc

10:40 AM

Wetting Behavior of Al 2024 Alloy Surfaces after Spot-by-spot Laser-interference Processing: *Adrian Sabau*¹; Jianlin Li¹; Sheng Yangping¹; Harry Meyer¹; Jian Chen¹; ¹Oak Ridge National Laboratory

11:00 AM

Passive and Active Biomimetic Micro-patterned Surfaces and Actuators for Flow Manipulation and Aerodynamic Drag Reduction: *Allison Arnold*¹; Justin Schrouf¹; Kavin Sivaneri Varadharajan Idhaam¹; Zach Fahey¹; Kevin Tennant¹; Wade Huebsch¹; Patrick Browning¹; Edward Sabolsky¹; ¹West Virginia University

11:20 AM

Forming of Passive and Poorly-machinable Materials by Pulse-reverse Electrochemical Processing: *Brian Skinn*¹; Timothy Hall¹; Stephen Snyder¹; Maria Inman¹; E Jennings Taylor¹; ¹Faraday Technology, Inc.

Art and Cultural Heritage: Reverse Engineering — Art and Cultural Heritage: Reverse Engineering I

Program Organizers: Glenn Gates, Walters Art Museum; John McCloy, Washington State University

Wednesday AM
October 17, 2018

Room: B232
Location: Greater Columbus Convention Center

Session Chairs: Jamie Weaver, NIST; Marie Jackson, University of Utah

8:00 AM Invited

Conservation of Historical Coin from 1853 Rescued in the Fortin Villa 25 de Mayo-Mendoza: *Patricia Carrizo*¹; ¹Universidad Tecnológica Nacional Regional Mendoza(UTNFRM)

8:20 AM

Degradation Makers of Cellulose Acetate during Aging: *Liu Liu*¹; Lukasz Bratasz²; ¹Northwestern Polytechnical University; ²Yale Institute for the Preservation of Cultural Heritage

8:40 AM

Natural fibers from the Colombian Amazonia as Cultural Materials: *Henry Colorado*¹; ¹Universidad De Antioquia

WEDNESDAY AM

9:00 AM Invited

Archeometallurgy, Heritage and Preservation of Iron Bridge over Mendoza River: *Patricia Carrizo*¹; ¹Universidad Tecnológica Nacional Regional Mendoza(UTNFRM)

9:20 AM

Moisture Expansion of Porcelain: *William Carty*¹; Duncan Martin¹; ¹Alfred University

9:40 AM Keynote

Numbered Jun Ware: Colors and Origins: *Lucy Cooper*¹; Katherine Eremin¹; Susan Costello¹; Jules Gardener²; Stephan Kraemer²; Marc Walton³; Emeline Pouyet³; Laure Dussubieux⁴; Andrew Shortland⁵; ¹Harvard Art Museums; ²Harvard Center for Nanoscale Systems; ³Northwestern University Art Institute of Chicago Center for Scientific Studies in the Arts; ⁴Field Museum; ⁵Cranfield Forensic Institute

10:20 AM Break**10:40 AM Invited**

Viscous Flow of Medieval Cathedral Glass: *John Mauro*¹; Ozgur Gulbilen²; Xiaoju Guo²; Olus Boratav²; ¹The Pennsylvania State University; ²Corning Incorporated

11:20 AM

The Lost Craftsmanship of the Cheapside Hoard: *Ann-Marie Carey*¹; Keith Adcock¹; ¹School of Jewellery

Bulk Metallic Glass Matrix Composites - Challenges and Triumphs — Alloy Design and Theoretical Modeling

Program Organizers: Muhammad Rafique, RMIT University; Weidong Li, The University of Tennessee; Junwei Qiao, Taiyuan University of Technology; Gang Wang, Shanghai University

Wednesday AM
October 17, 2018

Room: B244/245
Location: Greater Columbus Convention Center

Session Chairs: Takeshi Egami, The University of Tennessee; Jan Schroers, Yale University

8:00 AM Invited

Structure and Dynamics of BMG Forming Liquid: *Takeshi Egami*¹; ¹University of Tennessee

8:30 AM

Slip Statistics for a Bulk Metallic Glass Composite Reflect Its Ductility: *Wendelin Wright*¹; Alan Long²; Xiaojun Gu¹; Xin Liu²; Todd Hufnagel³; Karin Dahmen²; ¹Bucknell University; ²University of Illinois at Urbana Champaign; ³Johns Hopkins University

8:50 AM Invited

Iron-based Bulk Metallic Glass Larger than the Critical Casting Thickness Fabricated via Laser-based Additive Manufacturing: *Ola Harrysson*¹; Zaynab Mahbooba¹; Lena Thorsson²; Mattias Onosson²; Peter Skoglund²; ¹Sindre Metals; North Carolina State University; ²Sindre Metals

9:10 AM Invited

Confinement of Helium Precipitates Growth within Metal Nanolayers and Implications to Helium Irradiation Damage in Fusion: *Yongqiang Wang*¹; Di Chen¹; Nan Li¹; Dina Yuryev²; K. Baldwin¹; Michael Demkowicz²; ¹Los Alamos National Laboratory; ²Massachusetts Institute of Technology; ³Texas A&M University

9:30 AM Invited

Rare Events and Uncertainty Quantification in Crystal and Amorphous Plasticity: *Stefanos Papanikolaou*¹; ¹West Virginia University

9:50 AM

Panorama of Patent Activity in Amorphous Metallic Glasses: Alloys, Usages and Assignees: Douglas Milanez¹; *Braulio Oliveira*¹; Daniel Leiva¹; Walter Botta¹; Claudio Kiminami¹; ¹Federal University of São Carlos

10:10 AM Break**10:30 AM Invited**

Shear Banding in Bulk Metallic Glass Matrix Composites with Dendrite Reinforcements: *Stephen Niezgoda*¹; Michael Gibbons¹; Wolfgang Windl¹; Katharine Flores²; ¹The Ohio State University; ²Washington University in St. Louis

10:50 AM

High Throughput Design of Mg-based Metallic Glasses: *Janine Erickson*¹; John Perepezko¹; Dan Thoma¹; ¹University of Wisconsin Madison

11:10 AM

Mechanical Properties and Atomic Bonding Character in Metallic Glasses: *Tanguy Rouxel*¹; ¹University of Rennes 1

Ceramics and Glasses Simulations and Informatics — Machine Learning and Materials Design

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; Efrain Hernandez-Rivera, U.S. Army Research Laboratory

Wednesday AM
October 17, 2018

Room: A113
Location: Greater Columbus Convention Center

Session Chairs: Peter Kroll, University of Texas at Arlington; Ye Cao, University of Texas at Arlington

8:00 AM Keynote

Informatics Driven Discovery of Chemical Signatures for Designing Complex Oxides: *Krishna Rajan*¹; ¹University At Buffalo- State University of New York

8:40 AM Invited

Grand Challenges for Machine Learning in Glass Science: *John Mauro*¹; ¹The Pennsylvania State University

9:10 AM

Development of Empirical Force-fields for Glass Simulations Using Machine Learning: *Mathieu Bauchy*¹; ¹University of California, Los Angeles

9:30 AM

Optimizing Elastic Moduli of the Silicate Glasses through High-throughput Atomistic Modeling and Machine Learning Techniques: *Yong-Jie Hu*¹; Ge Zhao²; Tyler Del Rose¹; Liang Qi¹; ¹University of Michigan; ²The Pennsylvania State University

9:50 AM

Parametric Sensitivity and Exploratory Data Analysis of the ReaxFF Potential as Applied to Boron Carbide: *Efrain Hernandez-Rivera*¹; Souma Chowdhury²; Shawn Coleman¹; Payam Ghassemi²; Mark Tschoopp¹; ¹US ARL; ²University at Buffalo

10:10 AM Break**10:30 AM Keynote**

Machine Learning in Materials Science: Recent Progress and Critical Next Steps: *Rampi Ramprasad*¹; ¹Georgia Institute of Technology



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

11:10 AM Invited

Atomistic Computer Simulations and Design of Lithium Ion Solid State Electrolytes: *Jincheng Du*¹; ¹University of North Texas

Characterization & Methods in Failure Analysis — Fatigue & Fracture II

Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

Wednesday AM
October 17, 2018

Room: A211
Location: Greater Columbus Convention Center

Session Chairs: Guiru Liu, Progress Rail; Nicholas Cherolis, Baker Risk; Wesley Pridemore, General Electric-Aviation; Pierre Dupont, Schaeffler Belgium Sprl/bvba; Conrad Park, Case Western Reserve University

8:00 AM Invited

Failure Analysis of Rolling Elements and Plain Bearings : Methodologies for Its Systematic Approach: *Pierre Dupont*¹; ¹Schaeffler Belgium Sprl/Bvba

8:20 AM

The Failure Analysis & Prevention of a Large and Critical Extrusion Gearbox Part 1/2 : The Case Study an Internationbal FAS Network Analysis: *Pierre Dupont*¹; Donato Firrao²; Véronique Vitry³; Fabienne Delaunois³; ¹Schaeffler Belgium Sprl/Bvba; ²Politecnico di TORINO, Italy; ³UMONS - Faculté polytechnique de MONS (FPMs)

8:40 AM

The Failure Analysis & Prevention of a Large and Critical Extrusion Gearbox Part 2/2 : From Failure Analysis to Prevention, an International FAS Network Answer: *Pierre Dupont*¹; Donato Firrao²; Véronique Vitry³; Fabienne Delaunois³; ¹Schaeffler Belgium Sprl/Bvba; ²Politecnico di TORINO, Italy; ³UMONS - Faculté polytechnique de MONS (FPMs)

9:00 AM

On the Gear Failure Modes Prevention & Their Estimations in Industrial Designs: *Pierre Dupont*¹; ¹UMONS Faculté polytechnique de MONS (FPMs)

9:20 AM

Fatigue Behavior of 2124/25%SiCp/3µm Al Composites: *Ji Xia*¹; Conrad Park¹; Matthew Willard¹; John Lewandowski¹; Don Hashiguchi²; Kyung Chung³; ¹Case Western Reserve University; ²Materion Brush Incorporated ; ³Materion Brush Incorporated

9:40 AM

Electrical Arc Induced Fatigue Crack Initiation on Commercial Aircraft Engine Components: *Wesley Pridemore*¹; ¹GE Aviation

10:00 AM Break

10:20 AM

Fuel Nozzle Intergranular Cracking: *Robert Ware*¹; ¹AFRL/RXSA

10:40 AM

Metallurgical Evaluation of a Fractured Gas Turbine HPT Disk Post Tang: *William Rossey*¹; ¹General Electric Aviation

11:00 AM

Metallurgical Evaluation of Fractured Gas Turbine HPT Shroud C-clips and Associated Data Generated to Support Root Cause: *William Rossey*¹; ¹General Electric Aviation

Composition-Processing-Microstructure-Property Relationships of Titanium Alloys — Deformation, Fatigue, & Fracture

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

Wednesday AM
October 17, 2018

Room: C150
Location: Greater Columbus Convention Center

Session Chairs: Carl Boehlert, Michigan State University; Rongpei Shi, LLNL

8:00 AM Invited

Ambient Temperature Hydride Formation in Ti Alloys Investigated by In-situ SEM Hydrogen Permeation Tests: *Jinwoo Kim*¹; *C. Tasan*¹; ¹Massachusetts Institute of Technology

8:30 AM

Effects of Hydrogen on Fatigue and Dwell Fatigue Behavior of Near-alpha Titanium Alloys: *V. Sinha*¹; R.B. Schwarz²; M.J. Mills³; J.C. Williams³; ¹UES, Inc.; The Ohio State University; ²Los Alamos National Laboratory; ³The Ohio State University

8:50 AM

Titanium Oxidation in Low Oxygen Environment: *Mayela Aldaz-Cervantes*¹; Paul Rottmann¹; N.S. Harsha Gunda¹; Anton Van der Ven¹; Carlos Levi¹; ¹University of California, Santa Barbara

9:10 AM

Enhancing the Mechanical Properties of Fe and Al Modified Ti-Cr Alloys: *JoAnn Ballor*¹; Vahid Khademi¹; Harish Chakravarty¹; Masahiko Ikeda²; Carl Boehlert¹; ¹Michigan State University; ²Kansai University

9:30 AM

β Phase Stability Control in a Near-α TRIP Titanium Alloy: *Fan Meng*¹; Gregory Olson¹; ¹Northwestern University

9:50 AM

Mechanisms of Dwell Fatigue Fracture in Ti-6Al-4V: *V. Sinha*¹; W.J. Porter²; S.K. Jha³; A.L. Pilchak⁴; ¹Air Force Research Laboratory/UES, Inc.; ²Air Force Research Laboratory/University of Dayton Research Institute; ³University of Dayton Research Institute; ⁴Air Force Research Laboratory

10:10 AM Break

10:30 AM

Structure-property Relationships for Fatigue of Bimodal Duplex Ti-6Al-4V: *Adrienne Muth*¹; Reji John²; Adam Pilchak²; Surya Kalidindi¹; David McDowell²; ¹Georgia Institute of Technology; ²Air Force Research Laboratory

10:50 AM

Mechanical Behaviour of Additively Manufactured (Repaired) Titanium Alloy: *Sulochana Shrestha*¹; Manigndan Kanan¹; Michael Presby¹; Gregory Morscher¹; Andrew L. Gyekenyesi¹; ¹University of Akron

11:10 AM

Computational Statistics of Formation and Cyclic Stress-strain Redistribution of Microstructurally Small Cracks in Alpha-Ti and Ti-6Al-4V: *Krzysztof Stopka*¹; David McDowell¹; ¹Georgia Institute of Technology

11:30 AM Invited

High Superelasticity in Compression Observed in the Biomedical Ti-Nb-Ta-Zr Alloys: *Kudakwashe Nyamuchiwa*¹; *Mohamed Gepreel*¹; ¹Egypt-Japan University of Science and Technology

WEDNESDAY AM

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Session III

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

Wednesday AM
October 17, 2018

Room: D180
Location: Greater Columbus Convention Center

Funding Support provided by: MilliporeSigma

Session Chairs: Edward Gorzkowski, Naval Research Laboratory; Haitao Zhang, UNC Charlotte

8:00 AM

Effects of Precursors on Preparation of SiOC Bulk Ceramics: *Kathy Lu*¹; Lixia Wang¹; ¹Virginia Tech

8:20 AM Invited

Single-source-precursor Synthesis of Si-based Ceramic Nanocomposites for Environmental Applications: *Zhaoju Yu*¹; ¹Xiamen Univeristy

8:50 AM

Programming Nanoparticle Assembly for Silica-based Ionogels: *Ruel McKenzie*¹; Sainath Jadhav¹; Marisa Tukpah¹; Daria Lazarenko¹; ¹The University of Akron

9:10 AM

Influence of Bond Characteristics of Polymer Precursors on the Pore Structure of Polymer Derived Ceramics: *Kathy Lu*¹; Donald Erb¹; ¹Virginia Tech

9:30 AM Invited

Synthesis and Functionality of Lead Halide Perovskites Studied by Time-resolved Laser Spectroscopy: *Clemens Burda*¹; ¹Case Western Reserve University

10:00 AM

Solution Combustion Synthesis of Nanosized Ferroelectric (1-x)KNbO₃-x(BaNb_{1/2}Ni_{1/2}O₃): Characterization, Mechanism and Photocatalytic Properties: *Ranabrata Mazumder*¹; S. Abhinay¹; ¹National Institute of Technology Rourkela

10:20 AM Break**10:40 AM**

Synthesis of Silicon Nano Particles from Cassava Periderm by Reduction Method: *Suleiman Hassan*¹; Johnson Agunsoye¹; Joseph Agboola¹; Adebisi Jeleel²; Sefiu Bello³; ¹University of Lagos, Nigeria; ²University of Ilorin, Nigeria; ³Kwara State University, Maleta

11:00 AM

Fabrication of 3D Phononic Crystals Using Polystyrene Spheres and Nano-Si Particles: *Shan-Ju Chiang*¹; Leon Shaw¹; ¹Illinois Institute of Technology

11:20 AM

Synthesis of Nanostructured Li₇La₃Zr₂O₁₂ Solid Electrolyte Powders in Molten Salt Eutectics: Jon Weller¹; Justin Whetten¹; Candace Chan¹; ¹Arizona State University

Corrosion of Additively Manufactured Metals — Corrosion of Additively Manufactured Metals

Program Organizers: Eric Schindelholz, Sandia National Laboratories; Rajeev Gupta, The University of Akron; Ajit Mishra, Haynes International

Wednesday AM
October 17, 2018

Room: A220
Location: Greater Columbus Convention Center

Session Chairs: Eric Schindelholz, Sandia National Laboratories; Rajeev Gupta, The University of Akron; Ajit Mishra, Haynes International

8:00 AM Invited

Corrosion of Additively Manufactured Metallic Materials: *Pin Lu*¹; Dana Frankel¹; Thomas Kozmel¹; Chris Kantner¹; James Saal¹; ¹QuesTek Innovations

8:20 AM

Corrosion Characteristics of Additively Manufactured Stainless Steel: *Jamie Stull*¹; Mary Ann Hill¹; Daniel Hooks¹; Thomas Lienert¹; Justin Tokash²; Kevin Bohn¹; ¹Los Alamos National Lab; ²Oak Ridge National Laboratory

8:40 AM

Accelerated Sensitization in Laser Additively Manufactured 316L: *Duane Armell Macatangay*¹; ¹University of Virginia

9:00 AM

Correlating the Microstructure and Surface Morphology of Laser Engineered Net Shape (LENS) 304L Series Stainless Steel to Its Corrosion Response: *Michael Melia*¹; Rebecca Schaller²; Hai-Duy Nguyen¹; Jason Taylor¹; Jeffrey Rodelas¹; Eric Schindelholz¹; ¹Sandia National Laboratory; ²University of British Columbia

9:20 AM Invited

On the Corrosion Characteristics of 316L Manufactured by Selective Laser Melting: *Sebastian Thomas*¹; Guilherme Sander¹; Victor Cruz¹; Cristian Costa¹; Derui Jiang¹; Xiang Gao¹; Wenwen Sun¹; Michael Brameld²; Christopher Hutchinson¹; Nick Birbilis¹; ¹Monash University; ²Woodside Energy

9:40 AM Invited

Effect of Immersion Time on Electrochemical Characteristics of Additively Manufactured 316L Stainless Steel Exposed to Artificial Seawater: *Barbara Shaw*¹; Elizabeth Sikora¹; Dailin Wang¹; ¹Pennsylvania State University

10:00 AM Break**10:20 AM**

Environmental Degradation of Stainless Alloys Made by Additive Manufacturing: Xiaoyuan Lou¹; Miao Song²; *Raul Rebak*³; ¹Auburn University; ²University of Michigan; ³GE Global Research

10:40 AM

Hydrogen Uptake and Diffusivity in Additively Manufactured Stainless Steels: *Rebecca Schaller*¹; Jason Taylor²; Jeffrey Rodelas²; Eric Schindelholz²; ¹University of British Columbia; ²Sandia National Laboratories

11:00 AM

Hydrogen Embrittlement of Additively Manufactured Inconel 718 in Seawater: *Liu Cao*¹; Ramgopal Thodla¹; ¹DNV GL

11:20 AM

High Temperature Oxidation Behavior of Additively Manufactured Alloys: *Sedigheh Rashidi*¹; Amit Pandey²; Rajeev Kumar Gupta¹; ¹University of Akron; ²Rolls Royce LG Fuel Cell Systems Inc.



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

Covetic Nanomaterials for Energy Applications — Covetic Materials I

Program Organizers: David Forrest, US Department of Energy;
Uthamalingam Balachandran, Argonne National Laboratory

Wednesday AM
October 17, 2018

Room: D282
Location: Greater Columbus Convention
Center

Session Chair: U (Balu) Balachandran, Argonne National Laboratory

8:20 AM Invited

Covetic Nanomaterials 101: *David Forrest*¹; ¹US Department of Energy

9:00 AM Invited

Melt Processing of Covetic Materials for Energy Applications: *Paul Jablonski*¹; Martin Detrois²; David Alman¹; U. Balachandran³; David Forrest⁴; ¹DOE/NETL; ²NETL and AECOM; ³ANL; ⁴DOE

9:40 AM

Mechanism Studies and Fabrication of Carbon Nanostructures Incorporated into Al Alloys by Electrocharging Assisted Process: *Xiaoxiao Ge*¹; Christopher Klingshirn¹; Manfred Wuttig¹; Karen Gaskell¹; Peter.Y Zavalij¹; Balu Balachandran²; Daniel, P Cole³; Lourdes Salamanca-Riba⁴; ¹University of Maryland; ²Argonne National Laboratory; ³U.S Army Research Laboratory

10:00 AM Break

10:20 AM

Manufacture and Characterization of Aluminum Covetics: *Iwona Jasiuk*¹; Siyuan Pang¹; Ivan Shchelkanov¹; Mete Bakir¹; David Ruzic¹; ¹University of Illinois

10:40 AM

Characterization of Metal-carbon Interfaces in Covetic Materials: *Christopher Shumeyko*¹; Daniel Cole¹; Xiaoxiao Ge²; Lourdes Salamanca-Riba²; ¹US Army Research Lab; ²University of Maryland

11:00 AM

Conductive Carbon-metal Composite Materials by Covetic Process: *Shenja Zhang*¹; Cornelius Muojekwu¹; Harry Couch²; Michael Braydich²; ¹General Cable; ²GDC Industries

11:20 AM Invited

Networks of Graphene Nanoribbons and Nanosheets Formed in Metals by the Electrocharging Assisted Process: *Lourdes Salamanca-riba*¹; Xiaoxiao Ge¹; Manfred Wuttig¹; Daniel Cole²; Chritopher Shumeyko²; Karen Gaskell¹; Oded Rabin¹; Balu Balachandran³; ¹University of Maryland; ²Army Research Laboratory; ³Argonne National Laboratory

Deformation and Transitions at Grain Boundaries VI — Dislocation-Grain Boundary interactions

Program Organizers: Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Saryu Fensin, Los Alamos National Laboratory; Jian Luo, University of California San Diego; Douglas Spearot, University of Florida

Wednesday AM
October 17, 2018

Room: A123
Location: Greater Columbus Convention
Center

Session Chairs: Samuel Hemery, Institute Prime - ENSMA; Eric Homer, Brigham Young University

8:00 AM

Fatigue Crack Initiation at Grain Boundaries Due to Grain Boundary Resistance against Crack Transfer and Local Stresses: Philipp Weiler¹; Florian Schaefer¹; *Michael Marx*¹; ¹Saarland University

8:20 AM

Role of Slip Transfer in Heterogeneous Deformation between a Soft and a Hard Grain in Grade 1 Titanium: *Harsha Phukan*¹; Thomas Bieler¹; Chen Zhang¹; Ruqing Xu¹; Philip Eisenlohr¹; Martin Crimp¹; Carl Boehlert¹; ¹Michigan State University

8:40 AM

Phase Transformation Strengthening in Metastable fcc Materials: *Carlyn LaRosa*¹; Changning Niu¹; Jiashi Miao¹; Michael Mills¹; Maryam Ghazisaeidi¹; ¹The Ohio State University

9:00 AM Invited

Atomistic Survey of Grain Boundary-dislocation Interactions in FCC Nickel: Devin Adams¹; *Eric Homer*¹; David Fullwood¹; Robert Wagoner¹; ¹Brigham Young University

9:30 AM Invited

Slip Activity in Ti Alloys: Interactions with Grain Boundaries: *Samuel Hemery*¹; Cyril Lavogiez¹; Patrick Villechaise¹; ¹Institute Prime - ENSMA

10:00 AM Break

10:20 AM

Simulation of Slip Transfer in Tensile Deformed Bicrystals Using a Dislocation Density Based Crystal Plasticity Model: Sarra Haouala¹; *Thomas Bieler*²; Javier Seguardo³; Javier Llorca³; ¹IMDEA Materiales; ²Michigan State University; Polytechnic University of Madrid; ³IMDEA Materiales; Polytechnic University of Madrid

10:40 AM

TEM Characterization of Dislocations Generated by Nanoindentation around Grain Boundary with Fe-3% Si Bicrystals: *Seiichiro Ii*¹; Ya-Ling Chang¹; Toru Hara¹; Takahito Ohmura¹; ¹National Institute for Materials Science

11:00 AM

Exploring Grain Boundary Dependent Deformation Mechanisms in Nanocrystalline Materials Through In-situ TEM High Cycle Fatigue: *Christopher Barr*¹; Khalid Hattar¹; ¹Sandia National Laboratories

11:20 AM

An Atomistic Method of Predicting Thermodynamic Force for Deformation: *Mulaine Shih*¹; Michael Mills¹; Maryam Ghazisaeidi¹; Peter Anderson¹; ¹Ohio State University

WEDNESDAY AM

11:40 AM

Role of Hierarchical Martensitic Boundaries on Localized Deformation and Fracture of Lath Martensitic Steel under Impact Loading at Different Temperatures: *Arya Chatterjee*¹; Abhijit Ghosh²; Rahul Mitra¹; Debalay Chakrabarti¹; ¹Indian Institute of Technology Kharagpur; ²Indian Institute of Technology Indore

Eco-Friendly and Sustainable Ceramics — Innovative Binders and Cement Blends

Program Organizers: Enrico Bernardo, University of Padova; Henry Colorado, Universidad De Antioquia; Ivo Dlouhy, Institute of Physics of Materials, Academy of Sciences of the Czech Republic; Aldo Boccaccini, University of Erlangen-Nuremberg; Antonio Pedro Oliveira, Federal University of Santa Catarina; Isabella Lancellotti, Università di Modena e Reggio Emilia; Alexander Karamanov, Bulgarian Academy of Sciences Institute of Physical Chemistry “Rostislav Kaischew”; Vilma Ducman, Slovenian National Building and Civil Engineering Institute

Wednesday AM
October 17, 2018
Room: A114
Location: Greater Columbus Convention Center

Session Chairs: Enrico Bernardo, University of Padova; Henry Colorado, Universidad de Antioquia

8:00 AM Introductory Comments

8:10 AM Invited

Carbonate Ceramics for the Reduction of Global Carbon Footprint: *Richard Riman*¹; Daniel Kopp¹; ¹Rutgers University

8:50 AM

Phosphate Cements Made from Battery Waste: *Henry Colorado*¹; ¹Universidad De Antioquia

9:10 AM Invited

Fe-silicate Binders as an Alternative to Cement: a Comparison in Performance and Environmental Footprint: *Yiannis Pontikes*¹; ¹KU Leuven

9:40 AM

Waste Tire Rubber in Calcium Phosphate Cement Blends: *Carlos Revelo*¹; Henry Colorado¹; ¹Universidad De Antioquia

10:00 AM Break

10:20 AM Invited

Uncommon Aluminosilicates as Sustainable Precursors for Geopolymers: *Isabella Lancellotti*¹; Luisa Barbieri¹; Cristina Leonelli¹; ¹University of Modena and Reggio Emilia

10:50 AM

Inorganic Polymers from FeO_x-CaO-SiO₂ Slags: Influence of CaO on Reactivity and Strength Development: *Christina Siakati*¹; Arne Peys¹; Yiannis Pontikes¹; ¹KU Leuven

11:10 AM

Geopolymers to Inertize Chromium Liquid Waste from Inks for Digital Decoration of Ceramic Tiles: *Isabella Lancellotti*¹; Luisa Barbieri¹; Eugenio Caponetti²; Cristina Leonelli¹; ¹University of Modena and Reggio Emilia; ²University of Palermo

From Diversity to Inclusion — Session I

Program Organizers: Elvi Dalgaard, Pratt & Whitney Canada; Lynnette Madsen, Svedberg Science, Inc.

Wednesday AM
October 17, 2018
Room: B231
Location: Greater Columbus Convention Center

10:30 AM Keynote

Rising to the Challenge: Personal Reflections on My Leadership Journey: *Priti Wanjara*¹; ¹NRC Aerospace

11:00 AM Invited

Wells: How Gender Diversity Can Drive Innovation in the STEM Fields: *Mary Wells*¹; ¹University of Guelph

11:30 AM

Multi-layered Mentorship Approaches in Summer Engineering Programs: *Kimberly Cook-Chennault*¹; ¹Rutgers, the State University of New Jersey

Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology — Optical, Photonic, and Electronic Properties of Glasses/Glass Structure

Program Organizers: John Kieffer, University of Michigan; Liping Huang, Rensselaer Polytechnic Institute

Wednesday AM
October 17, 2018
Room: A115
Location: Greater Columbus Convention Center

Session Chair: To Be Announced

8:00 AM Invited

Optical Ceramic Materials in Solid State Lasers: Historical Evolution and Current Perspectives: *Yiquan Wu*¹; ¹Alfred University

8:30 AM Invited

Photo-induced Property Changes in Chalcogenide Glasses: *Pierre Lucas*¹; Amey Khanolkar²; Pierre Deymier¹; Nicholas Boechler³; William Warfel¹; Neil Jenkins¹; Lizhu Li¹; ¹University of Arizona; ²University of Washington; ³UC San Diego

9:00 AM Invited

Thin Film Storage Phosphors for Medical Imaging: *Jacqueline Johnson*¹; Charles Bond²; Anthony Lubinsky³; Yu Jin¹; Amanda Petford-Long⁵; ¹University of Tennessee Space Institute; ²Utsi; ³SUNY Stony Brook; ⁴Northwestern University; ⁵Argonne National Laboratory

9:30 AM Invited

Science of Chalcogenide-based Conductive-bridging Random Access Memory: *Gang Chen*¹; Kirtankumar Dixit¹; Sunday Agbo¹; Mayur Sundararajan¹; ¹Ohio University

10:00 AM Break

10:20 AM Invited

Atomic Resolution Imaging of Structure and Dynamics in a 2D Silica Glass: *Pinshane Huang*¹; ¹University of Illinois, Urbana-Champaign

10:50 AM Invited

Nearly Defect-free Dynamical Models of Disordered Solids: The Case of Amorphous Silicon: *Parthapratim Biswas*¹; Dil Limbu¹; Raymond Atta-Fynn²; ¹The University of Southern Mississippi; ²The University of Texas at Arlington



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

11:20 AM

In-situ Raman Spectroscopy of the Indentation-induced Deformation of Glasses: *Yvonne Gerbig*¹; Chris Michaels¹; ¹National Institute of Standards and Technology

IMS Symposium on Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties — Optical and Electron Characterization of Microstructures

Program Organizers: Daniel Dennies, DMS, Inc.; James Martinez, NASA Johnson Space Center; Michael Keeble, Buehler, A Division of ITW; Jaret Frafjord, IMR Test Labs - Portland

Wednesday AM
October 17, 2018

Room: A212
Location: Greater Columbus Convention Center

Session Chairs: James Martinez, NASA Johnson Space Center; Mary O'Brien, Colorado School of Mines; Eric Cole, Carpenter Technology Corp

8:00 AM Invited

Quantifying Microstructural Morphologies through Automated Image Analysis of Optical and Electron Micrographs: Matthew Hecht¹; Anna Weiss¹; Txai Sibley¹; Brian DeCost¹; Elizabeth Holm¹; Bryan Webler¹; *Yosuf Picard*¹; ¹Carnegie Mellon University

8:20 AM Invited

Process-microstructure-property Relationships in Fe-Co-2V: *Donald Susan*¹; Andrew Kustas¹; Zahra Ghanbari¹; Jeff Rodelas¹; Joseph Michael¹; ¹Sandia National Lab

8:40 AM

Development of Transfer Functions for Estimating 3D Particle Distributions from 2D Cross Sections via Computational Modeling: *A. Gerlt*¹; A. Criner²; S. Semiatin²; E. Payton²; ¹Air Force Research Lab Materials and Manufacturing Directorate UES, Inc.; ²Air Force Research Lab Materials and Manufacturing Directorate

9:00 AM Invited

Analysis of Defects in Tungsten Heavy Alloy: *Zahra Ghanbari*¹; Donald Susan¹; Alice Kilgo¹; Christina Profazi¹; ¹Sandia National Laboratories

9:20 AM

Extending Grain Mapping into the Third Dimension Using Lab-based Diffraction Contrast Tomography: *William Harris*¹; Hrishikesh Bale¹; Steve Kelly¹; Nicolas Gueninchault²; Jun Sun²; Erik Lauridsen²; ¹Carl Zeiss X-ray Microscopy Inc; ²Xnovo Technology ApS

9:40 AM Invited

Analysis of Defect Structures in Deformed Metals Using EBSD: *David Field*¹; ¹Washington State University

10:00 AM Break

10:20 AM

Bendability Study on High-strength Strip Steel with Bainitic-martensitic Structure: *Abhisek Mandal*¹; Debalay Chakrabarti¹; ¹IIT Kharagpur

10:40 AM

Mapping of Sigma Phase in Creep Tested Super304H Advanced Austenitic Steels: *Tapasvi Lolla*¹; John Siefert¹; Michael Gagliano¹; ¹EPRI

11:00 AM Invited

Effect of Microstructure on Hydrogen Induced Cracking in X52 and X70 Pipeline Steels: *Mary O'Brien*¹; Kip Findley¹; ¹Colorado School of Mines

11:20 AM

Numerical Modelling of Laser Metal Deposited Coatings on Ti-6Al-4V Alloy: *Olawale Fatoba*¹; Rezvan Gharehbaghi¹; Stephen Akinlabi¹; Esther Akinlabi¹; ¹University of Johannesburg

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

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

Wednesday AM
October 17, 2018

Room: A122
Location: Greater Columbus Convention Center

Session Chair: Lauren Hughes, University of California, Davis

8:00 AM Invited

Interpreting Faceted Grain Boundary Migration as an Optimal Transport Problem: Ian Chesser¹; Brandon Runnels²; *Elizabeth Holm*¹; ¹Carnegie Mellon University; ²University of Colorado Colorado Springs

8:30 AM Invited

Dynamic Simulation of Oxygen Transport through Oxide Films: Markus Tautschnig¹; Nicholas Harrison²; *Michael Finnis*²; ¹Max-Planck-Institut für Eisenforschung GmbH; ²Imperial College London

9:00 AM Invited

Disconnections and Grain Growth in SrTiO₃: *Hadas Sternlicht*¹; Wolfgang Rheinheimer²; Alex Mehlmann³; Avner Rothchild³; Michael Hoffmann⁴; Wayne Kaplan²; ¹School of Engineering, Brown University; ²School of Materials Engineering, Purdue University; ³Department of Materials Science and Engineering, Technion; ⁴Institute of Applied Materials, Karlsruhe Institute of Technology

9:30 AM Invited

Unravelling Complex Nanoscale Deformation Mechanisms and Interfacial-mediated Behavior In Nanocrystalline Materials through Atomistic Modeling: Ankit Gupta¹; Jacob Gruber¹; *Garritt Tucker*¹; ¹Colorado School of Mines

10:00 AM Break

10:20 AM

Is the Grain Growth Transition of Strontium Titanate a Space Charge Transition?: *Wolfgang Rheinheimer*¹; Jana Parras²; Roger de Souza²; Michael Hoffmann³; ¹Purdue University; ²RWTH Aachen University; ³Karlsruhe Institute of Technology

10:40 AM

Simulation of Grain Boundary Migration and Phase Transformation in Metals with Overdamped Langevin Dynamics: *Carolina Baruffi*¹; Alphonse Finel¹; Brigitte Baercoix²; Oguz Umut Salman²; Yann Le Bouar²; ¹ONERA; ²Université Paris 13

11:00 AM

Slip-induced Twinning in Titanium: *Mohammad Shahriar Hooshmand*¹; Maryam Ghazisaeidi¹; ¹Ohio State University

11:20 AM

Transition from Source- to Stress-controlled Plasticity in Nanotwinned Materials Below a Softening Temperature: *Seyedeh Mohadeseh Taheri Mousavi*¹; Guijin Zou²; Haofei Zhou²; Huajian Gao²; ¹MIT; ²Brown University

WEDNESDAY AM

International Symposium on Defects, Transport and Related Phenomena — Bulk and Grain Boundary Transport

Program Organizers: Tatsuya Kawada, Tohoku University; Manfred Martin, RWTH Aachen University; Sangtae Kim, University of California, Davis; William Chueh, Stanford University

Wednesday AM
October 17, 2018

Room: B242/243
Location: Greater Columbus Convention Center

Session Chairs: WooChul Jung, KAIST; Igor Lubomirsky, Weizmann Institute of Science

8:00 AM Invited

Linear Diffusion Model for Determination of the Height of the Potential Barrier at Grain Boundaries of Ion-conducting Oxides: Chih-Yuan Chang¹; Sergey Khodorov²; Igor Lubomirsky²; Sangtae Kim¹; ¹University of California, Davis; ²Weizmann Institute of Science

8:40 AM Invited

Application of Kelvin Probe Force Microscopy to Measure Room Temperature Transport Characteristics of Oxygen Ion Conductors: Kerstin Neuhaus¹; Hans-Dieter Wiemhöfer¹; ¹University of Münster

9:20 AM

Electron Localization Enhances Cation Diffusion in Doped Zirconia and Ceria: Yanhao Dong¹; I-Wei Chen²; ¹Massachusetts Institute of Technology; ²University of Pennsylvania

9:40 AM Invited

Diffusion of Cation Impurities through Ceria Grain Boundaries: WooChul Jung¹; NoWoo Kwak¹; ¹KAIST

10:20 AM Break

10:40 AM

Density Functional Theory Modeling of the Cation Diffusion in Bulk Zirconia and in $\text{La}_{1-x}\text{Sr}_x\text{MnO}_{3+\delta}$ ($x=0.0-0.25$) for Solid Oxide Fuel Cells: Yueh-Lin Lee¹; Yuhua Duan¹; Dane Morgan²; Dan Sorescu¹; Harry Abernathy¹; Gregory Hackett¹; ¹National Energy Technology Laboratory; ²University of Wisconsin-Madison

11:00 AM Invited

Grain Boundary Hydrogen Transports in Nanocrystalline Metal Nitride Thin Films: Yoshitaka Aoki¹; ¹Hokkaido University

Joining of Advanced and Specialty Materials (JASM XX) — Nano- and Micro-Joining

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

Wednesday AM
October 17, 2018

Room: C171
Location: Greater Columbus Convention Center

Session Chairs: Zhiyong Gu, University of Massachusetts Lowell; Anming Hu, University of Tennessee Knoxville; Tomokazu Sano, Osaka University; Peng Peng, Beihang University

8:00 AM Invited

Molecular Simulations of Transient Liquid Phase Bonding of Ni-based Superalloy with Ni Nanoparticles: Jiaqi Wang¹; Seungha Shin¹; Anming Hu¹; Jackson Wilt¹; ¹University of Tennessee

8:20 AM Invited

Chemically Induced Joining of Silver Nanomaterials for Flexible Electrodes: Peng Peng¹; ¹Beihang University

8:40 AM

Laser Nanojoining of Copper Nanowires: Anming Hu¹; Yangbao Deng¹; Yongchao Yu¹; Yanfeng Bai¹; ¹University of Tennessee Knoxville

9:00 AM

Site-selective Solder Deposition on Multi-segment Nanowires for Nanowire Joining: Edward Fratto¹; Jirui Wang¹; Hongwei Sun¹; Zhiyong Gu¹; ¹University of Massachusetts Lowell

9:20 AM Invited

Photonic Controlled Structuring and Joining of Graphene and Metal-nanostructures for Flexible Electronics: Ruozhou Li¹; Jing Yan¹; Ying Yu¹; Anming Hu²; ¹Nanjing University of Posts and Telecommunications; ²University of Tennessee - Knoxville

9:40 AM

Metal-to-Silicon Bonding Using Silver Oxide Reduction Reaction and Its Mechanism: Kota Inami¹; Tomoki Matsuda¹; Tomokazu Sano¹; Akio Hirose¹; ¹Osaka University

10:00 AM Break

10:20 AM

Fabrication and Performance of MnCoCuNiFe High Entropy Alloy Nanopastes for Brazing Inconel 718: Denzel Bridges¹; Samantha Lang¹; Suhong Zhang¹; Raymond Xu²; Anming Hu¹; ¹University of Tennessee; ²Rolls-Royce Corporation

10:40 AM

Nanosolder Additions to Solder Pastes and their Effect on IMC Formation and Growth on Cu Substrate: Evan Wernick¹; Zhiyong Gu¹; ¹University of Massachusetts Lowell

11:00 AM

Transient Liquid Phase Bonding of Inconel 718 Superalloy Using Ni Nanoparticle Based Filler: Suhong Zhang¹; Denzel Bridges¹; Zhili Feng²; Anming Hu¹; ¹University of Tennessee; ²Oak Ridge National Laboratory



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

Joining of Advanced and Specialty Materials (JASM XX) — Welding Processes

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

Wednesday AM
October 17, 2018

Room: C172
Location: Greater Columbus Convention Center

Session Chair: Vikas Patel, ArcelorMittal USA

8:00 AM

Effect of Electron Beam Weld Bead Geometry on the Mechanical Properties of Ti6Al4V Alloy: *Sandeep Thakare*

8:20 AM

Effects of Process Parameters and Interface Gap on Laser Welding Quality of Ti6Al4V Alloy: *Kyung-Min Hong¹; Yung Shin¹; ¹Purdue University*

8:40 AM

Three-dimensional Numerical Simulation of Keyhole Dynamics based on Calculation of Coupled Multiphase Transfer during Laser Welding for Aluminum: *Qiaofeng Zhou¹; Fumikazu Miyasaka¹; Hiroaki Mori¹; ¹Osaka University*

9:00 AM

Effects on Hardness and Cooling Rates of 3-D Printed 4047 Aluminum for Electromagnetic Focusing Plasma: Comparison of MIG and SLS: *Adam Pringle¹; Paul Sanders¹; Joshua Pearce¹; ¹Michigan Technological University*

9:20 AM

Effect of Mass Deposition on Fatigue Properties of Newly Developed Ultra-narrow Gap Multipass PC-GMA Weld for Thick Section: *Ramkishor Anant¹; P.K. Ghosh¹; ¹Indian Institute of Technology Roorkee*

9:40 AM

Modeling of Severe Plastic Deformation in Mash Seam Welding Using Improved Electro-thermo-mechanical Simulation: *Alexey Kuprienko¹; Wei Zhang¹; Bruce Krakauer²; Menachem Kimchi¹; ¹The Ohio State University; ²A. O. Smith*

10:00 AM Break

10:20 AM Invited

Microstructure Characterization and Evaluation of Mechanical Properties for Friction Welded EN-24 Alloy Steel: *Vijay Gaikwad¹; ¹Bharat Forge Ltd.*

10:40 AM

Modeling and Advanced Characterization of Nickel Base Alloys for Nuclear Propulsion Applications: *Allison Fraser¹; John DuPont¹; ¹Lehigh University*

Journal of the American Ceramic Society Awards Symposium — JACerS Awards Symposium Session I

Program Organizer: William Fahrenholtz, Missouri University of Science and Technology

Wednesday AM
October 17, 2018

Room: A125
Location: Greater Columbus Convention Center

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

8:00 AM Introductory Comments

8:20 AM Invited

Scaling Effects in Ferroelectrics: An Old Problem Surpassed by New Materials: *Jon Ihlefeld¹; ¹University of Virginia*

8:50 AM Invited

Defect Mechanisms in BaTiO₃-BiMO₃ Ceramics: *Nitish Kumar¹; Eric Patterson²; Till Frömling³; Edward Gorzkowski²; Peter Eschbach⁴; Ian Love⁴; Michael Müller⁵; Roger De Souza³; Julie Tucker⁴; Steven Reese⁴; David Cann⁴; ¹The University of New South Wales; ²US Naval Research Laboratory; ³Technische Universität Darmstadt; ⁴Oregon State University; ⁵RWTH Aachen*

9:20 AM Invited

Toward Tunable and Bright Deep-red Persistent Luminescence of Cr³⁺ in Garnets: *Jian Xu¹; Jumpei Ueda¹; Setsuhisa Tanabe¹; ¹Kyoto University*

9:50 AM Break

10:20 AM Invited

Cements in the 21st Century: Challenges, Perspectives, and Opportunities: *Joseph Biernacki¹; Jeffrey Bullard²; Gaurav Sant³; Kevin Brown⁴; Fredrik Glasser⁵; Scott Jones²; Tyler Ley⁶; Richard Livingston⁷; Luc Nicoleau⁸; Jan Olek⁹; Florence Sanchez⁴; Rouzbeh Shahsavari¹⁰; Paul Stutzman²; Konstantine Sobolev¹¹; Tracie Prater¹²; ¹Tennessee Technological University; ²NIST; ³UCLA; ⁴Vanderbilt University; ⁵University of Aberdeen; ⁶Oklahoma State University; ⁷University of Maryland; ⁸BASF; ⁹Purdue University; ¹⁰Rice University; ¹¹University of Wisconsin Milwaukee; ¹²NASA*

10:50 AM Invited

Rate Controls on Silicate Dissolution in Aqueous Environments: *Gaurav Sant¹; Mathieu Bauchy¹; ¹University of California Los Angeles*

11:20 AM Invited

Ceramic Waste Form Performance and Degradation: Mechanistic Understandings: *Jie Lian¹; ¹Rensselaer Polytechnic Institute*

WEDNESDAY AM

Light Metal Technology – Applications for the Transportation Industry — Modeling and Formability/ Magnesium Alloys

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

Wednesday AM
October 17, 2018

Room: B130
Location: Greater Columbus Convention Center

Session Chairs: Julie Levesque, Quebec Metallurgy Center; Keerti Kappagantula, Ohio University; Stefan Walzer, IFU Stuttgart

8:00 AM Keynote

Integrated Computational Materials Engineering (ICME) for Vehicle Lightweighting: *Kaan Inal*¹; ¹University of Waterloo

8:40 AM

Numerical Investigation of Significant Process Parameters in a Tempered Deep Drawing Process of Magnesium Sheet Metal: *Stefan Walzer*¹; Mathias Liewald¹; ¹IFU Stuttgart

9:00 AM

Unveiling Low Current Electroplasticity in Aluminum Alloys: *Clifton Bumgardner*¹; Brendan Croom¹; Ningning Song¹; Xiaodong Li¹; ¹University of Virginia

9:20 AM

Improving Formability of Magnesium Alloy Sheet at Room Temperature by Texture Control: *Se Jong Kim*¹; Jinwoo Lee¹; Young-Seon Lee¹; Daeyong Kim¹; ¹Korea Institute of Materials Science

9:40 AM

The Influence of Recrystallization Temperature on Textural Evolution during Grain Growth in Mg Alloy AZ31B: *Mathew Steiner*¹; Jishnu Bhattacharyya²; Sean Agnew²; ¹University of Cincinnati; ²University of Virginia

10:00 AM Break

10:20 AM

LPSO Containing Mg-Alloys for Automotive and Aerospace Applications: *Joshua Caris*¹; Nick Farkas¹; Andrew Sherman¹; ¹Terves, LLC.

10:40 AM

Lightweight Road Wheels Manufactured by High Temperature Shear Forming of Mg Alloys Sheets: *Yoon Oh*¹; Woo Jin Park¹; Ki Hyuk Kwon¹; ¹Research Institute of Science and Technology

11:00 AM

A Ceria Based Conversion Coating on Squeeze Cast Mg- 4wt. %Y Alloy for Improved Corrosion Resistance in 0.1 M NaCl Solution: *Meeta Kamde*¹; Yogendra Mahton¹; *Partha Saha*¹; ¹NIT Rourkela

11:20 AM

The Effect of Sn and Ca Addition on Mechanical Properties and Ignition Behavior of Magnesium Alloys Subjected to Direct Extrusion Process: *Yohan Go*¹; Jae Ok Choi²; Joung Sik Suh³; Su Mi Jo¹; Bong Sun You³; Young Min Kim³; ¹Korea University of Science and Technology; ²Kyungpook National University; ³Korea Institute of Materials Science

Manufacturing-Related Failures — Casting Failures

Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

Wednesday AM
October 17, 2018

Room: A210
Location: Greater Columbus Convention Center

Session Chairs: Aaron Slager, Bell Helicopter Textron; Charles White, IME Dept, Kettering University; Mark Hood, Hood Engineering; Erik Mueller, National Transportation Safety Board; Ryan Haase, Materials Evaluation And Engineering; Adam Boesenberg, Iowa State University

8:00 AM

A Brief History of Time: From Sand Castings to Investment Castings (Diverse Failures of Assorted Hydrostatic Transmission Components): *Jacob Auliff*¹; ¹Danfoss

8:20 AM Invited

Understanding Steel Casting Failures: *David Poweleit*¹; ¹SFSA

8:40 AM

Factor Effecting the Prevention of a Failure: *Charles White*¹; ¹Kettering University

9:00 AM Invited

Failure Analysis of Casting Failure in the Field: *Michael Gathogo*¹; ¹John Deere

9:20 AM Invited

Examination of Two Developmental Gearbox Castings for Aircraft that Cracked Due to Internal Stresses: *Aaron Slager*¹; ¹Bell

9:40 AM

Welding Complications Caused By Steel Casting Defects: Why Process Control and Product Quality Are Critical For Customers: *Alex Kinsey*¹; Joseph Lemberg¹; Myra Dyer¹; Eric Guyer¹; ¹Exponent

10:00 AM Break

10:20 AM

Cracking Failures of Copper Alloy Hot Rolled Plates: Phenomenological Approach and Root Cause Analysis: *George Pantazopoulos*¹; Athanasios Vazdirvanidis¹; Ioannis Contopoulos¹; ¹ELKEME - Hellenic Research Centre for Metals S.A.

10:40 AM

Pusher Furnace Ingot Chair Failure Analysis: *Ifeanyi Chukwu Nweke*¹; ¹Skyvalue Aluminium Limited



OCTOBER 14 – 18, 2018
 GREATER COLUMBUS CONVENTION CENTER
 COLUMBUS, OHIO, USA

Materials Degradation in CO₂ Environments — Session I

Program Organizers: Richard Oleksak, National Energy Technology Laboratory; Julie Tucker, Oregon State University; Matthew Walker, Sandia National Laboratories

Wednesday AM Room: C162A/162B
 October 17, 2018 Location: Greater Columbus Convention Center

Session Chairs: Julie Tucker, Oregon State University; Richard Oleksak, National Energy Technology Laboratory

8:30 AM Invited

Dynamic Corrosion Tests in CO₂ Rich Environment: *Xijia Lu*¹; Mike McGroddy¹; Brock Forrest¹; David Freed¹; Kay John²; Jason Laumb²; Joshua Stanislawski²; John Hurley²; ¹8 Rivers Capital, LLC; ²Energy & Environmental Research Center

9:00 AM

The Effect of Surface Finish during High-temperature Oxidation of Fe Alloys in CO₂: *Gordon Holcomb*¹; Richard Oleksak¹; Casey Carney¹; Ömer Dogan¹; ¹National Energy Technology Laboratory

9:20 AM

Investigating the Electrical Resistance (ER) Technique for In-situ Structural Alloy Corrosion Monitoring within Supercritical CO₂ Power Cycles: *Matthew Walker*¹; ¹Sandia National Laboratories

9:40 AM

Corrosion and Carburization Behavior of Fe- and Ni-base Alloys in S-CO₂ Environment at Two Temperatures: *Sung Hwan Kim*¹; Gokul Obulan Subramanian¹; Changheui Jang¹; ¹Korea Advanced Institute of Science & Technology

10:00 AM Break

10:20 AM Invited

The Effect of Pressure and Impurities on Oxidation in Supercritical CO₂: *Bruce Pint*¹; James Keiser¹; ¹Oak Ridge National Laboratory

10:50 AM

High-temperature Oxidation of Steels and Nickel Alloys in CO₂ Containing Impurities: *Richard Oleksak*¹; Joseph Tylczak¹; Gordon Holcomb¹; Ömer Dogan¹; ¹National Energy Technology Laboratory

11:10 AM

The Effect of CO₂ Pressure on Chromia Scale Microstructure at 750°C: *Kinga Unocic*¹; Bruce Pint¹; ¹Oak Ridge National Laboratory

Materials for Nuclear Applications and Extreme Environments — Processing and Behavior of Novel Fuels I

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

Wednesday AM Room: D183
 October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Jake Amoroso, Savannah River National Laboratory

8:00 AM

Optimising Processing of Thorium Dioxide-silicon Carbides Composite Pellets Using Spark Plasma Sintering: *Anil Prasad*¹; Linu Malakkal²; Lukas Bichler³; Jerzy Szpunar²; ¹University of British Columbia; ²University of Saskatchewan; ³UBC

8:20 AM Invited

Microstructure Evolution and Response Behavior of U3Si2 by Extensive Ion Beam Irradiation: Tiankai Yao¹; Bowen Gong¹; Lingfeng He²; Jason Harp²; Michael Tonks³; *Jie Lian*¹; ¹Rensselaer Polytechnic Institute; ²Idaho National Laboratory; ³University of Florida

9:00 AM

The High-temperature Deformation Behavior of Depleted Uranium + 10 wt% Molybdenum: *Cody Miller*¹; Rodney McCabe¹; Daniel Coughlin¹; David Dombrowski¹; ¹Los Alamos National Laboratory

9:20 AM Invited

New Insights Into the Fabrication and Properties of Enhanced UO₂ Fuel: *Sarah Finkeldei*¹; Jim Kiggans¹; Rodney Hunt¹; Kurt Terrani¹; ¹Oak Ridge National Laboratory

10:00 AM Break

10:20 AM

Uranium Nitride Corrosion and High-temperature Irradiation Resistant Thermocouples: *Lan Li*¹; Ember Sikorski¹; Richard Skifton²; Patrick Calderoni²; ¹Boise State University; ²Idaho National Laboratory

10:40 AM

Microstructure and Mechanical Properties of Silicon Carbide Layer in TRISO-coated Fuel Particle Coated by Fluidized Bed Chemical Vapor Deposition at Various Temperatures: *Yeonku Kim*¹; InJin Sah²; Eung-Seon Kim²; ¹Korea Atomic Energy Research Institute; ²KAERI

11:00 AM

Pulse Electric Current Joining of Oxide-dispersion-strengthened Alloys: *Bai Cui*¹; Xueliang Yan¹; Fei Wang¹; Qin Zhou¹; Michael Nastasi¹; ¹University of Nebraska–Lincoln

WEDNESDAY AM

Materials Property Understanding through Characterization — Metals II

Program Organizers: Indrajit Dutta, Corning Incorporated; Nicholas Smith, Corning Incorporated

Wednesday AM
October 17, 2018

Room: B240/241
Location: Greater Columbus Convention Center

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

8:00 AM Invited

Three-dimensional Statistical Analysis of Deformation Twinning in HCP Titanium: *M Arul Kumar*¹; Laurent Capolungo¹; Rodney McCabe¹; Carlos Tome¹; ¹Los Alamos National Laboratory

8:40 AM

Bainite Transformation Kinetics of a Cr-Mo Medium Carbon Alloyed Steel: *Jian Zhu*¹; Xichen Sun¹; Gary Barber²; Xue Han²; Hao Qin¹; ¹FiatChrysler; ²Oakland University

9:00 AM

Thermo-mechanical Processing of Carbon-doped FeNiMnAlCr High Entropy Alloys: *Margaret Wu*¹; Ian Baker¹; Zhiming Li²; ¹Dartmouth College; ²Max Planck Institute

9:20 AM

Structure and Property Changes Occurring In 3rd Generation AHSS during Stamping: *Daniel Branagan*¹; Craig Parsons¹; Tad Machrowicz¹; Jonathan Cischke¹; Andrew Frerichs¹; Brian Meacham¹; Sheng Cheng¹; Alla Sergueeva¹; ¹NanoSteel Company Inc

9:40 AM

Effect of Time on Formation of Phases in the Slag during Tin Production: *Michel Kalenga Wa Kalenga*¹; David Mutombo¹; Willy Nheta¹; ¹University of Johannesburg

10:00 AM Break**10:20 AM**

Development and Characterisation of High Temperature Thermally Stable TiNi-based Shape Memory Alloys Using the Suspended Droplet Alloying Process: *Sheng Li*¹; Nicholas Adkins¹; Moatiz Attallah¹; ¹University of Birmingham

10:40 AM

Microstructural Behavior of Ti6Al4V during Room Temperature Deformation: *Gajanan Kulkarni*¹; ¹Bharat Forge Ltd.

11:00 AM

Structure and Magnetic Properties Correlation in Nanocrystalline Permalloy Alloy Powders: *Vamsi Meka*¹; Anuj Rathi¹; Kathem Bazzi¹; Chirantana Kuchimanchi¹; *Tanjore Jayaraman*¹; ¹University of Michigan-Dearborn

11:20 AM

The Use of Nanoidentation for Low Carbon Steel Wire Characterization: Alexis Gallegos Perez¹; Octavio Vazquez-Gomez²; Hector Vergara-Hernandez¹; Bernardo Campillo¹; Juan Salgado-Lopez³; *Allan Arenas-Serrano*⁴; ¹Morelia Institute of Technology; ²National Council For Science and Technology; ³Centro de Ingenieria y Desarrollo Industrial; ⁴Bilstein Cold Rolled Steel Ip

Mechanochemical Synthesis and Reactions in Materials Science III — Session I

Program Organizers: Antonio Fuentes, Cinvestav Unidad Saltillo; Laszlo Takacs, University of Maryland Baltimore County; Challapalli Suryanarayana, University of Central Florida; Huot Jacques, University Du Quebec A Trois Rivieres

Wednesday AM
October 17, 2018

Room: B131
Location: Greater Columbus Convention Center

Session Chair: Challapalli Suryanarayana, University of Central Florida

8:00 AM Invited

Mechanochemical Reactions of Oxides Followed by Multi-nuclear Magnetic Resonance Spectroscopy: *Vladimir Sepelak*¹; ¹Karlsruhe Institute of Technology

8:30 AM

Mechanochemical Synthesis of Highly Fluorescent Carbon Quantum Dots: *Richard Blair*¹; ¹University of Central Florida

9:00 AM

Mechanically Driven Phase Transformation in Sn Reinforced Al-Cu-Fe Quasicrystalline Matrix Nanocomposite: *Nilay Mukhopadhyay*¹; Yagnesh Shadangi¹; Joysurya Basu¹; Kausik Chattopadhyay¹; ¹Department of Metallurgical Engineering

9:30 AM

Formation, Structure and Reactivity of Mechanically Activated Composites Based on Transition Metal Oxides: *Andrey Streletskii*¹; Igor Kolbanev¹; Olga Morozova¹; ¹Institute of Chemical Physics RAS

10:00 AM Break**10:20 AM**

Mechanochemically Induced C-transformation: *Olena Vozniuk*¹; Michael Felderhoff¹; Ferdi Schüth¹; ¹Max-Planck-Institut für Kohlenforschung

10:40 AM

Ordering Processes in Oxides Obtained by Mechanical Milling: Revisiting the Existing Criteria to Predict the Formation and Stability of the Pyrochlore Structure: *Antonio Fuentes*¹; Sagrario Montemayor²; Miroslaw Maczka³; Ulises Amador⁴; ¹Cinvestav Unidad Saltillo; ²Centro de Investigación en Química Aplicada; ³Institute of Low Temperature and Structure Research; ⁴Universidad San Pablo CEU

Microalloyed Steels — Microalloyed Steels II

Program Organizers: Emmanuel De Moor, Colorado School of Mines; Steven Jansto, CBMM-North America Inc; Robert Glodowski, RJG Metallurgical LLC

Wednesday AM
October 17, 2018

Room: A225
Location: Greater Columbus Convention Center

Session Chair: Pello Uranga, CEIT

8:00 AM Invited

Canadian HSLA Steel Pipelines: History and Technology Developments: *Mohsen Mohammadijoo*¹; Laurie Collins²; Hani Henein¹; Douglas Ivey¹; ¹Univ of Alberta; ²EVRAZ Inc. NA



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COLUMBUS, OHIO, USA

8:30 AM

Microstructure and Toughness of Electric Resistance Welded API X70 Line Pipe: *Neil Anderson*¹; Yiyu Wang¹; Rangasayee Kannan¹; Atish Ray²; Muhammad Rashid²; Laurie Collins²; Leijun Li¹; ¹University of Alberta; ²Evrax Inc NA

8:50 AM

Modeling of the Effect of Run-out Table Cooling on the Microstructure of a Thick Walled X70 Skelp: *Hani Henein*¹; Antoine Van der Laan¹; Barry Wiskel¹; Doug Ivey¹; ¹University of Alberta

9:10 AM

Austenite Grain Growth in the HAZ of Line Pipe Steels: *Nicolas Romualdi*¹; Matthias Militzer¹; Warren Poole¹; Laurie Collins²; Robert Lazor³; ¹The University of British Columbia; ²Evrax, Inc.; ³Transcanada PipeLines Ltd.

9:30 AM

Development of Hot Rolled Ultra High Strength Steel with Enhanced Mechanical Properties: *Tihe Zhou*¹; David Overby¹; Peter Badgley¹; Chris Martin-Root¹; Xiang Wang²; Shenglong Liang²; Hatem Zurob²; ¹Stelco Inc; ²McMaster University

9:50 AM Invited

Niobium-containing Steel Metallurgy, Product Segments and Applications: *Steven Jansto*¹; ¹CBMM-North America Inc

10:10 AM Break

10:30 AM

A Case Study on Niobium Substituting Vanadium in Long Products: *Rafael Mesquita*¹; Yan Wang²; Bryan Williams²; John Heerema³; Steve Jansto¹; Bhaskar Yalamanchili⁴; ¹CBMM North America; ²Gerdau Long Steel North America, Cartersville Mill; ³Gerdau Long Steel North America, Saint Paul Mill; ⁴Gerdau Long Steel North America, Tampa Office

10:50 AM

Effect of Mo And Ti Addition on the Recrystallization Kinetics during Sub-critical Annealing and Tensile Property of HSLA Steel: *Pranabananda Modak*¹; Anish Karmakar²; Richa Gupta³; Debalay Chakrabarti¹; ¹Indian Institute of Technology Kharagpur; ²IISC Bangalore; ³Indian Institute of Technology Bombay

11:10 AM

Grain Size Distribution on a Forged Ni-Cr-Mo Low-alloy Steel: *Maria Jose Quintana*¹; Matt Kenney²; Thomas Ales²; Peter Collins²; Roberto Gonzalez¹; ¹Panamerican Univ; ²Iowa State University

Multiscale Modeling of Microstructure Deformation in Material Processing — Multiscale Modeling of Microstructure Deformation in Material Processing - Part I

Program Organizers: Lukasz Madej, AGH University of Science and Technology; Krzysztof Muszka, AGH University of Science and Technology; Danuta Szeliga, AGH University of Science and Technology; Jaimie Tiley, Air Force Office of Scientific Research

Wednesday AM
October 17, 2018

Room: C170
Location: Greater Columbus Convention Center

Session Chair: Jaimie Tiley, Air Force Office of Scientific Research (AFOSR/RTA)

8:00 AM Invited

Intermetallic Precipitates Enhance Twinability and Strain-hardenability of fcc-based High Entropy Alloys: Deep Choudhuri¹; Bharat Gwalani¹; Stephane Gorsse²; Mageshwari Komarasamy¹; Srinivas Mantri¹; Srivilliputhur Srinivasan¹; Rajiv Mishra¹; *Rajarshi Banerjee*¹; ¹University of North Texas; ²ICMCB-CNRS; Bordeaux INP

8:40 AM

Development of Multi-component EAM Potential for Ni-based Superalloys: *Muztoba Rabbani*¹; Sabila Kader Pinky¹; Ridwan Sakidja¹; ¹Missouri State University

9:00 AM

Evolution of Twin Boundary–dislocation Structures in Chemical Vapor Deposited Nickel upon Annealing: *Hao Sun*¹; Zhirui Wang¹; Chandra Veer Singh¹; ¹University of Toronto

9:20 AM

Molecular Dynamics Study of Creep Deformation in Nickel-based Superalloys: *Sabila Kader Pinky*¹; Muztoba Rabbani¹; Ridwan Sakidja¹; ¹Missouri State University

9:40 AM

Texture Evolution in Materials with Layered Crystal Structures: *Vamsi Krishna Vempati*¹; Raghavan Srinivasan¹; ¹Wright State University

10:00 AM Break

10:20 AM

Thermodynamics and Kinetics of Segregation in Ni-based Superalloys: *You Rao*¹; Maryam Ghazisaeidi¹; ¹Ohio State University

10:40 AM

Atomic Disorder during the Deformation of Ag Nanoparticles: Tushar Chitrakar¹; Michael Becker¹; John Keto¹; *Desiderio Kovar*¹; ¹University of Texas at Austin

11:00 AM

Developing Novel Microstructures Balancing between Strength and Ductility without Restoration Process in Commercial Al Alloys: *Khaled Adam*¹; David Field¹; ¹Washington State University

11:20 AM

Molecular Dynamics Simulation of the Influence of Voids and Vacancies to the Mechanical Properties of Single Crystal Aluminum: *Maosheng Li*¹; ¹Institute of Applied Physics and Computational Mathematics

WEDNESDAY AM

Multiscale Simulation and Experimental Validation of Additive Manufacturing Technologies: A Status Update by Academia, Solution Providers and Industry on Its Intake, Market Opportunities Now and Going Forward — Multiscale Simulation in Additive Manufacturing and 3DSIM-ANSYS AM Capabilities Demonstration

Program Organizers: Deepankar Pal, 3DSIM; Ankit Saharan, EOS; Anthony Rollett, Carnegie Mellon University; Adrian Sabau, Oak Ridge National Laboratory

Wednesday AM
October 17, 2018
Room: A221
Location: Greater Columbus Convention Center

Session Chairs: Kyle Johnson, Sandia National Laboratories; Javed Akram, ANSYS

8:00 AM Invited

Multiscale Modeling of Microstructure and Damage Evolution in the Performance of Additively Manufactured Parts: *Kyle Johnson*¹; Theron Rodgers¹; Joseph Bishop¹; Bradley Jared¹; Olivia Underwood¹; John Emery¹; Jonathan Madison¹; ¹Sandia National Laboratories

8:40 AM

A Modeling Tool for Mechanical Performance Prediction of Additive Manufacturing Parts: *Behrooz Jalalahmadi*¹; ¹Sentient Science

9:00 AM Demonstration

9:20 AM

Development of a Simulation Tool that Predicts the Structural Evolution of Parts Produced by Metal Additive Manufacturing: *Pradeep Chalavadi*¹; Deepankar Pal¹; Javed Akram¹; Brent Stucker¹; Dave Conover¹; ¹Ansys Inc

9:50 AM

Effect of Processing Parameters on Melt Pool Size, Porosity, and Microstructure in Inconel 718 Fabricated by Laser Powder Bed Fusion: Huan Zhang¹; Jano Farah¹; Olivia Pratt¹; *Pankaj Kumar*¹; Javed Akram¹; Chong Teng¹; Deepankar Pal¹; Manoranjan Misra¹; Z. Fang¹; ¹University of Utah

10:10 AM Break

10:30 AM Demonstration ANSYS AM Software Capabilities

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

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

Wednesday AM
October 17, 2018
Room: D181
Location: Greater Columbus Convention Center

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

8:00 AM Introductory Comments

8:40 AM

Fast Electrochemical Sensing of Phosphorus in Environmental Water with RuO₂-Ta₂O₅ Nanocomposite Film: Yukari Shigeta¹; Kenji Kawaguchi¹; *Masatsugu Morimitsu*¹; ¹Doshisha University

9:00 AM

Inhibition of Microbes Inducing Microbiologically-influenced Corrosion by Dialium Guineense Mediated Ag-nanoparticle Material: *Joshua Okeniyi*¹; Elizabeth Okeniyi¹; ¹Covenant University

9:20 AM

Freestanding 2D Bismuth for in Vivo Bioimaging and Cancer Therapy: *Yixiu Wang*¹; Jinghui Liu¹; Qian Zhang¹; Xiaoqi Liu¹; Wenzhuo Wu¹; ¹Purdue University

9:40 AM

LiCoNiFeO Nanocrystalline Cathode Particles for Lithium Ion Batteries-Prepared by Ultrasonic Spray Pyrolysis (USP) Method: Cigdem Toparli¹; Burcak Ebin²; *Sebahattin Gurmen*³; ¹Massachusetts Institute of Technology; ²Chalmers University of Technology; ³Istanbul Technical University

10:00 AM Break

10:20 AM

Liquid-solid Heterostructured Triboelectric Nanogenerator for Self-powered Wearable Smart Skin: *Shengjie Gao*¹; Wenzhuo Wu²; ¹Purdue University; ²School of Industrial Engineering, Purdue University

10:40 AM

Intrinsic Electrostatics of Platinum Nanoparticles in Solvated Environments: *James Goff*¹; ¹Pennsylvania State University

11:00 AM Concluding Comments

New Advances and Innovations in Corrosion of Refractory Ceramics — International Symposium on New Advances and Innovation in Corrosion of Refractory Ceramics I

Program Organizers: James Hemrick, Reno Refractories, Inc.; William Headrick, Jr, Missouri Refractories; Michel Rigaud, École Polytechnique

Wednesday AM
October 17, 2018
Room: A120
Location: Greater Columbus Convention Center

Session Chairs: James Hemrick, RENO Refractories Inc; William Headrick, Missouri Refractories; Michel Rigaud, École Polytechnique de Montréal

8:00 AM Introductory Comments: Dr. James Hemrick

8:05 AM Invited

The Glass Formation Boundary in Silicate Systems: Potential to Predict Corrosion Products: *William Carty*¹; Hyojin Lee²; ¹Alfred University; ²Alfred Univ

8:45 AM

Corrosion of ZrO₂-C Refractories for Submerged Entry Nozzle on the Interface between Molten Slag and Molten Iron Containing Different Amount of Carbon: Goto Kiyoshi; *Shigefumi Matsumoto*¹; Tamotsu Wakita¹; Katsumi Morikawa¹; Hatsu Taira¹; Jouki Yoshitomi¹; ¹Krosaki Harima Corporation

9:05 AM

Protection Mechanism of CMA-additive in MgO-C Ladle Bricks: *Scot Graddick*¹; Christoph Wöhrmeyer¹; Chris Parr¹; Josh Pelletier¹; Christos Aneziris²; Patrick Gehre²; ¹Imerys Aluminates; ²TU Bergakademie Freiberg

9:25 AM

Phosphates: Changes Occurring in Refractories Caused by Sintering and Use: *James Bennett*¹; Kyei-Sing Kwong¹; Anna Nakano²; Jinichiro Nakano²; Hugh Thomas¹; ¹National Energy Technology Laboratory; ²AECOM



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COLUMBUS, OHIO, USA

9:45 AM Introductory Comments Dr. William Headrick

10:05 AM Break

10:25 AM

Corrosion of Refractories in Gaseous Environments: Role of Binders and Additives: *Manoj Mahapatra*¹; ¹University of Alabama at Birmingham

10:45 AM

Effect of Clays Minerals Contained into Copper Sulphide Concentrates on Refractory Brick Wear during the Smelting Stage: *Julio Ossandón*¹; Leandro Voisin¹; Camila Pizarro¹; ¹Universidad de Chile

11:05 AM Concluding Comments: Dr. Michel Rigaud

Next Generation Biomaterials — Biomaterials IV

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

Wednesday AM

October 17, 2018

Room: D182

Location: Greater Columbus Convention Center

Session Chairs: Biqiong Chen, Queen's University Belfast; Akiyoshi Osaka, Henan University of Science & Technology

8:00 AM Invited

Bioactive Polymer Nanocomposite Hydrogels for Healthcare Applications: *Biqiong Chen*¹; Sungkwon Yoon¹; ¹Queen's University Belfast

8:20 AM

Investigation of Nanomechanical Properties of Dentin-bioceramic Interface: *Satish Alapati*¹; William Brantley²; Masahiro Iijima³; Shuichi Ito³; Takeshi Muguruma³; Takashi Saito³; Itaru Mizoguchi³; ¹University of Illinois at Chicago; ²Ohio State University; ³Health Sciences University of Hokkaido

8:40 AM

Design, fabrication and characterization of thin film biodegradable batteries with prospective applications for transient bioelectronics: *M.Mudasser Khan*¹; Waseem Haider¹; ¹Central Michigan University

9:00 AM Invited

Honeycomb Models for Cancellous Bone: FEM Simulation: *Akiyoshi Osaka*¹; Xuewen Chen¹; Guangxin Wang¹; Mitsugu Todo²; Jiaqi Liu¹; Jiye Wang¹; ¹Henan University Science & Technology; ²Kyushu University

9:20 AM

In-vivo and Ex vivo Studies of Biosynthesized Magnetic Nanoparticles for Specific Targeting of Triple Negative Breast Cancer: *John Obayemi*¹; Jingjie Hu²; Vanessa Uzonwanne³; Ali Salifu³; Karen Malatesta²; Derek Adler⁴; Edward Yurkow⁴; Winston Soboyejo³; ¹Worcester Polytechnic Institute; ²Princeton University; ³Wpi; ⁴Rutgers University

9:40 AM

Discovery of Biomaterials by Simulation and Experiment: Molecular Recognition, Assembly, Applications: *Hendrik Heinz*¹; ¹University of Colorado Boulder

10:00 AM Break

10:20 AM

Manufacturing Of Nanostructured Mg-Zn-Zr Wrought Sheets for Potential Application as a Biomaterial: *Peter Morcos*¹; Nancy Hassanein¹; Asma Amleha¹; Hanadi Salem¹; ¹American University in Cairo

10:40 AM

Micro-XRD Investigation of Bioactive Precipitates in Dental Bioceramics: Satish Alapati¹; Masahiro Iijima²; *William Brantley*³; Shuichi Ito²; Takeshi Muguruma²; Takashi Saito²; Itaru Mizoguchi²; ¹University of Illinois at Chicago; ²Health Sciences University of Hokkaido; ³Ohio State University

11:00 AM

Nanopatterned Bulk Metallic Glass Biosensors: *Emily Kinser*¹; ¹IBM

11:20 AM

Effect of Catalysts Used in Synthesis of Biodegradable Poly(p-dioxanone) on Its Thermal Degradation Behaviors: *Xiaoyang Li*¹; Peng Yang¹; ¹Institute of Electronic Engineering, China Academy of Engineering Physics

11:40 AM

Active Multi-particle Microrheology and the Importance of Bead Separation Distance: *David Gutschick*¹; Tyler Heisler-Taylor¹; David Yeung¹; Gunjan Agarwal¹; Heather Powell¹; Peter Anderson¹; Gregory Lafyatis¹; ¹The Ohio State University

Phase Transformations in Ceramics: Science and Applications — Phase Transformations in Ceramics: Science and Applications - Crystallography

Program Organizers: Waltraud Kriven, University of Illinois at Urbana-Champaign; Pankaj Sarin, Oklahoma State University; Yu Zhong, Worcester Polytechnic Institute

Wednesday AM

October 17, 2018

Room: A124

Location: Greater Columbus Convention Center

Session Chair: Pankaj Sarin, Oklahoma State University

8:00 AM Invited

In-situ Characterization of Solid-state Materials Using Synchrotron X-ray Diffraction Methods: *Sanjit Ghose*¹; Eric Dooryhee¹; ¹Brookhaven National Laboratory

8:30 AM Invited

In-situ Phase Diagram Determination of the HfO₂-Ta₂O₅ Binary Up to 3000 °C: Scott McCormack¹; Richard Weber²; Denys Kapush³; Alexandra Navrotsky³; *Waltraud Kriven*⁴; ¹University of Illinois Urbana-Champaign; ²Materials Development Inc; ³University of California Davis; ⁴University of Illinois Urbana-Champaign

9:00 AM Invited

Rare Earth Disilicate Phase Transformations: *Randall Hay*¹; Emmanuel Boakye¹; Pavel Mogilevsky¹; Thomas Key¹; ¹USAF

9:30 AM Invited

Topotactic Motif and Orientation Relation Extraction for Phase Transformations from In-situ X-ray Powder Diffraction: *Scott McCormack*¹; Waltraud Kriven¹; ¹University of Illinois Urbana-Champaign

10:00 AM Break

10:20 AM

The Effect of Mg²⁺ Doping on the Phase Transformation and Thermal Expansion Properties of DyNbO₄: *Dan Lowry*¹; Pankaj Sarin¹; ¹Oklahoma State University

10:40 AM

Tailoring the RENbO₄ Phase Transformation through Zr⁴⁺ Co-Substitution: *Dan Lowry*¹; Pankaj Sarin¹; ¹Oklahoma State University

WEDNESDAY AM

11:00 AM

Thermal Expansion and Phase Transformation Kinetics in the Lanthanide Ditanate System: *Benjamin Hulbert*¹; ¹Materials Science Dept. at the University of Illinois

11:20 AM

Ferroelectric e-WO₃: Synthesis and Application: *Owen Abe*¹; Gagan Jodhani¹; Perena Gouma¹; ¹The Ohio State University

11:40 AM

Structurally Stable, High-entropy, Lanthanide Sesquioxides: *Kuo-Pin Tseng*¹; Waltraud Kriven¹; ¹University of Illinois Urbana Champaign

PSDK XIII: Phase Stability and Diffusion Kinetics — Computational Tools and Diffusion

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

Wednesday AM
October 17, 2018

Room: A213
Location: Greater Columbus Convention Center

Session Chairs: Raymundo Arroyave, Texas A & M University; James Saal

8:00 AM Invited

Developing the Next Generation of Tools for Materials by Design®: *James Saal*¹; Jeff Doak¹; Abhinav Saboo¹; Ricardo Komai¹; Greg Olson¹; ¹QuesTek Innovations LLC

8:30 AM

Towards the Automated Development of a Cr-Fe-Ni-Ti-V CALPHAD Database: *Brandon Bocklund*¹; Richard Otis²; Zi-Kui Liu¹; ¹Pennsylvania State University; ²NASA Jet Propulsion Lab

8:50 AM

Diffusion Kerf Couples for Synthesis and Screening of Non-equimolar High Entropy Alloys: *Nagraj Kulkarni*; ¹

9:10 AM

Simultaneous Measurement of Tracer and Interdiffusion Coefficients via Isotope Free Diffusion Couple Experiments for Cu-Ni and Co-Cr-Fe-Ni Alloys: *Abhishek Mehta*¹; Esin Schulz¹; Irina Belova²; Graeme Murch²; Yongho Sohn³; ¹Univ of Central Florida; ²The University of Newcastle; ³University of Central Florida

9:30 AM

A First-principles Investigation of Various Vibrational Entropy Contribution Methods on Self-diffusion Coefficient Calculations in FCC Metals: *John O'Connell*¹; Chelsey Hargather¹; Harrison Lee¹; ¹New Mexico Institute of Mining & Technology

9:50 AM

Self-diffusion of Ti Interstitial Based Point Defects and Complexes in TiC: *Weiwei Sun*¹; Hossein Ehteshami²; Paul Kent³; Pavel Korzhavyi²; ¹Oak Ridge National Laboratory; ²KTH-Royal Institute of Technology; ³Oak Ridge National Laboratory

10:10 AM Break

10:30 AM

Diffusion of Co-Cr, Co-Ta, and Co-Cr-Ta: *Kil-Won Moon*¹; Maureen Williams¹; Greta Lindwall²; Carelyn Campbell¹; ¹National Institute of Standards & Tech; ²KTH

10:50 AM

First Principles Calculation of Self-diffusion in Unstable bcc Titanium: *Zhangqi Chen*¹; Yaxian Wang¹; Wolfgang Windl¹; Ji-Cheng Zhao¹; ¹Ohio State University

11:10 AM

Atomic Mobility Assessment of the Mg-Al-Li System: *Wei Zhong*¹; Ji-Cheng Zhao¹; ¹Ohio State University

Rare Earth Metals and Critical Materials: Synthesis, Processing, Production, Recent Advances — Critical Materials Resources and Regulatory Issues

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

Wednesday AM
October 17, 2018

Room: A224
Location: Greater Columbus Convention Center

Session Chairs: Mary Anne Alvin, National Energy Tech Lab; Yellapu Murty, MC Technologies

8:00 AM Invited

DOE's Critical Materials Institute Investment: *David Hardy*¹; ¹DOE EERE AMO

8:40 AM Invited

Alternative Scenario for Rare Earth Self Sufficiency: *James Kennedy*¹; ¹Three Consulting

9:20 AM

Agent-based Modeling of Supply Disruptions in the Global Rare Earths Market: *Matthew Riddle*¹; Anna Jacobson²; Elisa Alonso³; Diane Graziano¹; ¹Argonne National Laboratory; ²Defense Logistics Agency, Strategic Materials; ³Oak Ridge National Laboratory

9:50 AM Break

10:10 AM Invited

Building and Utilizing a Thermochemical Databank of Rare Earth Solids: *Paul Kim*¹; Daniel Kopp¹; Zhichao Hu¹; Gaurav Das²; Lili Wu³; Paul Antonick¹; Ali Eslamimanesh²; Andrzej Anderko²; Alexandra Navrotsky³; Richard Riman¹; ¹Rutgers University; ²OLI Systems, Inc.; ³University of California Davis

10:50 AM

Creating a Circular Economy for Hard Disk Drives: A Shared Vision: *Carol Handwerker*¹; William Olson; Mark Schaefer²; ¹Purdue University; ²iNEMI



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

Semiconductor Heterostructures: Theory, Growth, Characterization, and Device Applications — Semiconductor Heterostructures I

Program Organizers: John Ayers, University of Connecticut; Ganesh Balakrishnan, University of New Mexico; Phil Ahrenkiel, South Dakota School of Mines & Technology

Wednesday AM
October 17, 2018

Room: B132
Location: Greater Columbus Convention Center

Session Chair: Phil Ahrenkiel, South Dakota School of Mines and Technology

8:00 AM Introductory Comments

8:10 AM

Atomic-scale Digital Alloying for III-Sb Metamorphic Buffers: *Tyler Grassman*¹; Vinita Dahiya²; Julia Deitz²; Sanjay Krishna²; ¹Ohio State University; ²Ohio State Univ

8:30 AM

Heterostructures to Limit Dislocation Propagation in GaAs on Flexible-Ge/metal Substrates: *Phil Ahrenkiel*¹; Xavier Pasala¹; Nathan Smaglik¹; Nikhil Pokharel¹; Monika Rathi¹; Pavel Dutta¹; Venkat Selvaminnickam¹; ¹South Dakota School of Mines & Technology

8:50 AM

Modeling Charge Transport through Metal/Oxide Heterostructures: *Maytal Caspary Toroker*¹; ¹Technion - Israel Institute of Technology

9:10 AM

TEM and EDS Based Investigation of Failure Mechanism in III-Sb Semiconductor Diodes: *Sadhvikas Addamane*¹; Emma Renteria¹; Ahmad Mansoori¹; Kevin Reilly¹; Ganesh Balakrishnan¹; ¹University Of New Mexico

9:30 AM

Persistent Photoconductivity and Defect Characterization in GaN/AlGaIn Heterostructures Using Transient Hall Effect Measurements: *David Daughton*¹; BoKuai Lai¹; Jeffery Lindemuth¹; ¹Lake Shore Cryotronics

9:50 AM

Strain Effect on Electrical and Thermal Transport Properties of 2D Transition Metal Dichalcogenide Heterostructures: *Lan Li*¹; ¹Boise State University

10:10 AM Break

10:30 AM

The Properties of Sputter-deposited Gallium Oxide Thin Films: *Tom Oder*¹; Sundar Isukapati¹; ¹Youngstown State University

10:50 AM

Theoretical Optimization of Graded Semiconductor Buffer Layers: *Tedi Kujofsa*¹; Minglei Cai¹; Xinkan Chen¹; Md Tanvirul Islam¹; John Ayers; ¹University Of Connecticut

Sintering and Related Powder Processing Science and Technologies — Field Assisted Sintering II: Applications

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

Wednesday AM
October 17, 2018

Room: B142/143
Location: Greater Columbus Convention Center

Session Chair: Wolfgang Rheinheimer, Purdue University

8:00 AM

Investigation the Effects of Mo-Si-B and Mo-Si-Al Coatings on Oxidation Behavior of TZM Alloy Prepared by Spark Plasma Sintering: *Baris Yavas*¹; Gultekin Goller¹; ¹Istanbul Technical University

8:20 AM

Preparation and Characterization of B4C- ZrB2 Composites by Reactive Spark Plasma Sintering: *Leyla Yanmaz*¹; Gultekin Goller¹; Onuralp Yucel¹; Filiz Sahin¹; ¹Istanbul Technical University

8:40 AM

Production and Characterization of Spark Plasma Sintered Hybrid GNT Reinforced ZrC-TiC composites: *Burak Cagri Ocak*¹; Baris Yavas¹; Ipek Akin¹; Onuralp Yucel¹; Filiz Sahin¹; Gultekin Goller¹; ¹Istanbul Technical University

9:00 AM

Production and Characterization of TZM Based TiC or ZrC Reinforced Composites Prepared by Spark Plasma Sintering: *Cansinem Tuzemen*¹; Baris Yavas¹; Ipek Akin¹; Sebahattin Gurmen¹; Onuralp Yucel¹; Filiz Sahin¹; Gultekin Goller¹; ¹Istanbul Technical University

9:20 AM

Spark Plasma Sintering of High-energy Ball Milled Mg-Al Alloys: *Mohammad Umar Farooq Khan*¹; Taban Larimian²; Tushar Borkar²; Rajeev Gupta¹; ¹University of Akron; ²Cleveland State University

9:40 AM

Spark Plasma Sintering of Pure Cadmium: *Somi Doja*¹; Anil Prasad¹; Lukas Bichler¹; ¹University of British Columbia

10:00 AM Break

10:20 AM

Spark Plasma Sintering of Soft Magnetic Materials: *Taban Larimian*¹; Tushar Borkar¹; ¹Cleveland State University

10:40 AM

Spark Plasma Sintering Behaviour of BaTiO3 Ceramics under Different Atmospheres: *Demet Aydogmus*¹; Gultekin Goller¹; Onuralp Yucel¹; Filiz Sahin¹; ¹Istanbul Technical University

11:00 AM

Densification and Microstructure of Fe-Cr-Mo-B-C Alloy Fabricated by Spark Plasma Sintering: *Ahmad Sorour*¹; Adedayo Adeniyi¹; Mohamed Hussein¹; Choongnyun Kim²; Nasser Al-Aqeeli¹; ¹King Fahd University of Petroleum & Minerals; ²LiquidMetal Coating

WEDNESDAY AM

Small-scale Properties of Materials and Length-scale Phenomena — Stress/Strain Behavior

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

Wednesday AM
October 17, 2018

Room: A121
Location: Greater Columbus Convention Center

Session Chairs: David Bahr, Purdue University; Charles Lu, University of Kentucky

8:00 AM Invited

Critical Film Thicknesses of Ductile-brittle Multilayers for Optimized Electro-mechanical Behavior: *Megan Cordill¹; ¹Erich Schmid Institute*

8:20 AM Invited

The Mechanical Properties of Small-scale 122 Compounds: *Christopher Weinberger¹; Ian Bakst¹; John Sypek²; Keith Dusoe²; Keara Frawley²; Seok-Woo Lee²; Paul Canfield³; ¹Colorado State University; ²University of Connecticut; ³Iowa State University*

8:40 AM Invited

Small-scale Testing in Harsh Environments: A New Insight into Hydrogen Embrittlement: *Afroz Barnoush¹; Yun Deng²; Tarlan Hajilou²; Bjorn Rune Rogne²; Dong Wang²; Xu Lu²; ¹Norwegian University of Science and Technology; ²Ntnu*

9:00 AM Invited

Nanomechanical Mapping for Measuring Individual Phases: *Douglas Stauffer¹; Eric Hintsala¹; Ude Hangen¹; ¹Bruker Nano Surfaces*

9:20 AM Invited

Novel Mechanical Properties of Core-shell Nanostructures: *Robert Fleming¹; Jason Steck¹; Min Zou¹; ¹University of Arkansas*

9:40 AM

Mechanical Characterization and Determining Flow Behavior of Dual Phase Steels Using Nanoindentation: *Raheleh Mohammad Rahimi¹; David Bahr¹; ¹Purdue University*

10:00 AM Break**10:20 AM Invited**

Nickel Nanoparticles Set a New Record of Strength: *Amit Sharma¹; James Hickman²; Nimrod Gazit¹; Eugen Rabkin¹; Yuri Mishin²; ¹Technion; ²George Mason University*

10:40 AM Invited

Understanding the Mechanical Behavior of Electrode Materials for Improving the Performance and Durability of Lithium ion batteries: *Yang-Tse Cheng¹; ¹University of Kentucky*

11:00 AM Invited

Small-scale Mechanics of Super-strong Silver Nanostructures: *Frederic Sansoz¹; ¹The University of Vermont*

11:20 AM Invited

Insights from Continuum Dislocation Dynamics on the Micro-mechanics of Polycrystals from Yielding to Large Deformation: *Hesam Askari¹; ¹University of Rochester*

11:40 AM

The Design of Core-shell Structure Carbides in Ultrahigh Strength Steels: *Wei Sheng¹; Zurui Zhang²; Ye Tian²; Wei Xiong³; Gregory Olson¹; ¹Northwestern University; ²Beijing Institute of Aeronautical Materials; ³University of Pittsburgh*

Solid State Processing — Solid State Processing

Program Organizers: Richard Fonda, Naval Research Laboratory; Simon Larose, National Research Council Canada

Wednesday AM
October 17, 2018

Room: B140/141
Location: Greater Columbus Convention Center

Session Chair: Simon Larose, National Research Council Canada

8:00 AM

Solid State Processing of Ultra-high Conductivity Alloys via Hot Extrusion Alloying: *Keerti Kappagantula¹; Frank Kraft¹; ¹Ohio University*

8:20 AM

Effect of Spark-plasma Sintering Parameters on the Hardness and Porosity of High-energy Ball Milled Al-20 at.% V alloys: *Javier Esquivel¹; Taban Larimian²; Tushar Borkar²; Rajeev Gupta¹; ¹The University of Akron; ²Cleveland State University*

8:40 AM

Analysis of Aluminum Alloy Feedstock Powder used in Solid State Processes: *Caitlin Walde¹; Danielle Cote¹; Richard Sisson¹; Victor Champagne²; ¹Worcester Polytechnic Institute; ²US Army Research Laboratory*

9:00 AM

Microstructure Evolution during Solid-state Ambient Condition Metal Additive Manufacturing: *Anagh Deshpande¹; Keng Hsu¹; ¹University of Louisville*

9:20 AM

Evaluation of Ultrasonic Additive Manufacturing Part Tolerances via X-ray Computed Tomography: *Jennifer Sietins¹; Adam Hehr²; Justin Wenning²; Mark Norfolk²; ¹Army Research Laboratory; ²Fabrisonic*

9:40 AM

Effects of Squeeze Factor on the Microstructure and Surface Finish of Incrementally Formed Parts: *Maya Nath¹; Ankush Bansal¹; Jaekwang Shin¹; Randy Cheng¹; Mihaela Banu¹; Alan Taub¹; ¹University of Michigan*

10:00 AM Break**10:20 AM**

Introducing Gradient Structure for Improving Mechanical Properties of TRC-AZ31: *Maryam Jamalian¹; David Field¹; ¹Washington State University*

10:40 AM

Surface Roughness Study of Al6061 Alloy by Burnishing: *Mohammed Tashkandi¹; ¹Northern Border University*



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

Surface Protection and Spray Technology for Enhanced Materials Performance: Science, Technology, and Application — Environmental and Thermal Barrier Coatings

Program Organizers: Kang Lee, NASA Glenn Research Center; Jun Song, McGill University; Yutaka Kagawa, The University of Tokyo; Dongming Zhu, NASA Glenn Research Center; Rodney Trice, Purdue University; Daniel Mumm, University of California, Irvine; Mitchell Dorfman, Oerlikon Metco (US) Inc.; Christian Moreau, Concordia University; Emmanuel Boakye, UES Inc.; Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory; Richard Chromik, McGill University; Stephen Yue, McGill University

Wednesday AM
October 17, 2018
Room: B234
Location: Greater Columbus Convention Center

Session Chairs: Kang Lee, NASA Glenn Research Center; Dongming Zhu, NASA Glenn Research Center

8:00 AM Invited

Environmental Durability of Plasma Spray-Physical Vapor Deposition (PS-PVD) Coatings on Si-based Ceramics: *Bryan Harder*¹; Kang Lee¹; Sreeramesh Kalluri²; ¹NASA Glenn Research Center; ²Ohio Aerospace Institute

8:40 AM

EB-PVD T/EBCs for Oxide Fiber Ceramic Composites: *Thomas Drtina*¹; Sarah Miller¹; Stefan Lampenscherf²; Frank Zok¹; Carlos Levi¹; ¹University of California, Santa Barbara; ²Siemens Corporate Technology

9:00 AM

High-Temperature Interactions between Environmental Barrier Coating (EBC) Ceramics and Calcium-magnesium-alumino-silicate (CMAS) Glass: *Laura Turcer*¹; Amanda Krause¹; Lin Zhang¹; Hector Garces¹; Nitin Padture¹; ¹Brown University

9:20 AM

Compositional and Microstructural Effects in the Protection of SiC Components under Water Vapor Conditions: *Benjamin Kowalski*¹; Bryan Harder¹; Kang Lee¹; Nathan Jacobson¹; ¹NASA Glenn Research Center

9:40 AM

A Predictive Computational Route to Quantitatively Evaluate the Effect of Doping on Reducing Thermal Conductivity of Ceramic Oxides: *Jun Song*¹; Guoqiang Lan¹; ¹McGill University

10:00 AM

A Custom Built Framework for Thermal Modeling of Plasma Spray: *Tom Stockman*¹; Kendall Hollis²; John Carpenter²; Judith Schneider¹; ¹University of Alabama in Huntsville; ²Los Alamos National Laboratory

Synergy in Multiscale Modeling and Experiments to Resolve Complex Disordered Solids — Session II: Experimentally-driven Synergy

Program Organizers: Ridwan Sakidja, Missouri State University; Jinwoo Hwang, Ohio State University; Jincheng Du, University of North Texas; Matthew Kramer, Iowa State University; David Drabold, Ohio University

Wednesday AM
October 17, 2018
Room: B246
Location: Greater Columbus Convention Center

Session Chairs: Jinwoo Hwang, The Ohio State University; Matthew Kramer, Ames National Laboratory

8:00 AM Invited

Local Structure Evolution of Amorphous Chalcogen Electrodes: *Vicky Doan-Nguyen*¹; ¹The Ohio State University

8:40 AM

Quantification of Correlated Disorder in Alloy Systems Through Complex PDF Modelling: *Robert Koch*¹; Shubham Pandey²; Guangfang Li³; Hui Wang³; Simon Phillpot²; Scott Mixture¹; ¹Alfred University; ²University of Florida; ³University of South Carolina

9:10 AM

Atomistic Modelling of Amorphous Boron Carbide Materials (B4C): *Rajan Khadka*¹; Nirmal Baishnab¹; Ridwan Sakidja¹; ¹Missouri State University

9:30 AM

Multiscale Modeling of the Elasto-plastic Behavior of Architected and Nanostructured Cu-Nb Composite Wires and Comparison with Neutron Diffraction Experiments: *Tang Gu*¹; David McDowell²; ¹Georgia Tech; ²Georgia tech

10:00 AM Break

10:20 AM Invited

Nanoscale Origins of Structure-property Correlation in Metallic Glasses: Combining Kinetic Monte Carlo with 4D STEM: *Pengyang Zhao*¹; Ju Li²; Jinwoo Hwang¹; Yunzhi Wang¹; ¹The Ohio State University; ²MIT

11:00 AM

Direct Mapping of Structural Heterogeneity in Amorphous Hydrogenated Boron Carbide Thin Films Using Four-dimensional Scanning Transmission Electron Microscopy: Soohyun Im¹; Menglin Zhu¹; Ridwan Sakidja²; Nathan Oyler³; Michelle Paquette³; Paul Rulis³; *Jinwoo Hwang*¹; ¹Ohio State University; ²Missouri State University; ³University of Missouri Kansas City

11:30 AM

On the Connection between the Electronic Structure and the Thermomechanical Properties of Zr-based Bulk Metallic Glass: *Ridwan Sakidja*¹; Batu Hunca²; Chamila Dharmawardhana³; Wai-Yim Ching⁴; ¹Missouri State Univ; ²Trakya University; ³Georgetown University; ⁴University of Missouri- Kansas City

WEDNESDAY AM

Thermal Protection Materials and Systems — TPS Design and Materials Characterizations

Program Organizers: Jeff DeMange, University of Toledo; Sylvia Johnson, NASA Ames Research Center; Thomas Reimer, DLR; Wolfgang P.P. Fischer, AIRBUS D&S

Wednesday AM
October 17, 2018

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

Session Chairs: Jeff DeMange, University of Toledo; Thomas Reimer, German Aerospace Center DLR; Arturs Jasjukevics, ArianeGroup; Frances Hurwitz, NASA Glenn Research Center

8:00 AM Invited

Investigation of Spray-on Layers of Cork and Aerogels as External Thermal Protection Systems: *Thomas Reimer*¹; Christian Zuber¹; Barbara Milow¹; ¹DLR

8:30 AM

Ariane 6 Upper Liquid Propulsion Module Thermal Protection Hardware Development: *Arturs Jasjukevics*¹; ¹ArianeGroup

8:50 AM

Intumescent Passive Fire Protection Coatings: *Hong Li*¹; Jeffrey Davis¹; Arif Mubarak¹; ¹PPG Industries

9:10 AM

Composite Materials Development and Testing Utilizing Ultrasonic NDE Techniques for High Temperature Applications: *Ming Chen*¹; Derek King²; Lingchuan Li³; Ray Ko³; ¹Air Force Research Laboratory; ²UES; ³UDRI

9:30 AM

Microstructure-sensitive Crack Formation in Continuous Fiber Reinforced Ceramic Matrix Composites: *Reece Hunt*¹; Dipen Patel²; Jennifer Pierce³; Daniel Rapping³; Michael Braginsky³; Triplicane Parthasarathy²; *Craig Przybyla*⁴; ¹Wright State University; ²UES, Inc.; ³University of Dayton Research Institute; ⁴Air Force Research Laboratory

9:50 AM

Anisotropic Heat Conduction in Flexible 2-D Woven Ceramic Fibers for Extreme Atmospheric Entry Environments: *Rodrigo Penide-Fernandez*¹; Frederic Sansoz¹; ¹The University of Vermont

10:10 AM Break**10:30 AM**

Oxidation Kinetics of High Entropy Carbide and Boride UHTCs: *Lavina Backman*¹; Elizabeth Opila¹; ¹University of Virginia

10:50 AM

Sensible Heat Capacity of Phenolic Resin: *Sacha Wason*¹; *Tom Ashbee*¹; Stephen Till¹; David Payne¹; ¹Dstl

11:10 AM

Heat of Pyrolysis of Phenolic Resin: *Sacha Wason*¹; *Matthew Parry*¹; David Payne¹; ¹Dstl

Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications — High Entropy Alloys

Program Organizers: Ali Yousefiani, Boeing Research And Technology; Troy Topping, California State University, Sacramento; Robert Dillon, Jet Propulsion Laboratory; Linruo Zhao, NRC Aerospace

Wednesday AM
October 17, 2018

Room: B235
Location: Greater Columbus Convention Center

Session Chair: Ali Yousefiani, Boeing Research & Technology

8:00 AM Keynote

Development and Exploration of Refractory High Entropy Alloys: A Review: *Oleg Senkov*¹; *Daniel Miracle*¹; Jean-Phillipe Couzine²; Kevin Chaput¹; ¹Air Force Research Laboratory; ²Universite Paris Est ICMPE

8:40 AM

An Integrated Computational Materials Engineering (ICME) Design and Scale-up of High-entropy Alloys (HEAs) for Turbine Alloy Replacement: *Ricardo Komai*¹; David Smathers²; Marie Thomas¹; James Saal¹; François Dary²; ¹QuesTek Innovations LLC; ²H.C. Starck

9:00 AM

The Microstructure and Mechanical Properties of High Strength, Ductile, Eutectic FeNiMnAl(Cr,Ti) High-entropy Alloys: *Ian Baker*¹; Zhangwei Wang¹; Margaret Wu¹; Fanling Meng¹; ¹Dartmouth College

9:20 AM

First-principles Methods of Calculating Stacking Fault Energies in Refractory BCC High-entropy Alloys: *Joshua Strother*¹; Alexandra Scheer¹; Chelsey Hargather¹; ¹New Mexico Institute of Mining & Technology

9:40 AM Invited

Processing, Microstructure and Mechanical Characterization of MgAlLiZnCaCu High Entropy Alloy: *Khin Tun*¹; Angad Yadav²; Abhishek Sharma³; Manoj Gupta¹; *Tirumalai Srivatsan*⁴; ¹National University of Singapore; ²National Institute of Technology Agartala; ³IIT(ISM) Dhanbad, Jharkhand; ⁴The University of Akron

10:10 AM Break**10:30 AM**

Mechanical and Thermal Stability of Nanocrystalline High-entropy Alloys: *Yu Zou*¹; ¹University of Toronto

10:50 AM

Hydrogen-induced Intergranular Failure of Compositionally Complex Equimolar FeNiCoCr Alloy: *Kelly Nygren*¹; Shuai Wang²; *Kaila Bertsch*²; Hongbin Bei³; Akihide Nagao⁴; Ian Robertson²; ¹Cornell University; ²University of Wisconsin-Madison; ³Oak Ridge National Laboratory; ⁴International Institute for Carbon-Neutral Energy Research (WPI-I2CNER)

11:10 AM

Long-term Annealing of Mechanically-alloyed Refractory High Entropy Alloy: *Joshua Smeltzer*¹; B. Chad Hornbuckle²; Anit Giri²; Christopher Marvel¹; Kristopher Darling²; Jeffrey Rickman¹; Helen Chan¹; Martin Harmer¹; ¹Lehigh University; ²Army Research Laboratory



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

ACerS Robert B. Sosman Award Symposium: Lead-free Piezoceramics: From Local Structure to Application — ACerS Basic Science Division Robert B. Sosman Lecture

Program Organizers: Jurij Koruza, Technische Universität Darmstadt; Jürgen Rödel, Technische Universität Darmstadt

Wednesday PM Room: A111/112
October 17, 2018 Location: Greater Columbus Convention Center

1:00 PM Invited

Lead-free Piezoceramics: From Local Structure to Application: *Jürgen Rödel*¹; ¹Technische Universität Darmstadt

ACerS Robert B. Sosman Award Symposium: Lead-free Piezoceramics: From Local Structure to Application — Session II

Program Organizers: Jurij Koruza, Technische Universität Darmstadt; Jürgen Rödel, Technische Universität Darmstadt

Wednesday PM Room: A111/112
October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Rajendra Bordia, Clemson University

2:00 PM Invited

Relaxor-ferroelectric Transitions: Sodium-bismuth-titanate Derivatives: *Jacob Jones*¹; ¹North Carolina State University

2:40 PM Invited

High Piezoelectricity in BaTiO₃-based Pb-free Materials: The Role of Multi-phase Coexisting Point: *Ren Xiaobing*¹; ¹National Institute For Materials Science

3:20 PM Break

3:40 PM Invited

Industrial Development of Lead-free Piezoelectric Materials and Devices: *Ruiping Wang*¹; Kenji Shibata²; Tonshaku Tou³; Jurij Koruza⁴; ¹National Institute of Advanced Industrial Science and Technology; ²SCIOCS Co.Ltd; ³Honda Electronics Co. Ltd; ⁴Technische Universität Darmstadt

Additive Manufacturing of Composites and Complex Materials III — Polymer Additive Manufacturing

Program Organizers: Dirk Lehmus, Fraunhofer - Ifam; Jonathan Spowart, Air Force Research Laboratory; Nikhil Gupta, New York University; Eric Jaegle, Max-Planck-Institut Fuer Eisenforschung

Wednesday PM Room: A222
October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM

Morphology-performance-processing Relationships in Additively Manufactured Epoxy Composites for Thin-walled Cellular Structures: *Andrew Abbott*¹; Kyle Johnson²; Harry Pierson³; Emrah Celik⁴; Gyaneshwar Tandon¹; Hilmar Koerner⁵; Jeffery Baur⁵; Katie Thorp⁵; ¹UDRI; ²UES; ³University of Arkansas; ⁴University of Miami; ⁵Air Force Research Laboratory

2:30 PM

Effect of Lattice Density on the Mechanical Behavior of FDMed Composites: *Ozgur Keles*¹; Eric Anderson¹; Jimmy Huynh¹; Jeff Gelb²; Jouni Freund³; Alk Karakoc³; ¹San Jose State University; ²Sigray, Inc.; ³Aalto University

2:50 PM

Large Scale Additive Manufacturing of Tunable Reactive Polymers: *William Carter*¹; Orlando Rios¹; Cynthia Kutcho²; ¹Oak Ridge National Laboratory; ²PPG Industries

3:20 PM

Thermo-mechano-rheological Principles of Filament Manufacturing for Additive Manufacturing: *Ashish Singh*¹; *Rakesh Behera*¹; *Mrityunjay Doddamani*²; *Nikhil Gupta*¹; ¹New York University; ²National Institute of Technology, Surathkal

3:40 PM Break

4:00 PM

Additive Manufacturing of Structural Energetic Nanocomposites: *Keerti Kappagantula*¹; ¹Ohio University

4:20 PM

Applications Mixture Design Statistical Method with Special Focus on Simplex Centroid Design: *Betighu Jimma*¹; ¹Saint-Gobain

4:40 PM

Polymer Derived Ceramics with High Geometric Accuracy: *Xuehui Yang*¹; Jing Zhang¹; Hye-Young Park²; Yeon-Gil Jung²; ¹Indiana University - Purdue University Indianapolis; ²Changwon National University

5:00 PM Question and Answer Period

5:20 PM Concluding Comments

Additive Manufacturing of Metals: Microstructure and Material Properties — Microstructure and Properties of AM Ti-6Al Alloy

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

Wednesday PM Room: A214
October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Andrzej Wojcieszynski, ATI Specialty Materials

2:00 PM

Microstructure and Properties of Additively Manufactured Ti-6Al-4V: *V. Sinha*¹; K.J. Chaput²; E.J. Schwalbach²; T.M. Butler²; N. Schehl³; R. John²; ¹Air Force Research Laboratory/UES, Inc.; ²Air Force Research Laboratory; ³University of Dayton Research Institute

2:20 PM

Microstructure Control and Mechanical Testing of Electron Beam Additively Manufactured Ti-6Al-4V: *Rahi Patel*¹; Sneha Narra¹; Jack Beuth¹; ¹Carnegie Mellon University

2:40 PM

Novel Ti-6Al-4V Microstructure Design Pathways via Cyclic Heat Treatments during Selective Laser Melting: *Atieh Moridi*¹; Ali Gökhan Demir²; Leonardo Caprio²; Barbara Privitali²; Bianca Colosimo²; John Hart¹; Cem Tasan¹; ¹Massachusetts Institute of Technology; ²Politecnico di Milano

3:00 PM

Elevated Temperature Deposition of Ti-6Al-4V in the Laser Powder Bed Fusion Process: *Brian Fisher*¹; *Jack Beuth*¹; ¹Carnegie Mellon University

WEDNESDAY PM

3:20 PM Break**3:40 PM**

In-situ Synchrotron X-ray Diffraction Line-profile Analysis during Tensile Deformation in Additively Manufactured Ti-6Al-4V Alloy: *Kenta Yamanaka*¹; Asumi Kuroda²; Miyu Itoh²; Manami Mori³; Takahisa Shobu⁴; Shigeo Sato²; Akihiko Chiba¹; ¹Tohoku University; ²Ibaraki University; ³National Institute of Technology, Sendai College; ⁴Japan Atomic Energy Agency

4:00 PM

Processing-microstructure-property Relationship in Additive Manufactured (Laser Engineered Net Shaping, LENS) Ti-6Al-4V Alloy: *Shibayan Roy*¹; Souvik Sahoo¹; Anuja Joshi¹; Anoop Maurya¹; Vamsi Balla²; Mitun Das²; ¹Materials Science Center, Indian Institute of Technology Kharagpur; ²Bioceramics & Coating Division, CSIR-Central Glass and Ceramics Research Institute, Kolkata,

4:20 PM

Influence of Microstructure and Porosity on the Mechanical Properties of L-PBF Ti-6Al-4V: *Thomas Voisin*¹; Nicholas Calta¹; Joseph McKeown¹; Ross Cunningham²; Anthony Rollett²; Yinmin Wang¹; ¹Lawrence Livermore National Laboratory; ²Carnegie Mellon University

4:40 PM

The Influence of Processing Parameters on Strut Diameter and Internal Porosity in Ti6Al4V Cellular Structure: *Hala Salem*¹; L.N. Carter²; M.M. Atallah²; H.G. Salem¹; ¹AUC; ²University of Birmingham

5:00 PM

The Non-uniform Mechanical Properties and Microstructure of Ti6Al4V Components Fabricated Using DED Additive Manufacturing Process: *Chang Keun Chun*¹; Sung-wook Kim¹; Dae-jung Kim²; Yeong-do Park³; ¹RIST; ²Insstek; ³Dong-Eui University/Department of Advanced Materials Engineering

Additive Manufacturing of Metals: Microstructure and Material Properties — Modeling and Alloy Development for AM

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

Wednesday PM
October 17, 2018

Room: A215
Location: Greater Columbus Convention Center

Session Chair: Jack Beuth, Carnegie Mellon University

2:00 PM

High-throughput Screening for Metal Additive Manufacturing Processes: Simulation and Experiment: *Yu Zou*¹; ¹University of Toronto

2:20 PM

Experiment and Modeling of the Two-peak Dynamic Behaviour of Additively Manufactured AlSi10Mg 200C: *Edward Cyr*¹; Amir Hadadzadeh¹; Babak Amirkhiz²; Mohsen Mohammadi¹; ¹University of New Brunswick; ²CanmetMATERIALS, Natural Resources Canada

2:40 PM

A Combinatorial Approach for Ni-base Superalloy Design via Direct Laser Metal Deposition: *Guru Dinda*¹; Abhishek Ramakrishnan¹; Husam Alrehaili¹; Ajay Bhagavatam¹; Aniket Dighe¹; Ajol Shah¹; Chaitanya Amilkanthwar¹; ¹Wayne State University

3:00 PM

Development of Titanium and Steel Alloys Optimized for AM: *Yining He*¹; Bryan Webler¹; Jack Beuth¹; ¹Carnegie Mellon University

3:20 PM Break**3:40 PM**

Multimaterial AM Structures with Controlled Thermal Expansion: *Nicholas Jones*¹; Maarten De Boer¹; Jack Beuth¹; Sneha Narra¹; ¹Carnegie Mellon University

4:00 PM

New Routes to Alloys and Research Parts Using Additive Manufacturing: *Daniel Hooks*¹; Thomas Lienert¹; Terry Holesinger¹; ¹Los Alamos National Lab

4:20 PM

Investigating the Effect of Surface Active Elements on the Microstructure of Laser Re-melted Steel: *Debomita Basu*¹; Jack Beuth¹; Bryan Webler¹; ¹Carnegie Mellon University

4:40 PM

Improving the Printability of Nickel Superalloys for Selective Laser Melting: *Yevgeni Brif*¹; Iain Todd¹; ¹University of Sheffield

5:00 PM

Isotropic Microstructure and Defect Tolerant Behavior by Microstructural Design of Additively Manufactured TRIP-steel: *Julia Richter*¹; Johannes Guenther¹; Florian Brenne¹; Matthias Droste²; Marco Wendler²; Olena Volkova²; Horst Biermann²; Thomas Niendorf¹; ¹University of Kassel; ²Freiberg University of Mining and Technology

Additive Manufacturing of Metals: Post Processing — Surface Post Processing I/ Heat Treatment III

Program Organizers: Ola Harrysson, North Carolina State University; Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; S. Babu, Indian Institute of Technology Madras

Wednesday PM
October 17, 2018

Room: A216
Location: Greater Columbus Convention Center

Session Chair: Christopher Rock, NC State University

2:00 PM Invited

Electrochemical Surface Finishing of Additively Manufactured Parts: *Timothy Hall*¹; Holly Garich¹; Stephen Snyder¹; EJ Taylor¹; ¹Faraday Technology Inc

2:40 PM

Static and Fatigue Strength of Laser Powder Bed Fused Ti-6Al-4V Treated with Different Post Processing Methods: *Thomas Toepfel*¹; Markus Oettel¹; Florian Bittner¹; Juliane Thielsch¹; ¹Fraunhofer IWU

3:00 PM

Surface Texture Anatomy of Additive Manufacturing Components and How to Improve Them: Towards the Perfect Surface Finishing Process: *Agustin Diaz*¹; ¹REM Surface Engineering

3:20 PM Break**3:40 PM**

Optimizing Hot-isostatic Pressing of Additively Manufactured Ti-6Al-4V for Fatigue Performance: *Kelvin Leung*¹; Anahita Imanian¹; Nicole Apetre¹; Peipei Li²; Derek Warner²; ¹Technical Data Analysis, Inc; ²Cornell University

4:00 PM

The Effect of Heat Treatment on the Microstructure of a LENS Titanium Aluminum Vanadium Alloy that is Functionally Graded with Boron: *Denver Seely*¹; Mark Horstemeyer¹; Hongjoo Rhee¹; ¹Mississippi State University



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COLUMBUS, OHIO, USA

4:20 PM

The Effects of Post Processing in Additively Manufactured 316L: *Richard Fonda*¹; David Rowenhorst¹; Scott Olig¹; Jerry Feng¹; Lily Nguyen²; Adelina Beckwith¹; Beth Stiles¹; ¹Naval Research Laboratory; ²National Research Council

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

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

Wednesday PM
October 17, 2018

Room: B230
Location: Greater Columbus Convention Center

Session Chairs: Markus Chmielus, University of Pittsburgh; Hamdy Ibrahim, University of Tennessee at Chattanooga; Ahmadreza Jahadakar, The University of Toledo

2:00 PM

Epitaxial Growth of Magnetic Shape-memory Alloys: Re-melting and Directed Energy Deposition of Ni-Mn-Ga: *Jakub Toman*¹; Peter Müllner²; Markus Chmielus¹; ¹University of Pittsburgh; ²Boise State University

2:20 PM

Improving the Mechanical Properties of FeGa through NbC Additions: Nicholas Jones¹; Suok-Min Na¹; *Paul Lambert*¹; ¹Naval Surface Warfare Center - Carderock

2:40 PM

Magnetostriction Measurements on Large-grained FeCo Samples: *Nicholas Jones*¹; Paul Lambert¹; Deborah Schlagel¹; Thomas Lograsso¹; ¹Naval Surface Warfare Center, Carderock Division

3:00 PM

Rapid Intense Pulsed Light Sintering of Silver Nanowire Networks as Transparent Conducting Electrodes on Polycarbonate: Experiments and Modeling: Michael Dexter¹; Zhongwei Gao²; Rajiv Malhotra¹; Chih-hung Chang²; *HyunJun Hwang*¹; ¹Rutgers University; ²Oregon State University

3:20 PM Break

3:40 PM

Synthesis of High Sn Concentration GeSn by Recrystallization of Amorphous Phase: *Masashi Higashiyama*¹; Manabu Ishimaru¹; Masayuki Okugawa²; Ryusuke Nakamura²; ¹Kyushu Institute of Technology; ²Osaka Prefecture University

4:00 PM

Microstructural Analysis of Oligocrystalline HIPed FeGa Rods: *Nicholas Jones*¹; Paul Lambert¹; ¹Naval Surface Warfare Center, Carderock Division

4:20 PM Invited

Achieving Favorable Microstructure and Properties in Additively Manufactured Ni-Mn-based Functional Magnetic Materials: *Markus Chmielus*¹; Erica Stevens¹; Katerina Kimes¹; Pierangeli Rodriguez¹; Amir Mostafaei¹; Jakub Toman¹; ¹University of Pittsburgh

Advanced Materials for Oil and Gas Applications - Performance and Degradation — Advanced Materials for Oil and Gas Applications - Performance and Degradation

Program Organizers: Yellapu Murty, MC Technologies LLC; Andrzej Wojcieszynski, ATI Specialty Materials; Riad Asfahani, US Steel

Wednesday PM
October 17, 2018

Room: B140/141
Location: Greater Columbus Convention Center

Session Chairs: Ronald Radzilowski, AK Steel; Riad Asfahani, US Steel

2:00 PM

Considerations and Guideline on Materials Selection and Qualification for HPHT Oil and Gas Applications: *Fei Tang*¹; ¹Dnv GI

2:30 PM

Inconel Alloy 725 and Variants for Use in High-temperature Environments: *Martin Detrois*¹; Kyle Rozman¹; Paul Jablonski¹; Jeffrey Hawk¹; ¹National Energy Technology Laboratory

3:00 PM

Study on the Interfacial Reaction of Secondary Reaction Zone during Cyclic Thermal Fatigue in Single Crystal Ni-base Superalloy: *Joong Eun Jung*¹; In Soo Kim¹; Baig Gyu Choi¹; Jeonghyeon Do¹; In-Yong Jung¹; Chang-Yong Jo¹; ¹Korea Institute of Materials Science (KIMS)

3:20 PM Break

3:40 PM

A Microstructural Approach to Understanding the Corrosion Behavior of Cu-Ni-Sn Alloys in Chlorine Environments: *Carole Trybus*¹; Sam Imanieh²; Robert Kusner³; Fritz Gensing¹; ¹Materion, Alloy Technology; ²Center for Materials and Sensor Characterization, University of Toledo; ³Materion, Technical Services

4:10 PM

A Cu-bearing Pipeline Steel for Microbial Corrosion Control: *Yiyin Shan*¹; Xianbo Shi¹; Wei Yan¹; ¹Institute of Metals Research

4:30 PM

Mitigation of Carbonaceous Deposit Formation on Structural Alloys via Surface Modification: Pralav Shetty¹; Runyu Zhang¹; Velu Subramani²; Paul Braun¹; *Jessica Krogstad*¹; ¹University of Illinois Urbana-Champaign; ²BP

5:00 PM

Development of a Standardized Test for Stress Relief Cracking Susceptibility in Low Alloy Steels: *Conner Sarich*¹; ¹The Ohio State University

Advanced Steel Metallurgy: Products and Processing — Dual Phase and Q&P Steels

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

Wednesday PM
October 17, 2018

Room: A226
Location: Greater Columbus Convention Center

Session Chairs: Charles Enloe, General Motors; Keith Taylor, SSAB

2:00 PM Invited

Processing Challenges of Dual Phase Steels: Hot Band Property Variation Caused by Rewetting on the Runout Table: *Erika Bellhouse*¹; Adam Silvestri¹; Eugen Ianos¹; ¹ArcelorMittal Dofasco

WEDNESDAY PM

2:30 PM

Production of Cold Rolled and Annealed DP-590 (Dual-phase) Steel through Continuous Galvanizing Line (CGL) of a Flex Mill at Big River Steel, USA: *Shobhit Bhartiya*¹; Amar De¹; Denis Hennessy¹; Matt Hill¹; Bilin Chen¹; Ricky Averion¹; ¹Big River Steel LLC

2:50 PM

Processing, Microstructures and Properties of Ultra-high Strength, Low Carbon and V-bearing Dual-phase Steels Produced on Continuous Galvanizing Lines: *Yingjie Wu*¹; Anthony Deardo¹; ¹University of Pittsburgh

3:10 PM

Advanced Characterization of Microstructures in Ultra High Strength Dual Phase Steel: *Jason Andring*¹; ¹University of Pittsburgh

3:30 PM Break

3:50 PM

The Influence of Chemistry on the Microstructure and Mechanical Property of DP980: *Mingsheng Xia*¹; ChunYu Liu¹; Yunge Wang¹; Binquan Ai¹; ¹HBIS Tangsteel

4:10 PM

Role of Processing Parameters in Q&P Steels: Experimental Analysis and Thermodynamic Modeling: *Amit Behera*¹; Gregory Olson¹; ¹Northwestern University

4:30 PM

Quenching, Partitioning and Tempering of Experimental Steel: *Aqil Inam*¹; *Muhammad Hassan*¹; Muhammad Ishtiaq¹; Tariq Hussain¹; ¹University of the Punjab

Advances in Solid Oxide Fuel Cell Technology — SOFCs for Military Applications

Program Organizers: Scott Swartz, Nexceris LLC; Matthew Seabaugh, Nexceris LLC; Jeff Stevenson, Pacific Northwest National Laboratory

Wednesday PM
October 17, 2018

Room: D281
Location: Greater Columbus Convention Center

Session Chairs: Scott Swartz, Nexceris LLC; Gene Arkenberg, Nexceris, LLC

2:00 PM Invited

Solid Oxide Fuel Cells for Long Endurance Unmanned Aerial Systems, an Air Force Perspective: *Michael Rottmayer*¹; Thomas Howell¹; ¹AFRL/RQOE

2:20 PM Invited

Solid Oxide Fuel Cell System Applications and Requirements from the Army's Perspective: *Theodore Burye*¹; Kevin Centeck¹; ¹Tank Automotive Research Development and Engineering Center (TARDEC)

2:40 PM Invited

Portable Solid Oxide Fuel Cell Systems for Military and Aerospace Applications: *Tom Westrich*¹; ¹USSI

3:00 PM Invited

Paradigm Shifts in Materials to Enable Breakthrough Fuel Cell Systems: *Comas Haynes*¹; ¹GTRI

3:20 PM Break

3:40 PM Invited

Considerations for Standalone Diesel/Jet-fueled Fuel Cell Generators: *Subir Roychoudhury*¹; Christian Junaedi¹; Saurabh Vilekar¹; Tim LaBreche¹; ¹Precision Combustion, Inc.

4:00 PM Invited

Power and Energy Solutions for Remote Off-grid Applications: *Praveen Cheekatamarla*¹; ¹Atrex Energy Inc

4:20 PM Invited

Update on Nexceris' SOFC stack technology: *Gene Arkenberg*¹; Scott Swartz¹; David Kopechek¹; Chad Sellers¹; ¹Nexceris, LLC

4:40 PM Invited

Novel Titanate-based Electrodes for Solid Oxide Fuel Cells with Improved Performance and Stability: *Scott Barnett*¹; Shan-Lin Zhang¹; Liliana Moggi²; ¹Northwestern University; ²Centro Atomico Bariloche

Advances in Surface Engineering — Tribology/Tribocorrosion, Surface Stresses, and Surface Microstructure

Program Organizers: Brian Skinn, Faraday Technology, Inc.; Timothy Hall, Faraday Technology, Inc.; Sandip Harimkar, Oklahoma State University; Michael Roach, University of Mississippi Medical Center; Rajeev Gupta, The University of Akron

Wednesday PM
October 17, 2018

Room: B144/145
Location: Greater Columbus Convention Center

Session Chair: Jing Xu, Faraday Technology, Inc.

2:00 PM Invited

Development of Functional Multi-layered Coatings Using Cathodic Arc Physical Vapor Deposition (CAPVD) Technique: *G Sundararajan*¹; Krishna Valleti¹; D Srinivasa Rao¹; ¹International Advanced Research Centre for New Materials (ARCI), Hyderabad

2:40 PM Invited

Synergistic Role of Carbonaceous Reinforcements on Multi Length Scale Tribology of Electrophoretically Deposited Nickel-boron Nitride Coatings: *Shikha Awasthi*¹; Chandra Pandey²; *Kantesh Balani*³; ¹Indian Institute of Technology Kanpur; ²Babu Banarasi Das University; ³Indian Institute of Technology Kanpur

3:20 PM Break

3:40 PM

Laser Assisted Synthesis of High Entropy Alloy Coating on Aluminum: Tribocorrosion Behavior: *Sameehan Joshi*¹; Gaurav Argade¹; Aditya Ayyagari¹; Sundeep Mukherjee¹; Narendra Dahotre¹; ¹University of North Texas

4:00 PM

Use of Advanced Regression Techniques to Explain Variance in Stress Concentrations Due to Rough Surfaces: *Christopher Kantzos*¹; Anthony Rollett¹; ¹Carnegie Mellon University

4:20 PM

Microstructural Evolution during Laser Surface Treatment of Biocompatible AZ31B Mg Alloy: *Mangesh Pantawane*¹; Sameehan Joshi¹; Yee-Hsien Ho¹; Tso-Chang Wu¹; Narendra Dahotre¹; ¹University of North Texas

4:40 PM

Investigation on Multiple Parametric Optimization of Cold Sprayed Coatings Process: *Tarun Goyal*¹; ¹IKG Punjab Technical University

5:00 PM

The Methodological Principles of the Engineering of Tribocoupling Details Surface under Multicomponent Loading: *Volodymyr Tsyganov*¹; Leonid Ivschenko¹; ¹Zaporizhy National Technical University



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COLUMBUS, OHIO, USA

5:20 PM

A Novel Laser Shock Surface Patterning Process Towards Tribology Applications: *Bo Mao*¹; Arpith Siddaiah¹; Pradeep Menezes¹; Yiliang Liao¹; ¹University of Nevada, Reno

Art and Cultural Heritage: Reverse Engineering — Art and Cultural Heritage: Reverse Engineering II

Program Organizers: Glenn Gates, Walters Art Museum; John McCloy, Washington State University

Wednesday PM
October 17, 2018

Room: B232
Location: Greater Columbus Convention Center

Session Chair: Glenn Gates, Walters Art Museum

2:00 PM Invited

Experimental Confirmation of Rock Melting in Iron Age Swedish Vitrified Hillfort: *John McCloy*¹; Jose Marcial¹; Mahmood Abusamha¹; Carolyn Pearce²; Michael Schweiger²; Jarrod Crum²; Connor Appel²; Jack Clare³; Jamie Weaver⁴; Rolf Sjöblom⁵; Erik Ogenhall⁶; Eva Hjärthner-Holdar⁶; Mia Englund⁶; Albert Kruger⁷; ¹Washington State University; ²Pacific Northwest National Laboratory; ³University of Sheffield; ⁴National Institute of Standards & Technology; ⁵Luleå University of Technology; ⁶Arkeologerna; ⁷Department of Energy - Office of River Protection

2:40 PM Invited

Sifting the Past From Over a 1000 Years of Alteration: *Jamie Weaver*¹; Rolf Sjöblom²; Carolyn Pearce³; Joseph Ryan³; Edgar Buck³; John McCloy⁴; David Peeler³; ¹National Institute of Standards and Technology; ²Luleå University of Technology; ³Pacific Northwest National Laboratory; ⁴Washington State University

3:20 PM Break

3:40 PM Invited

Principles of Roman Cementitious Systems in Architectural and Marine Concretes: *Marie Jackson*¹; Juhyuk Moon²; Heng Chen³; Yi Zhang⁴; ¹University of Utah; ²Seoul National University; ³Southeast University; ⁴National University of Singapore

4:20 PM

Using Trace Element Ratios to Establish Provenance of Brick and Terra Cotta: *Emily Steiner*¹; Pippa Merrick²; Susan Tunick³; Kathryn Tierney⁴; Hyojin Lee¹; William Carty¹; ¹New York State College of Ceramics at Alfred University; ²Historical Hillsborough Research Group; ³Friends of Terra Cotta; ⁴Boston Valley Terra Cotta

4:40 PM Invited

Deriving History from Isolated Late Classic Maya Ceramic Vessels: *Ronald Bishop*¹; ¹NMNH-Smithsonian Institution

5:20 PM Invited

Analysis of Inorganic Pigments in Unknown Paintings by Painter Fernando Fader through X-ray Fluorescence (XRF): *Patricia Carrizo*¹; Cristian Aguilera¹; Julio Ortigala¹; ¹Universidad Tecnológica Nacional Regional Mendoza(UTNFRM)

Bulk Metallic Glass Matrix Composites - Challenges and Triumphs — Mechanical Properties and Structure-property Relation

Program Organizers: Muhammad Rafique, RMIT University; Weidong Li, The University of Tennessee; Junwei Qiao, Taiyuan University of Technology; Gang Wang, Shanghai University

Wednesday PM
October 17, 2018

Room: B244/245
Location: Greater Columbus Convention Center

Session Chairs: Peter Liaw, The University of Tennessee; Christopher Schuh, Massachusetts Institute of Technology

2:00 PM Invited

Broadband Nanoindentation Creep of Plastic Deformation in in Zr50Cu45Al5 Metallic Glass: *Donald Stone*¹; Joseph Jakes²; Zenon Melgarejo¹; ¹University of Wisconsin-Madison; ²USDA Forest Products Laboratory

2:30 PM Invited

Enhanced Shear Stability of a Metallic Glass at Cryogenic Temperature: *Gang Wang*¹; ¹Shanghai University

3:00 PM

Quantifying the Mechanisms of Strain Delocalization in Metallic Glass Matrix Composites through Nanoindentation: *Jonathan Gentile*¹; Douglas Stauffer²; Jason Trelewicz¹; ¹Stony Brook University; ²Bruker Nano, Inc.

3:20 PM Break

3:40 PM Invited

Strain Delocalization and Fracture Behaviors of Laminated Metallic Glass Composites: *Xinghang Zhang*¹; Zhe Fan²; Jian Wang³; ¹Purdue University; ²Oak Ridge National Lab; ³University of Nebraska, Lincoln

4:10 PM

Correlating Nanoscale Structure to Properties of Metallic Glasses and Composites: *Soo Hyun Im*¹; Pengyang Zhao¹; Geun Hee Yoo²; Eun Soo Park²; Yunzhi Wang¹; Jinwoo Hwang¹; ¹Ohio State University; ²Seoul National University

4:30 PM

Universally Scaling Hall-petch-like Relationship in Metallic Glass Matrix Composites: *Jiaojiao Li*¹; Yuyang Liu¹; Peter Liaw²; Jürgen Eckert³; Junwei Qiao¹; ¹Taiyuan University of Technology; ²The University of Tennessee; ³Montanuniversität Leoben

4:50 PM

The Effects of Cryogenic Treatment on Metallic Glasses: *Nizhen Zhang*¹; Qing Wang¹; ¹Shanghai University

5:10 PM

Defects Evolution in an Irradiated Metallic Glass: *Kang Sun*¹; Gang Wang¹; ¹Shanghai University

WEDNESDAY PM

Ceramics and Glasses Simulations and Informatics — Multiscale Modeling of Materials

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; Efrain Hernandez-Rivera, U.S. Army Research Laboratory

Wednesday PM
October 17, 2018

Room: A113
Location: Greater Columbus Convention Center

Session Chairs: Rampi Ramprasad, Georgia Institute of Technology; Jincheng Du, University of North Texas

2:00 PM Invited

Using Advanced Simulation Techniques to Understand Vapor Deposited Glass Formation and Melting: *Elijah Flenner*¹; Patrick Charbonneau²; Ludovic Berthier³; Francesco Zamponi⁴; ¹Colorado State University; ²Duke University; ³Laboratoire Charles Coulomb, University de Montpellier and CNRS; ⁴Laboratoire de Physique Theorique, Ecole Normale Supérieure, PSL Research University, Sorbonne Universités, UPMC Universités Paris 06, CNRS

2:30 PM Invited

Phase-field Simulation of Pressure-induced and Light-controlled Ferroelectric Switching in Nanoscale Thin Film: *Ye Cao*¹; ¹University of Texas at Arlington

3:00 PM

Ab-initio Estimation and Experimental Measurement of the Fracture Surface Energy and Toughness of Glass: Theany To¹; Fabrice Célarié¹; *Tanguy Rouxel*¹; ¹University of Rennes 1

3:20 PM Break**3:40 PM Invited**

Modeling Anisotropic Grain Growth with the SPPARKS Framework: *Efrain Hernandez-Rivera*¹; Philip Goins¹; ¹US Army Research Laboratory

4:10 PM Invited

Fracture Mechanics of Phase-separated Glasses by Peridynamics Simulations: Longwen Tang¹; N. M. Anoop Krishnan²; *Mathieu Bauchy*¹; ¹University of California, Los Angeles; ²IIT Delhi

4:40 PM

Molecular Dynamics Study on SiO₂ Interfaces as Non-fire Solids: *Tomohiro Sato*¹; Ken-ichi Saitoh¹; Masayoshi Fujii²; Chika Takai²; Hadi Razavi²; Masanori Takuma¹; Yoshimasa Takahashi¹; ¹Kansai University; ²Nagoya Institute of Technology

5:00 PM

Computational Studies of ²⁹Si NMR in Crystalline and Amorphous Silicon Nitrides: *Iliia Ponomarev*¹; Peter Kroll¹; ¹The University of Texas at Arlington

Characterization & Methods in Failure Analysis — Corrosion

Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

Wednesday PM
October 17, 2018

Room: A211
Location: Greater Columbus Convention Center

Session Chairs: Veronique Vitry, UMONS; Courtney Pape, DNV GL; Thomas Traubert, EDT Engineering; Aaron Tanzer, Element Materials Technology; Jake Auliff, DANFOSS

2:00 PM

Case Histories of Some Failures of Fittings and Tanks in the Petroleum Industry: *Barry Hindin*¹; ¹Kiefner & Assoc

2:20 PM Invited

Characterization of Copper Tubing and Pipe Ruptures: *G. Maltry*¹; ¹Engineering Design & Testing

2:40 PM

Case Study of Internal Corrosion Mechanisms in Pipelines: *Courtney Pape*¹; ¹DNV GL

3:00 PM

Corrosion of 304 Stainless Steel Pneumatic Pressure Tubes: *Dana Medlin*¹; Donald Johnson²; ¹SEAL Laboratories (EAG Inc.); ²University of Nebraska-Lincoln

3:20 PM Break**3:40 PM**

External Stress Corrosion Cracking Under Mineral Wool Insulation on a Carbon Steel Pipeline: *Dave Norfleet*¹; Barbara Padgett¹; Kevin Ralston¹; John Beavers¹; Liu Cao¹; Burke Delanty¹; ¹DNV GL

4:00 PM

Failure of Galvanized Steel Water Pipes: It's Not Always What You Think: *Véronique Vitry*¹; Fabienne Delaunois¹; ¹UMONS

4:20 PM

Grooving Corrosion: Differentiating Weld Defects from Corrosion Failure: *Vir Nirankari*¹; Brad James¹; Ockert Van Der Schijff¹; ¹Exponent, Inc

4:40 PM

Failure Analysis of Corroded Cooling Deck Pan: *Adam Boesenberg*¹; ¹Iowa State University

5:00 PM

Effect of Ni to Cu Ratio on Formation of Oxide Scale at High Temperature: *Shrikant Jadhav*¹; ¹Kalyani Center for Technology and Innovation



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GREATER COLUMBUS CONVENTION CENTER

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Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Session IV

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

Wednesday PM
October 17, 2018
Room: D180
Location: Greater Columbus Convention Center

Funding Support provided by: MilliporeSigma

Session Chairs: Kathy Lu, Virginia Tech; Jian Shi, Rensselaer Polytechnic Institute

2:00 PM Invited

Particle ALD for Sintering Yttria-stabilized Cubic Zirconia (YSZ): Rebecca O'Toole¹; Christopher Bartel¹; Maila Kodas¹; Alexa Horrell¹; Sandrine Ricote²; Neal Sullivan²; Robert Hall³; Charles Musgrave¹; *Alan Weimer*¹; ¹University of Colorado; ²Colorado School of Mines; ³ALD NanoSolutions

2:30 PM

Reduced Thermal Conductivity in 7 wt% Yttria Doped Zirconia Nanocrystalline Ceramics: John Drazin¹; *Edward Gorzkowski*²; ¹ASEE; ²Naval Research Laboratory

2:50 PM

Particle Size Dependence of Growth and Growth Mode of Atomic Layer Deposition in a Rotary Reactor: *James Wollmershauser*¹; Kedar Manandhar²; Boris Feigelson¹; ¹U.S. Naval Research Laboratory; ²American Society for Engineering Education Postdoctoral Research Fellow sited at U.S. Naval Research Laboratory

3:10 PM Invited

Synthesis of Nanostructured Ferrioc Materials for Energy Conversion: *Todd Monson*¹; Baolong Zheng²; Tyler Stevens¹; Renee Van Ginhoven³; David Vargas¹; Yizhang Zhou²; Enrique Lavernia²; ¹Sandia National Labs; ²University of California, Irvine; ³Air Force Research Lab

3:40 PM Break

4:00 PM Invited

Engineering Iron Oxide Nanoparticles for Optimal Magnetic Hyperthermia Performance: *Anna Cristina Samia*¹; ¹Case Western Reserve University

4:30 PM

Optically Transparent (Fully Dense) Nanocrystalline Ceramics Manufactured via CIP-sinter-HIP Processing: John Drazin¹; *Edward Gorzkowski*²; James Wollmershauser²; ¹ASEE ; ²Naval Research Laboratory

4:50 PM

Negative Hall-Petch Relationship and Plateau in Nanocrystalline Ceramics: *Heonjune Ryou*¹; John Drazin¹; Kathryn Wahl²; Syed Qadri²; Edward Gorzkowski²; Boris Feigelson²; James Wollmershauser²; ¹American Society for Engineering Education Postdoctoral Research Fellow sited at U.S. Naval Research Laboratory; ²U.S. Naval Research Laboratory

Covetic Nanomaterials for Energy Applications — Covetic Materials II

Program Organizers: David Forrest, US Department of Energy; Uthamalingam Balachandran, Argonne National Laboratory

Wednesday PM
October 17, 2018
Room: D282
Location: Greater Columbus Convention Center

Session Chair: David Forrest, U.S. Department of Energy

2:00 PM Invited

Development of Covetic Materials for Energy Applications: *Uthamalingam Balachandran*¹; Beihai Ma¹; Stephen Dorris¹; Tae Lee¹; Jie Wang²; Jianguo Wen²; Paul Jablonski³; David Forrest⁴; ¹Argonne National Laboratory Energy Systems Division; ²Argonne National Laboratory; ³National Energy Technology Laboratory; ⁴U.S. Dept. of Energy

2:40 PM

Processing Cu-covetic Materials in a Controlled Atmosphere: *Steve Dorris*¹; U. (Balu) Balachandran¹; B. Ma¹; T. H. Lee¹; P. D. Jablonski²; ¹Argonne National Laboratory; ²National Energy Technology Laboratory

3:00 PM

Overview on Copper Covetic Materials: *Iwona Jasiuk*¹; Sabrina Nilufar¹; Gabriela Couvertier-Santos¹; Sakshi Braroo¹; ¹University of Illinois

3:20 PM Break

3:40 PM

Microstructural Characterization of Covetic Nanomaterials: *Beihai Ma*¹; U. (Balu) Balachandran¹; Stephen Dorris¹; Tae Lee¹; Jie Wang¹; Jianguo Wen¹; Adam Rondinone²; ¹Argonne National Laboratory; ²Oak Ridge National Laboratory

4:00 PM

Two Step Synthesis and Properties of Cobalt Covetics: *Zafer Turgut*¹; Gregory Kozlowski²; Michael Susner³; Michael McLeod⁴; John Horwath¹; ¹AFRL/RQQM; ²Wright State University; ³UES Inc.; ⁴UDRI

4:20 PM Concluding Comments

Deformation and Transitions at Grain Boundaries VI — Grain Boundary Energy and Structure II

Program Organizers: Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Saryu Fensin, Los Alamos National Laboratory; Jian Luo, University of California San Diego; Douglas Spearot, University of Florida

Wednesday PM
October 17, 2018
Room: A123
Location: Greater Columbus Convention Center

Session Chairs: Kiran Solanki, Arizona State University; Fadi Abdeljawad, Sandia National Laboratories

2:00 PM Invited

Stiffness Matters: The Role of the Interface Stiffness Tensor on Grain Boundary Dynamical Processes: *Fadi Abdeljawad*¹; Stephen Foiles²; Khalid Hattar²; Brad Boyce²; ¹Clemson University; ²Sandia National Laboratories

WEDNESDAY PM

2:30 PM

Structure and Properties of bcc Mg Synthesized Using Interface Strain Engineering: *Siddhartha Pathak*¹; Manish Jain¹; Marko Knezevic²; Irene Beyerlein³; ¹Univ of Nevada, Reno; ²University of New Hampshire; ³University of California, Santa Barbara

2:50 PM Invited

Towards Controlling Grain Boundary Stability through Ion Beam Modification: *Khalid Hattar*¹; Christopher Barr¹; Samuel Briggs¹; Brittany Muntiferung¹; Daniel Bufford¹; Caitlin Taylor¹; Nan Li²; Aman Haque³; ¹Sandia National Laboratories; ²Los Alamos National Laboratory; ³Pennsylvania State University

3:10 PM Invited

Revealing the Role of Grain Boundary Structures on Magnetic Flux Trapping Behavior in Niobium: A First-principles Study: *P. Grag*¹; T Bieler²; Kiran Solanki¹; ¹Arizona State University; ²Michigan State University

3:30 PM Break**3:50 PM**

ECCI Characterization of Dislocation Evolution near Grain Boundaries and Its Effect on the Superconducting Properties of Niobium for SRF Cavities: *Mingmin Wang*¹; Shreyas Balachandran²; Santosh Chetri²; Anatolii Polyanski²; Peter Lee²; Christopher Compton³; Thomas Bieler¹; ¹Michigan State University; ²National High Magnetic Field Laboratory; ³Facility for Rare Isotope Beams

4:20 PM

On The Influence of Thermo-mechanical Process History on Stress Corrosion Cracking of Solution Annealed Type 304 Stainless Steel: *Osama Alyousif*¹; ¹Kuwait University

Eco-Friendly and Sustainable Ceramics — Novel Waste-derived Cellular Materials

Program Organizers: Enrico Bernardo, University of Padova; Henry Colorado, Universidad De Antioquia; Ivo Dlouhy, Institute of Physics of Materials, Academy of Sciences of the Czech Republic; Aldo Boccaccini, University of Erlangen-Nuremberg; Antonio Pedro Oliveira, Federal University of Santa Catarina; Isabella Lancellotti, Università di Modena e Reggio Emilia; Alexander Karamanov, Bulgarian Academy of Sciences Institute of Physical Chemistry "Rostislav Kaischew"; Vilma Ducman, Slovenian National Building and Civil Engineering Institute

Wednesday PM
October 17, 2018

Room: A114
Location: Greater Columbus Convention Center

Session Chairs: Isabella Lancellotti, University of Modena and Reggio Emilia; Yiannis Pontikes, KU Leuven

2:00 PM Invited

From Waste CRT Glasses to Foam Glass: A Case of Study to Re-use Electric and Electronic End of Life Materials: *Francois Mear*¹; ¹Lille University

2:30 PM Invited

Glassy Foams from Recycling: Some Examples of Study and Applications: *Ronan Lebullenger*¹; ¹University of Rennes

3:00 PM Invited

Production of Hollow Glass Microspheres from Waste Glasses by Flame Synthesis with Na₂SO₄ Blowing Agent: *Jozef Kraxner*¹; Dušan Galusek¹; ¹FunGlass – Centre for Functional and Surface Functionalized Glass

3:20 PM Break**3:40 PM**

High Strength Cellular Glass-ceramics from Glass By-products of Metal Extraction Processes Applied on MSWI Bottom Ash: *Patricia Rabelo Monich*¹; Hugo Lucas²; Bernd Friedrich²; Enrico Bernardo¹; ¹University of Padova; ²RWTH Aachen

4:00 PM

Upcycling of Vitreous By-product of the Plasma Heating of MSW into Multifunctional Porous Glass-ceramics: *Patricia Rabelo Monich*¹; Daniele Desideri¹; Enrico Bernardo¹; ¹University of Padova

Environmental Degradation and Embrittlement of Structural Metals — Hydrogen Embrittlement II

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

Wednesday PM
October 17, 2018

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

Session Chair: Sriraman Rajagopalan, McGill University

2:00 PM Invited

Role of Grain Boundaries in Hydrogen Diffusion in Metals: Fast or Slow?: *Jun Song*¹; Xiao Zhou¹; ¹McGill University

2:30 PM

A Novel Approach to Assess Material Susceptibility to Hydrogen Embrittlement (HE) Using Finite Element Analyses (FEA): *Tuhin Das*¹; Esaie Legrand²; Salim Brahimi³; Jun Song¹; Stephen Yue¹; ¹Department of Mining and Materials Engineering, McGill University; ²Laboratoire des Sciences de l'Ingénieur pour l'Environnement, LaSIE, Bat. Marie Curie, Av. Michel Crepeau; ³IBECA Technologies Corp

2:50 PM Invited

Fracture Mechanics Analysis of a High Strength Hydrogen Embrittlement L43 BOP Connector Bolt Failure: *Herman Amaya*¹; Bryan Fahimi¹; Ramgopal Thodla²; ¹Schlumberger; ²DNVGL USA, Inc

3:20 PM Break**3:50 PM**

Microstructural Variation at Different Layers of API 5L X80 Pipeline Steel Thickness and Its Relation to Hydrogen Degradation: *Enyinnaya Ohaeri*¹; Jerzy Szpunar; ¹University of Saskatchewan

4:10 PM Invited

Hydrogen Embrittlement of High Strength Alloys: Understanding the Similarities and Differences: Xu Lu¹; Dong Wang¹; Di Wan¹; Mohammad Ahmadzadeh¹; Afrooz Barnoush¹; ¹Norwegian University of Science and Technology



OCTOBER 14 – 18, 2018
 GREATER COLUMBUS CONVENTION CENTER
 COLUMBUS, OHIO, USA

Fast/Ultrafast Characterization of Irreversible Transformations in Materials with X-rays and Electrons — Synchrotron X-ray and XFEL Imaging

Program Organizers: Tian Li, Lawrence Livermore National Laboratory; Tao Sun, Argonne National Laboratory; Anders Madsen, European XFEL

Wednesday PM Room: B246
 October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Tao Sun, Argonne National Laboratory

2:00 PM Invited
Visualization and Measurement with Dynamic X-ray Radiography of Laser Melting in 3D Printing: *Anthony Rollett*¹; Ross Cunningham¹; Tao Sun²; Christopher Kantzos¹; Cang Zhao²; ¹Carnegie Mellon University; ²Argonne National Laboratory

2:30 PM Invited
Characterizing the Dynamics of Melting and Solidification in Laser Powder Bed Fusion Additive Manufacturing Process by High-speed X-ray Imaging and Diffraction: Lianghua Xiong¹; Niranjan Parab²; Qilin Guo¹; Tao Sun²; *Lianyi Chen*¹; ¹Missouri S&T; ²Argonne National Laboratory

3:00 PM
Investigation of Dynamic Fracture Behavior of Additively Manufactured Al-10Si-Mg Using High-speed Synchrotron X-ray Imaging: *Niranjan Parab*¹; Lianghua Xiong²; Cang Zhao¹; Yizhou Nie³; Cody Kirk³; Zherui Guo³; Xianghui Xiao¹; Weinong Chen³; Lianyi Chen²; Tao Sun¹; ¹Argonne National Laboratory; ²Missouri University of Science and Technology; ³Purdue University

3:20 PM Break

3:40 PM Invited
Tracking of Stochastic Processes with Full Field Hard X-ray MHz Rate Single Pulse Imaging: *Patrik Vagovic*¹; Tokushi Sato¹; Rita Graceffa²; Pablo Villanueva-Perez¹; Ladislav Mikes²; Christian David³; Margie Olbinado⁴; Alexander Rack⁴; Andrej Hovan⁵; Jozef Ulicny⁵; Marcin Sikorsky²; Henry Chapman¹; Alke Meents¹; Joachim Schulz²; Thomas Tschentscher²; Adrian Mancuso²; ¹CFEL, DESY; ²European XFEL; ³PSI; ⁴ESRF; ⁵Safarik University

4:00 PM
Ultrafast Sstructural Behavior in Shock-compressed Iron Probed Using XFEL: *Tomokazu Sano*¹; ¹Osaka University

4:20 PM Invited
Dynamic X-ray Characterization of Reactive Materials: *Emre Gunduz*¹; ¹Purdue University

From Diversity to Inclusion — Session II
Program Organizers: Elvi Dalgaard, Pratt & Whitney Canada; Lynnette Madsen, Svedberg Science, Inc.

Wednesday PM Room: B231
 October 17, 2018 Location: Greater Columbus Convention Center

2:00 PM Invited
Diversity & Inclusion: Everyone Has a Responsibility: *Lana Eagle*¹; ¹Industry Council for Aboriginal Business (ICAB)

2:30 PM Invited
Observations, Learnings and Outlooks from the 3rd TMS Summit on Diversity: *Jonathan Madison*¹; Jennifer Andrew²; Megan Brewster³; Amy Clarke⁴; Kristen Constant⁵; Oscar Dubon⁶; Emily Kinser⁷; Matthew Korey⁸; Natalie Larson⁹; Michael Rawlings¹⁰; Rosa Rojas¹¹; ¹Sandia National Laboratories; ²University of Florida; ³Launch Forth; ⁴Colorado School of Mines; ⁵Iowa State University; ⁶University of California, Berkeley; ⁷IBM; ⁸Purdue University; ⁹University of California, Santa Barbara; ¹⁰NSF; ¹¹University of Arizona

3:00 PM
Bring Your Whole Self to Work: *Raul Rebak*¹; ¹GE Global Research

3:20 PM Break

3:40 PM Invited
Raising Awareness of the Existing Diversity and Inspiring the Next Generation: *Lynnette Madsen*¹; ¹Svedberg Science, Inc.

4:00 PM Panel: Diversity and Inclusion at MS&T and Beyond

5:00 PM Cocktail Reception

Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology — Glass Formation, Relaxation, and Crystallization

Program Organizers: John Kieffer, University of Michigan; Liping Huang, Rensselaer Polytechnic Institute

Wednesday PM Room: A115
 October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited
Surface Relaxation of Glasses: Its Effects on Fibers and Thin Films: *Minoru Tomozawa*¹; ¹Rensselaer Polytechnic Institute

2:30 PM Invited
Statistical Mechanical Modeling of Fluctuations in Glass-forming Systems: *John Mauro*¹; ¹The Pennsylvania State University

3:00 PM
On the Prony Series Representation of Stretched Exponential Relaxation: *John Mauro*¹; Yihong Mauro¹; ¹The Pennsylvania State University

3:20 PM Break

3:40 PM
Thermal History-insensitive Glasses: *Alexandra Mitchell*¹; Timothy Gross¹; ¹Corning

4:00 PM
Viscosities, Activation Energies, and Working Region Predictions for Bismuth Aluminoborosilicate Glasses: *Levi Gardner*¹; Michael Simpson¹; Krista Carlson¹; ¹University of Utah

4:20 PM
Crystallization Kinetics of Amorphous Semiconductors and Phase Change Material Thin Films Studied with Nanosecond-scale Dynamic TEM: Thaddeus Rahn¹; Al Rise¹; Victoria Bird¹; Mark Winseck¹; Huai-Yu Cheng²; Simone Raoux³; Geoffrey Campbell⁴; *Melissa Santala*¹; ¹Oregon State University; ²IBM/Macronix; ³Helmholtz-Zentrum Berlin für Materialien und Energie; ⁴Lawrence Livermore National Laboratory

WEDNESDAY PM

4:40 PM

Growth of Gold Nanoparticle Inside Glass Matrix: *Anahit Hovhannisyani¹*; Liping Huang¹; ¹Rensselaer Polytechnic Institute

IMS Symposium on Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties — Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties III

Program Organizers: Daniel Dennies, DMS, Inc.; James Martinez, NASA Johnson Space Center; Michael Keeble, Buehler, A Division of ITW; Jaret Frafjord, IMR Test Labs - Portland

Wednesday PM
October 17, 2018

Room: A212
Location: Greater Columbus Convention Center

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

2:00 PM

Effects of Aging Treatment on the Microstructure and Hardness of Pb-free Solder Alloys: *Carina Morando¹*; Osvaldo Fornaro¹; ¹IFIMAT-CIFICEN-UNCPBA-CONICET

2:20 PM

Characterization of a Thermomechanically Processed Mg-Li-Al Ultralight Alloy: Microstructure and Properties: *Rezawana Islam¹*; A Hadadzadeh²; Mary Wells³; Meysam Haghshenas¹; ¹University of North Dakota; ²University of Waterloo; ³University of Guelph

2:40 PM

Assessing the Impact of Image Acquisition and Processing Methods on Three-dimensional Microstructural Reconstructions: *Thomas Ivanoff¹*; Jonathan Madison¹; Joshua Koepke¹; Bradley Jared¹; ¹Sandia National Laboratories

3:00 PM

Computer Vision and Transfer Learning: A Multi-scale Approach to Quantify Microstructure for Correlation to Mechanical Properties: *Andrew Kitahara¹*; Elizabeth Holm¹; ¹Carnegie Mellon University

3:20 PM Break

3:40 PM

Composite Overwrapped Pressure Vessel (COPV) Life Test: *Richard Russell¹*; Jacob Hochhalter²; David Dawicke²; ¹NASA Ksc; ²NASA LaRC

4:00 PM

The Effect of Heat Treatment on Precipitation and Recrystallization Behavior of Selective Laser Melted Inconel 718: *Runbo Jiang¹*; Joseph Pauza¹; Anthony Rollett¹; ¹Carnegie Mellon University

4:20 PM

Microstructure Quantification and Reduced Order Crystal Plasticity Modelling Using a Machine Learning Approach: *Mengfei Yuan¹*; Stephen Niezgod¹; ¹The Ohio State University

4:40 PM

The Effect of Tool Rotational Speed on the Mechanical Properties of Friction Stir Welding of Steel: *Monatadhar Al-moussawi¹*; Alan Smith²; ¹Al-Furat Al-Awsat Technical University; ²Sheffield Hallam University

5:00 PM

A Dislocation Density-based Model for Deformation of a 3D Printed Silver Micro-pillars: *Mehdi Hamid¹*; Mohammad Sadeq Saleh²; Rahul Panat²; Hussein Zbib¹; ¹Washington State University; ²Carnegie Mellon University

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

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

Wednesday PM
October 17, 2018

Room: A122
Location: Greater Columbus Convention Center

Session Chair: Amanda Krause, Lehigh University

2:00 PM Invited

Thermodynamics and Kinetics of Layering Transitions at Grain Boundaries: *Jeffrey Rickman¹*; Martin Harmer¹; Helen Chan¹; ¹Lehigh University

2:30 PM Invited

Computing Grain Boundary Diagrams: From Phenomenological Thermodynamic Models to Atomistic Simulations: Chongze Hu¹; Shengfeng Yang²; *Jian Luo¹*; ¹Univ of California San Diego; ²UCSD/IUPUI

3:00 PM Invited

Ab Initio Modeling of Two-dimensional Interfaces and Surfaces: *Maytal Caspary Toroker¹*; ¹Technion - Israel Institute of Technology

3:30 PM

Sintering Kinetics in Direct Ink Write Processes: Atomistic and Mesoscopic Modeling Perspectives: *Fadi Abdeljawad¹*; Jesse Sestito²; Yan Wang²; Allen Roach¹; ¹Sandia National Laboratories; ²Georgia Institute of Technology

3:50 PM Break

4:10 PM

Atomistic Simulation of Field Evaporation from Field Emitter Tips: *Christian Oberdorfer¹*; Travis Withrow¹; Iman Ghamarian²; Emmanuelle Marquis²; Wolfgang Windl¹; ¹Ohio State Univ; ²University of Michigan

4:30 PM

Atomistic Study of Helium Effects in Nickel: *Edmanuel Torres¹*; Jeremy Pencer¹; Lori Walters¹; ¹Canadian Nuclear Laboratories

4:50 PM

Coarsening Statistics in an Iron Polycrystal and Advances in Grain Boundary Energy Extraction: *Yu-Feng Shen¹*; Xiaoting Zhong¹; Aditi Bhattacharya¹; He Liu¹; Gregory Rohrer¹; Robert Suter¹; ¹Carnegie Mellon University

5:10 PM

Ab-initio Characterization of Organic Functionalized Titania Membranes: *Evan Hyde¹*; Matthew Beck¹; ¹University of Kentucky

5:30 PM

Insights into the Structure and Energetics of Interfaces Between Iron and Cementite from Atomistic and Continuum Modeling: *Christopher Weinberger¹*; Matthew Guzewski¹; Shawn Coleman²; ¹Colorado State University; ²Army Research Laboratory



OCTOBER 14 – 18, 2018
 GREATER COLUMBUS CONVENTION CENTER
 COLUMBUS, OHIO, USA

**Joining of Advanced and Specialty Materials (JASM XX)
 — Ultrasonic Joining**

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

Wednesday PM
 October 17, 2018
 Room: C171
 Location: Greater Columbus Convention Center

Session Chair: Vikas Patel, ArcelorMittal USA

2:00 PM
Effect of Steel Microstructure on the Bonding of Steel and Nickel by Ultrasonic Welding: *Jheyu Lin*¹; ¹University of Tokyo

2:20 PM
Weld Formation during Ultrasonic Welding of Al Alloy to Cu: *Hiromichi Fujii*¹; Hiroki Endo¹; Yutaka Sato¹; Hiroyuki Kokawa¹; ¹Tohoku University

2:40 PM
Determination of Interfacial Wavelength and Process Parameters in Impact Welds: *Taeseon Lee*¹; Jackson Peck¹; Isabel Boona¹; Anupam Vivek¹; Glenn Daehn¹; ¹Ohio State University

3:00 PM
Thermal Fatigue Properties of Ultrasonic Bonded Copper Joint: *Takahito Fushimi*¹; Tomoki Matsuda¹; Tomokazu Sano¹; Akio Hirose¹; ¹Osaka University

3:20 PM Break

3:40 PM
Development of a Hybrid Ultrasonic-resistance Spot Welding System for Aluminum Sheet: *Lindsey Lindamood*¹; David Workman¹; Jerry Gould¹; ¹EWI

4:00 PM
Ultrasonic Bonding for LED Device Mounted on E-textile Using Plastic Flow of Solder as Cushioning Material: *Hiroaki Mori*¹; Kazushi Matsuoka¹; Hiromichi Fujii²; Atsuji Masuda³; ¹Osaka University; ²Tohoku University; ³Industrial Technology Center of Fukui Prefecture

4:20 PM
Multi-material Integration for Automotive Structures Using Ultrasonic Additive Manufacturing: *Hongqi Guo*¹; Mark Gingerich¹; Leon Headings¹; Ryan Hahnlen²; Marcelo Dapino¹; ¹The Ohio State University; ²Honda R&D Americas, Inc.

**Joining of Advanced and Specialty Materials (JASM XX)
 — Welding Metallurgy II**

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

Wednesday PM
 October 17, 2018
 Room: C172
 Location: Greater Columbus Convention Center

Session Chairs: Doris Ivette Villalobos Vera, Instituto Tecnológico de Veracruz; Ivan Mendoza-Bravo, Instituto Tecnológico de Veracruz

2:00 PM
Weldability of Additively Manufactured 304L Stainless Steel: *Jeffrey Rodelas*¹; Daniel Tung¹; Alexander Barr¹; Matthew Vieira¹; ¹Sandia National Laboratory

2:20 PM
Chloride-induced Stress Corrosion Cracking Behavior in 304 Stainless Steel Weldments: *Xin Wu*¹; Zhenzhen Yu¹; Scott Gordon¹; Stephen Liu¹; Zeev Shayer¹; Christopher Alexander²; Eric Schindelholz²; Charles Bryan²; ¹Colorado School of Mines; ²Sandia National Laboratories

2:40 PM
Preliminary Investigations into LME Induced Failures in Austenitic Stainless Steels: *Dean Sage*¹; Carolin Fink¹; ¹Ohio State University

3:00 PM
Strength Recovery in Welds of 17-4 and 13-8+Mo Maraging Stainless Steels: Robert Hamlin¹; *John DuPont*¹; ¹Lehigh University

3:20 PM
Tempering Response of Type 410 Welding Consumables and Base Metals: *Benjamin Lawson*¹; Boian Alexandrov¹; ¹The Ohio State University

3:40 PM Break

4:00 PM
Phase Transformations and Mechanical Properties of Welds Produced with a 10 wt% Ni Steel Welding Consumable: *Erin Barrick*¹; John DuPont¹; ¹Lehigh University

4:20 PM
Quantification of the Tempering Response in Grade 22 Steel for Temper Bead Welding Applications: *Jeff Stewart*¹; Boian Alexandrov¹; ¹The Ohio State University

4:40 PM
Effect of Multipass Welding on the Microstructural Evolution and Mechanical Properties of High Strength Low Alloy 100 Steel: *Jonah Duch*¹; John DuPont¹; ¹Lehigh University

5:00 PM
Effect of Materials on Weld Residual Stress of Ship Structures: *Yu-Ping Yang*¹; TD Huang¹; Wei Zhang²; Charles Fisher³; Steve Scholler⁴; Randy Dull⁵; ¹Huntington Ingalls Shipbuilding; ²The Ohio State University; ³Naval Surface Warfare Center – Carderock Division; ⁴Huntington Ingalls Shipbuilding; ⁵EWI

WEDNESDAY PM

Journal of the American Ceramic Society Awards Symposium — JACerS Awards Symposium Session II

Program Organizer: William Fahrenholtz, Missouri University of Science and Technology

Wednesday PM
October 17, 2018

Room: A125
Location: Greater Columbus Convention Center

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

2:00 PM Invited

Emerging Opportunities in Ceramics and Glass Research: Follow-up from a 2016 NSF Workshop: *Katherine Faber*¹; ¹California Institute of Tech

2:30 PM Invited

Current Understanding and Future Research Directions at the Onset of the Next Century of Sintering Science and Technology: *Rajendra Bordia*¹; Suk-Joong Kang²; Eugene Olevsky³; ¹Clemson University; ²Korea Advanced Institute of Science and Technology (KAIST); ³San Diego State University

3:00 PM Invited

Mobility Transition is the Mechanism behind Two-step Sintering: *Yanhao Dong*¹; I-Wei Chen²; ¹Massachusetts Institute of Technology; ²University of Pennsylvania

3:30 PM Break

4:00 PM Invited

Characterization and Modeling of Microstructural Level Stresses in Alumina: *Melissa Teague*¹; Theron Rodgers¹; Scott Grutzik¹; Stephen Meserole¹; ¹Sandia National Laboratories

4:30 PM Invited

Viscosity of Glass-forming Systems: From Medieval Stained Glass Windows to Advanced Functional Glasses: *John Mauro*¹; ¹The Pennsylvania State University

5:00 PM Invited

Energetics and Structure Relations of Solid Phases in Silicon–oxygen–carbon System: *Jiwei Chen*¹; Sean King²; Alexandra Navrotsky³; ¹University of California Davis; ²Intel Corporation; ³Peter A. Rock Thermochemistry Laboratory and NEAT ORU, University of California Davis

5:30 PM Invited

Environmental Resistance of Cr₂AlC MAX Phase at High Temperature: *Jesus Gonzalez-Julian*¹; Olivier Guillon¹; Robert Vassen¹; ¹Forschungszentrum Jülich

6:00 PM Concluding Comments

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

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

Wednesday PM
October 17, 2018

Room: B130
Location: Greater Columbus Convention Center

Session Chairs: Roderick Guthrie, McGill University; Mohamad Idriss, CTA-BRP-UdeS

2:00 PM

The Internet of Things (IoT) for Casting with 3D Printed Sand Molds: Jason Walker¹; Brian Vuksanovich¹; Eric MacDonald¹; *Brett Conner*¹; Guha Manogharan²; Santosh Reddy Sama³; Richard Lonardo³; Kirk Rogers⁴; Gerard Thiel⁵; Kip Woods⁵; ¹Youngstown State University; ²Pennsylvania State University; ³Youngstown Business Incubator; ⁴M&P Gravity Works LLC; ⁵University of Northern Iowa

2:20 PM

Porosity Management in High Pressure Aluminum Die Castings: *Dan Beabout*¹; ¹Spectraforce

2:40 PM

A Numerical Simulation of Transport Phenomenon for the Casting of AA6111 Plate Using Horizontal Single Belt Pilot Caster: *Usman Niaz*¹; Mihaiela Isac¹; Roderick Guthrie¹; ¹McGill University

3:00 PM

Numerical and Physical Modeling of Horizontal Single Belt Casting (HSBC) of AA5182 Alloy for the Production of Thin Strip Material: *Cheng-Hung Hsin*¹; Roderick Guthrie¹; Mihaiela Isac¹; ¹MMPC, McGill University

Manufacturing-Related Failures — Medical Device Failures

Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMS)

Wednesday PM
October 17, 2018

Room: A210
Location: Greater Columbus Convention Center

Session Chairs: Margaret Flury, Medtronic; Dana Medlin, EAG Laboratories, Inc.; Brad James, Exponent Failure Analysis Associates; Michael Roach, University of Mississippi Medical Center

2:00 PM Invited

Retrieval and Analyses of Medical Devices for 5 Decades: *Jack Lemons*¹; ¹UAB

2:40 PM

Failure Analysis of Orthopedic Implants: *Gabriel Ganot*¹; Brad James¹; ¹Exponent

3:00 PM

Fatigue-to-fracture Testing, Finite Element Analysis, and Metallographic Analysis to Estimate Fatigue Durability of Superelastic Nitinol Stents for Medical Device Use: Sabrina Huang¹; Seogwan Kim¹; Sara Sherman¹; Alan Saunders¹; *Ray Boudreaux*¹; ¹Cook Research Incorporated



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3:20 PM Invited

Incidence and Characterization of Corrosion in Stainless Steel Percutaneous Lead Systems Located Exterior to the Body: *Janet Gbur¹; Dustin Tyler¹; John Lewandowski¹; ¹Case Western Reserve University*

3:40 PM Break

4:00 PM

Case Studies on Sterilization-induced Failures in Metallic Medical Devices: *Matthew Bowers¹; Brad James¹; ¹Exponent, Inc.*

4:20 PM Invited

Failure Analysis of Fracture Fixation Devices for Medical Implant Applications: *Dana Medlin¹; ¹EAG Laboratories, Inc.*

Materials Degradation in CO₂ Environments — Session II

Program Organizers: Richard Oleksak, National Energy Technology Laboratory; Julie Tucker, Oregon State University; Matthew Walker, Sandia National Laboratories

Wednesday PM
 October 17, 2018

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

Session Chairs: Matthew Walker, Sandia National Laboratories; Richard Oleksak, National Energy Technology Laboratory

2:00 PM Invited

Considerations in Materials Selection due to Oxidation in sCO₂ Compact Heat Exchangers: *John Shingledecker¹; Steven Kung¹; Ian Wright²; Adrian Sabau³; ¹EPRI; ²WrightHT; ³Oak Ridge National Laboratory*

2:30 PM

Corrosion and In-situ Low Cycle Fatigue of 316L Stainless Steel in Supercritical CO₂: *Julie Tucker¹; Lucas Teeter¹; Benjamin Adam¹; Sebastien Teyssseyre²; ¹Oregon State University; ²Idaho National Laboratory*

2:50 PM

Effect of Supercritical CO₂ Exposure on Fatigue Thresholds in Nickel Superalloys Compared to Steam and Vacuum Exposures: *Kyle Rozman¹; Ömer Dogan¹; Gordon Holcomb¹; Casey Carney¹; Jeffrey Hawk¹; ¹National Energy Technology Laboratory*

3:10 PM Invited

Evaluation of Diffusion-bonded Joints of Austenitic Alloys Exposed to S-CO₂ Environment: *Changheui Jang¹; Ho Jung Lee²; Sung Hwan Kim¹; Sunghoon Hong²; ¹Korea Advanced Institute of Science & Technology; ²Korea Hydro and Nuclear Co., Ltd.*

3:40 PM Break

4:00 PM

Corrosion and Mechanical Performance of Grade 92 F-M Steel after Exposure to s-CO₂: *Andrew Brittan¹; Mark Anderson¹; ¹University of Wisconsin-Madison*

4:20 PM

Effect of Carburization on Deformation Behavior of a Metal-weld in sCO₂ Power Cycle Applications: *Sajedur Akanda¹; Kyle Rozman¹; Reyixiati Repukaiti¹; Ömer Dogan¹; Jeffrey Hawk¹; ¹National Energy Technology Laboratory*

4:40 PM

The Effect of Carbon Dioxide Environment on the Spark Plasma Sintering of Cerium(IV) Oxide: *Anil Prasad¹; Linu Malakkal²; Lukas Bichler¹; Jerzy Szpunar²; ¹University of British Columbia; ²University of Saskatchewan*

5:00 PM

The Thermodynamic Investigation of the Effect of CO₂ to the Stability of (La_{0.8}Sr_{0.2})_{0.98}MnO₃d and La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O₃d as Cathodes of Solid Oxide Fuel Cell: *Shadi Darvish¹; Yu Zhong²; ¹Florida International University; ²Worcester Polytechnic Institute*

Materials for Nuclear Applications and Extreme Environments — Processing and Behavior of Novel Fuels II

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

Wednesday PM
 October 17, 2018

Room: D183
 Location: Greater Columbus Convention Center

Session Chair: Cory Trivelpiece, Savannah River National Laboratory

2:00 PM Invited

Technology Development for Applying a Two-stage Endcap to High Thermal Stability Fuel Rods: *Jerry Gould¹; Cem Topbasi²; Bo Cheng²; Lindsey Lindamood¹; Steve Manring¹; Tim Mikel¹; ¹Edison Welding Inst; ²Electric Power Research Institute*

2:40 PM Invited

Microstructural and Microchemical Characterization of Nuclear Fuels: *Assel Aitkaliyeva¹; ¹University of Florida*

Mechanochemical Synthesis and Reactions in Materials Science III — Session II

Program Organizers: Antonio Fuentes, Cinvestav Unidad Saltillo; Laszlo Takacs, University of Maryland Baltimore County; Challapalli Suryanarayana, University of Central Florida; Huot Jacques, University Du Quebec A Trois Rivieres

Wednesday PM
 October 17, 2018

Room: B131
 Location: Greater Columbus Convention Center

Session Chair: Antonio Fuentes, Cinvestav Unidad Saltillo

2:00 PM Invited

Kinetics of Mechanical Amorphization: Effective Avrami Exponents: *Javier Blázquez¹; Alejandro Manchón-Gordón¹; Jhon Ipus¹; Clara Conde¹; Alejandro Conde¹; ¹University of Sevilla*

2:30 PM

A Multiscale Model of Solid State Amorphization during Milling of Pharmaceutical Materials: *Yifei Zeng¹; Lorena Alzate-Vargas¹; Pilsun Yoo¹; Chunyu Li¹; Rachel Frocino³; Jeff Brum²; Peilin Liao¹; Alejandro Strachan¹; Marisol Koslowski¹; ¹Purdue University; ²GlaxoSmithKline, Analytical Sciences and Development*

3:00 PM

Phase Evolution during Mechanical Alloying of Equiatomic Iron-cobalt-nickel Alloy: *Anuj Rathi¹; Vamsi Meka¹; Tanjore Jayaraman¹; ¹University of Michigan-Dearborn*

WEDNESDAY PM

3:20 PM Break

3:40 PM

The Effect of Yttrium on the Grain Growth of Nanocrystalline Titanium: *Peter Feldmann*¹; Carl Koch¹; Ron Scattergood¹; ¹North Carolina State University

4:00 PM

Power Law Modeling of Acoustic Cavitation Erosion as a Materials Processing Technique: *Jeremy Wright*¹; Brian Mitchell²; ¹Tulane University; ²Tulane University

4:20 PM

Combined Mechanochemical/Thermal Route for Smart Synthesis of LiFeSi₂O₆ from Different Fe and Si Sources: *Erika Tóthová*¹; Ralf Witte²; Michal Hegedüs³; Mamoru Senna⁴; Horst Hahn²; Paul Heitjans⁵; Vladimír Šepelák²; ¹Institute of Geotechnics, Slovak Academy of Sciences; ²Institute of Nanotechnology, Karlsruhe Institute of Technology; ³Institute of Chemistry, P. J. Šafárik University in Košice; ⁴Faculty of Science and Technology, Keio University; ⁵Institute of Physical Chemistry and Electrochemistry, Leibniz University Hannover

4:40 PM

Effect of Cold Rolling and Ball Milling on the First Hydrogenation of Air Exposed TiFe + 4% Zr Alloy: Joydev Manna¹; *Huot Jacques*¹; ¹University Du Quebec A Trois Rivieres

Microalloyed Steels — Microalloyed Steels III

Program Organizers: Emmanuel De Moor, Colorado School of Mines; Steven Jansto, CBMM-North America Inc; Robert Glodowski, RJG Metallurgical LLC

Wednesday PM
October 17, 2018

Room: A225
Location: Greater Columbus Convention Center

Session Chair: To Be Announced

2:00 PM Invited

Quality Assessment and Suggestion of Standard Revision for High Strength Rebars in China: *Caifu Yang*¹; Xuehui Chen¹; Ruizhen Wang¹; ¹Central Iron and Steel Research Institute

2:30 PM

Recrystallized Controlled Forging: The Key to Strong, Tough, Economical Microalloyed Steel Forgings with Relaxed Forging Conditions and No Heat Treatment: *Aaron Stein*¹; Anthony DeArdo¹; ¹University of Pittsburgh

2:50 PM

Characterization of Microalloyed Armor Steels Produced in Small Scale: *William Williams*¹; Haley Doude¹; Andrew Oppedal¹; Wilburn Whittington¹; Hongjoo Rhee¹; ¹CAVS

3:10 PM

Effect of Aluminum and Vanadium Fine Grain Practice on the Machinability of 4140 Steel: *Mark Emmendorfer*¹; Simon Lekakh¹; Laura Bartlett¹; Ronald O'Malley¹; Geary Ridenour²; Eduardo Sheid²; John Heerema³; ¹Missouri Univ of Science & Technology; ²Gerdau Special Steel North America; ³Gerdau Long Steel North America

3:30 PM Break

3:50 PM

Effect of Nitrogen Content on the Microstructures and Mechanical Properties in Simulated CGHAZ of Normalized Vanadium Microalloyed Steel: *Feng Chai*¹; Zhongran Shi¹; Caifu Yang¹; Xuehui Chen¹; ¹Central Iron and Steel Research Institute

4:10 PM

Study of Heat Treatment Process on Mechanical Properties of 10CrNiMoV Bulb Flat Steel: *Xuehui Chen*¹; Caifu Yang¹; Feng Chai¹; Qian Zhang¹; Yaqing Hou¹; Li Yang¹; ¹Central Iron and Steel Research Institute

4:30 PM

Research and Development of Low Cost x65 and x70 Niobium Microalloyed Pipeline Steel: *Xiaolong Yang*¹; Qiang Wang¹; Shaojiang Yin¹; Miao Zang¹; Zhixiu Zheng¹; Weijian Liu¹; Yunge Wang¹; ¹Hebei Iron and Steel Group Tangsteel Company

Multiscale Modeling of Microstructure Deformation in Material Processing — Multiscale Modeling of Microstructure Deformation in Material Processing - Part II

Program Organizers: Lukasz Madej, AGH University of Science and Technology; Krzysztof Muszka, AGH University of Science and Technology; Danuta Szeliga, AGH University of Science and Technology; Jaimie Tiley, Air Force Office of Scientific Research

Wednesday PM
October 17, 2018

Room: C170
Location: Greater Columbus Convention Center

Session Chairs: Lukasz Madej, AGH University of Science and Technology; Krzysztof Muszka, AGH University of Science and Technology

2:00 PM

Simulation of Dendrite Formation during Unstable Solidification Using a Second Order Level Set Method: *Vimal Ramanuj*¹; Ramanan Sankaran¹; ¹Oak Ridge National Laboratory

2:20 PM

Phase-field Approach Coupled with Crystal Plasticity for Three-Dimensional Static Recrystallization in Ti-7Al Alloys and Comparison with Experiment: *Arunabha Mohan Roy*¹; Sriram Ganesan¹; Pinar Acar¹; Anna Trumpf¹; Susan Gentry¹; John Allison¹; Katsuyo Thornton¹; Veera Sundararaghavan¹; ¹University of Michigan-Ann Arbor

2:40 PM

Deep Learning to Predict Stress Levels in a Microstructure under Uniaxial Tensile Deformation: *Ankita Mangal*¹; Elizabeth Holm¹; ¹Carnegie Mellon University

3:00 PM

Micromechanics-based Modeling of Grain Boundary Sliding Mechanism: Shoieb Chowdhury¹; *Hesam Askari*¹; ¹University of Rochester

3:20 PM

Modelling of Recrystallization Kinetics with Combined Finite Element and Phase Field Method: *Krzysztof Muszka*¹; Maciej Paszynski¹; Grzegorz Gurgul¹; Paulina Lisiecka-Graca¹; Danuta Szeliga¹; ¹AGH University of Science and Technology

3:40 PM Break

4:00 PM

A Crystal Plasticity Model for Dynamic Recrystallization in Ti-6Al-4V Alloy: *Arunabha Mohan Roy*¹; Veera Sundararaghavan¹; ¹University of Michigan-Ann Arbor

4:20 PM

Concepts of Communication Interface in the FE2 Method: *Adam Legwand*¹; Lukasz Madej¹; ¹AGH University of Science and Technology



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 GREATER COLUMBUS CONVENTION CENTER
 COLUMBUS, OHIO, USA

4:40 PM

Viscoplastic Self-consistent Modeling of Grain size Effects on Slip and Twinning in High Purity α -Ti: *Daniel Savage*¹; Zhangxi Feng¹; Nicholas Ferreri¹; Marko Knezevic¹; ¹University of New Hampshire

Multiscale Simulation and Experimental Validation of Additive Manufacturing Technologies: A Status Update by Academia, Solution Providers and Industry on Its Intake, Market Opportunities Now and Going Forward — Multiscale Simulation in Additive Manufacturing and AM Panel Discussion

Program Organizers: Deepankar Pal, 3DSIM; Ankit Saharan, EOS ; Anthony Rollett, Carnegie Mellon University; Adrian Sabau, Oak Ridge National Laboratory

Wednesday PM Room: A221
 October 17, 2018 Location: Greater Columbus Convention Center

Session Chair: Ankit Saharan, EOS

2:00 PM

Beyond Single Part Qualification in AM: *Mikkel Pedersen*¹; Simon Sankare¹; Simon Mckown²; Shawn Kelly²; Blanka Szost¹; Dan Johns¹; ¹Oerlikon AM GmbH; ²Oerlikon AM (US) Inc.

2:30 PM **Invited**

Microstructure Modeling of Inconel 718 Processed through Additive Manufacturing Process: *Javed Akram*¹; Pradeep Chalavadi¹; Deepankar Pal¹; Dave Conover¹; Brent Stucker¹; ¹ANSYS

2:50 PM

Process Monitoring in Additive Manufacturing: *Anja Loesser*¹; ¹Eos Na

3:20 PM

Simulation Driven Design for Additive Manufacturing: *Spencer Thompson*¹; ¹EOS of North America

3:50 PM **Break**

4:10 PM

Simulation and Validation for Better Build Plate Designs: *Abdul Khader Khan*¹; Deepankar Pal¹; Kevin Chou²; ¹Ansyes, Inc; ²University of Louisville

4:30 PM **Invited**

New Support Structure Generation Methodologies in Metal Melting Based Additive Manufacturing Technologies: *Deepankar Pal*¹; Kevin Chou²; Abdul Khan³; ¹3DSIM; ²University of Louisville; ³ANSYS

4:50 PM **Panel Discussion**

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

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

Wednesday PM Room: D181
 October 17, 2018 Location: Greater Columbus Convention Center

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

2:00 PM **Introductory Comments**

2:40 PM

Structural and Electrical Properties of Hierarchical Multiscale Carbon Fabric: *Wenhu Wang*¹; Sharmila Mukhopadhyay¹; ¹Wright State University

3:00 PM

Optimized Synthesis of Copper Oxide Nanoparticles Using a Simple Microwave-assisted Method: *Shishir Kumar*¹; Adarsh Bafana¹; Prasad Pawar¹; Ashiqur Rahman¹; Si Amar Dahoumane²; Clayton Jeffries¹; ¹Lamar University; ²Yachay Tech University

3:20 PM **Break**

3:40 PM

Three-dimensional Graphene Foam-polymer Composite with Superior Deicing Efficiency and Strength: *Jennifer Bustillos*¹; Cheng Zhang²; Benjamin Boesl²; Arvind Agarwal²; ¹Florida International University; ²Florida International Univ

4:00 PM

The Development & Characterization of Mechanically Exfoliated Graphite Based Counter Electrode for Natural Dye Sensitized Solar Cell (DSSC): *Muhammad Manzoor*¹; Muhammad Butt¹; Tahir Ahmad¹; Muhammad Kamran¹; ¹University of the Punjab

4:20 PM

Thin Film Dielectric Polymer-ceramic Composites for Flexible Tactile Sensors Embedded within Robotic End-effectors: *James Meyer*¹; Kavin Sivaneri Varadhragan Idaiam²; Edward Sabolsky²; Thomas Evans²; Powsiri Klinkhachorn³; ¹West Virginia University; ²Department of Mechanical and Aerospace Engineering, West Virginia University; ³Lane Department of Computer Science and Electrical Engineering, West Virginia University

4:40 PM

Structural and Electrical Properties of Cadmium Substituted Cobalt Nano Ferrites by Citrate-gel Auto Combustion Method: *Ravinder Dachehalli*¹; ¹Osmania University

5:00 PM **Concluding Comments**

WEDNESDAY PM

New Advances and Innovations in Corrosion of Refractory Ceramics — International Symposium on New Advances and Innovation in Corrosion of Refractory Ceramics II

Program Organizers: James Hemrick, Reno Refractories, Inc.; William Headrick, Jr, Missouri Refractories; Michel Rigaud, École Polytechnique

Wednesday PM
October 17, 2018
Room: A120
Location: Greater Columbus Convention Center

Session Chairs: James Hemrick, RENO Refractories Inc; William Headrick, Missouri Refractories; Michel Rigaud, École Polytechnique de Montréal

2:00 PM Introductory Comments Dr. James Hemrick

2:05 PM Invited

Thermo-chemo-mechanical Modelling of Refractories Behavior in Service: Keypoints and New Developments: *Eric Blond¹*; Anh Khoa Nguyen¹; Thomas Sayet¹; Athanasios Batakis¹; Emmanuel De Bilbao¹; Minh-Duc Duong¹; ¹University of Orléans

2:45 PM

Applications of Kinetic Models to the Chemical Corrosion of Refractory in the Steelmaking Process: *Marie-Aline Van Ende¹*; In-Ho Jung¹; ¹Seoul National University

3:05 PM

Dissolution of Ceramic Particle into Molten Slags: Design of Experiment and Interpretation of Result: *Youn-Bae Kang¹*; ¹POSTECH

3:25 PM Break

3:45 PM Introductory Comments Dr. William Headrick

3:50 PM

Isolation or Corrosion of Microporous Magnesia in Contact with Slags of Different Basicity: *Ao Huang¹*; Huazhi Gu¹; Lvping Fu¹; ¹State Key Laboratory of Refractories and Metallurgy

4:10 PM Invited

How to Match the Refractory Industry Needs for Continuous Innovation?: *Michel Rigaud¹*; Jacques Poirier¹; ¹École Polytechnique

4:50 PM Concluding Comments Dr. Michel Rigaud

5:10 PM TRI Reception

Next Generation Biomaterials — Biomaterials V

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

Wednesday PM
October 17, 2018
Room: D182
Location: Greater Columbus Convention Center

Session Chairs: Anthony Wren, Inamori School of Engineering; Yusuf Khan, University of Connecticut

2:00 PM Invited

Germanium Based Glass Polyalkenoate Cements for Skeletal Applications: Glass Characterization and Physical and Bioactive Properties: *Anthony Wren¹*; Sahar Mokhtari¹; Emily Krull²; Aisling Coughlan²; Nathan Mellott³; ¹Alfred University; ²University of Toledo; ³Michigan State University

2:20 PM

Effect of Radiation on Biologically Active Glasses: Areeba Tufail¹; Brit Lee¹; Puneet Gill¹; Eric Bowman¹; Bradley Arnold¹; Fow-Sen Choa¹; Brian Cullum¹; Ching-Hua Su¹; *Narsingh Singh¹*; ¹University of Maryland, Baltimore County

2:40 PM

Effects of Silver and Aluminum Addition in the Zirconium Based Thin Film Metallic Glass: *Akib Javed¹*; Waseem Haider¹; Ishraq Shabib¹; ¹Central Michigan University

3:00 PM Invited

Dual Growth Factor Delivery from Devitalized Allografts Enhances Healing in a Large Scale Segmental Bone Defect Model: *Yusuf Khan¹*; ¹University of Connecticut

3:20 PM Break

3:40 PM

Towards Superior Bio-implant Steels through Submerged Friction Stir Processing: Gopinath Perumal¹; Amrita Chakrabarti¹; Aditya Ayyagari²; Deepika Kannan¹; Soumya Pati¹; Harpreet Grewal¹; *Sundeep Mukherjee²*; Shailja Singh¹; Harpreet Arora¹; ¹Shiv Nadar University; ²University of North Texas

4:00 PM

Tribocorrosion Behavior of Nanostructured Biomedical Co-Cr-Mo Alloys through High Pressure Torsion: *Hakan Yilmazer¹*; Fatih Toptan²; Mitsuo Niinomi³; Burak Dikici⁴; Alexandra Alves²; Ihsan Çaha²; Murat Isik²; Hasan Koklu¹; Zenji Horita⁶; ¹Yildiz Technical University; ²Universidade do Minho; ³Tohoku University; ⁴Atatürk University; ⁵Washington State University; ⁶Kyushu University

4:20 PM

Graphene Dispersed Silane Compound Coating and Its Immunity: *Hideyuki Kanematsu¹*; Katsuhiko Sano²; Dana Barry³; Akiko Ogawa¹; Nobumitsu Hirai¹; Takeshi Kougo¹; Daisuke Kuroda¹; Yoshimitsu Mizunoe⁴; ¹National Institute of Technology, Suzuka College; ²D&D Corporation, Japan; ³Clarkson University; ⁴The Jikei University School of Medicine

4:40 PM

Cu-bearing Antibacterial Stainless Steels as Novel Metallic Biomaterials: *M. Babar Shahzad¹*; Wei Wang¹; Yiyin Shan¹; Ke Yang¹; ¹Institute of Metal Research



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GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

Phase Transformations in Ceramics: Science and Applications — Phase Transformations in Ceramics: Science and Applications - Processing-Microstructure-Properties I

Program Organizers: Waltraud Kriven, University of Illinois at Urbana-Champaign; Pankaj Sarin, Oklahoma State University; Yu Zhong, Worcester Polytechnic Institute

Wednesday PM
October 17, 2018

Room: A124
Location: Greater Columbus Convention Center

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

2:00 PM Invited

Microstructural Engineering of Powders for Scalable Processing of Metal-ceramic Nanocomposites: *Helen Chan*¹; Kevin Anderson¹; Richard Vinci¹; Edward Gorzkowski²; Eric Patterson²; Scooter Johnson²; ¹Lehigh University; ²Naval Research Laboratory

2:30 PM Invited

Unusual Phase Transformations during Flash Sintering: *Rishi Raj*¹; ¹University of Colorado

3:00 PM

In-situ Study on Mechanical Behavior of Flash-sintered Yttria Stabilized Zirconia at Elevated Temperature: Jaehun Cho¹; Qiang Li¹; Han Wang¹; Zhe Fan¹; Jin Li¹; Sichuang Xue¹; Haiyan Wang¹; Troy Holland²; Amiya Mukherjee³; *Xinghang Zhang*¹; ¹Purdue University; ²Colorado State University; ³University of California, Davis

3:20 PM Break

3:40 PM

New Heat Treatment Method to Manipulate the Structure of PMN-PT Single Crystals: *Hooman Sabarou*¹; Vadym Drozd²; Osama Awadallah²; Andriy Durygin²; Dehua³; Yu Zhong⁴; ¹Worcester Polytechnic Institute; ²Florida International University; ³Navy Undersea Warfare Center; ⁴Worcester Polytechnic Inst

4:00 PM Invited

In-situ SEM & XRD Study of Selective Reduction of Metals from Oxides: *Scott Mixture*¹; ¹Alfred University

4:30 PM

BaO-doped TiO₂ Nanostability: The Role of Surface Segregation on Phase Transition: Andre Da Silva¹; Douglas Gouvêa¹; *Ricardo Castro*²; ¹University of São Paulo; ²University of California, Davis

4:50 PM

Domain-selective and Facet-selective Photoreactivity on the Surface of Ferroelastic CaTiO₃: *Kayla Zitello*¹; Paul Salvador¹; Gregory Rohrer¹; ¹Carnegie Mellon University

PSDK XIII: Phase Stability and Diffusion Kinetics — Manufacturing and Phase Transformations

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

Wednesday PM
October 17, 2018

Room: A213
Location: Greater Columbus Convention Center

Session Chairs: Chelsey Hargather, New Mexico Institute of Mining and Tech; Xiaochun Li, University of California, Los Angeles

2:00 PM Invited

Breaking Metallurgical Barriers by Nanotechnology Enabled Microstructure Control: *Xiaochun Li*¹; ¹University of California

2:20 PM

Predicting Precipitation Strengthening in Mg-Nd Alloys Using Phase Field Modeling, Dislocation Dynamics, and Experiments: *Stephen DeWitt*¹; Chaoming Yang¹; Arunabha Roy¹; Zhihua Huang¹; Amit Misra¹; Liang Qi¹; John Allison¹; ¹University of Michigan

2:40 PM

B4C-TiC to TiB₂-C High Temperature Transformation: Boron Carbide Stability and Boron Transport Mechanisms: *Oleksii Popov*¹; Oleksandra Klepko²; Serhii Chornobuk¹; Edward Lutsak²; ¹Taras Shevchenko National University of Kyiv; ²V. Bakul Institute for Superhard Materials

3:00 PM

Phase Separation and Ordering in FCC/BCC Solid Solutions Using Steepest-entropy-ascent Quantum Thermodynamics: *Ryo Yamada*¹; Michael Von Spakovsky¹; William Reynolds, Jr.¹; ¹Virginia Polytechnic Institute

3:20 PM Break

3:40 PM Invited

A First-principles Investigation of an Improved 5-Frequency Model for Solute Diffusion: *Chelsey Hargather*¹; Shun-Li Shang²; Zi-Kui Liu²; ¹New Mexico Institute of Mining and Technology; ²Pennsylvania State University

4:10 PM

Carburization and Nitridation of Fe-based Diffusion Multiples for Carbonitride Characterization: *Chris Eastman*¹; Ji-Cheng Zhao²; ¹TimkenSteel Corporation; ²The Ohio State University

4:30 PM

θ' to θ Transformation in Al-Cu Alloys Investigated with Phase Field Simulations, Advanced Characterization, and Mathematical Analysis: *Patrick Shower*¹; Dongwon Shin¹; Lawrence Allard¹; James Morris¹; Jonathan Poplawsky¹; Amit Shyam¹; ¹Oak Ridge National Laboratory

4:50 PM

Computational Thermodynamic and Kinetic Modeling for Phase Dissolution and Growth in Al Alloys: *Kyle Fitzpatrick-Schmidt*¹; Victor Champagne²; Danielle Cote¹; ¹Worcester Polytechnic Institute; ²US Army Research Laboratory

5:10 PM

Thermodynamic Analysis of the Suitability of Binary Oxides for MBE Source Materials: *Kate Adkison*¹; Brandon Bocklund¹; Darrell Schlom²; Zi-Kui Liu¹; ¹Pennsylvania State University; ²Cornell University

WEDNESDAY PM

Semiconductor Heterostructures: Theory, Growth, Characterization, and Device Applications — Semiconductor Heterostructures II

Program Organizers: John Ayers, University of Connecticut; Ganesh Balakrishnan, University of New Mexico; Phil Ahrenkiel, South Dakota School of Mines & Technology

Wednesday PM
October 17, 2018

Room: B132
Location: Greater Columbus Convention Center

Session Chair: Ganesh Balakrishnan, University of New Mexico

2:00 PM Introductory Comments

2:05 PM

Epitaxial Growth of Photonic Crystal Surface Emitting Lasers: *Kevin Reilly*¹; Sathvikas Addamane¹; Emma Renteria¹; Akhil Raj Kumar Kalapala²; Seungwon Yeom²; Weidong Zhou²; Ganesh Balakrishnan¹; ¹University Of New Mexico; ²University of Texas at Arlington

2:25 PM

Effect of Core Material on Gas Sensing Properties of Core Shell Nanostructures: *Priyanka Karnati*¹; Shiekh Akbar²; Patricia Morris¹; ¹The Ohio State University; ²Department of Material Science and Engineering The Ohio State University

2:45 PM

Electrical Properties of Mo/SiC Schottky Barrier Diodes: *Sai Naredla*¹; Tom Oder¹; ¹Youngstown State University

3:05 PM

Plasma-enhanced MOCVD for Growth of Elemental Al on III-V Surfaces: *Nikhil Pokharel*¹; Nathan Smaglik¹; Phil Ahrenkiel¹; ¹South Dakota School of Mines & Technology

3:25 PM

Restraint of Surface Degeneration during the High Temperature Annealing of AlN Buffer Layer in N₂-CO Gas Ambient by Quasi-closed System: *Cheng Cheng*¹; ¹National Central University

Small-scale Properties of Materials and Length-scale Phenomena — Mechanical Testing

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

Wednesday PM
October 17, 2018

Room: A121
Location: Greater Columbus Convention Center

Session Chairs: Finn Giuliani, Imperial College London; Gaurav Mohanty, Tampere University of Technology

2:00 PM Invited

Role of Surfaces on the Length-scale Dependence of the Incipient Yield Stress of Ductile Metals: *Robert Klassen*¹; Azm Islam¹; Mahdi Bagheripoor¹; ¹University of Western Ontario

2:20 PM Invited

Small Scale Mechanical Testing Techniques Applied to Engineering Materials. Benefits and Challenges: *Peter Hosemann*¹; David Frazer¹; Cameron Howard¹; Anya Prasitthipayongop¹; Hi Vo¹; David Krumwiede¹; ¹University of California, Berkeley

2:40 PM Invited

Exploring the Limits of Additive Strengthening Mechanisms in Nanocrystalline, Nanotwinned Metallic Thin Films: *Jessica Krogstad*¹; ¹University of Illinois, Urbana-Champaign

3:00 PM Invited

Recent Applications of Nanoindentation for Further Understanding of Advanced Structural Materials: Dong-Hyun Lee¹; Guanghui Yang¹; Jeong-Min Park¹; *Jae-il Jang*¹; ¹Hanyang University

3:20 PM Break

3:40 PM Invited

Reduced Geometry Tensile Samples For Property Evaluation In Stampings From 3rd Generation AHSS: *Andrew Frerichs*¹; Grant Justice¹; Brian Meacham¹; Sheng Cheng¹; Alla Sergueeva¹; Daniel Branagan¹; ¹NanoSteel Company Inc

4:00 PM Invited

The Effect of Thin Carbon and Chemomechanically Softened Layers on the Near Surface Mechanical Properties of Sapphire Tested by Nanoindentation: *Stephen Bull*¹; Arti Yadav¹; ¹Newcastle University

4:20 PM

Mechanical Behavior of High Strength Nanotwinned AlMg Alloy: *Sichuang Xue*¹; Qiang Li¹; Yifan Zhang¹; Han Wang¹; Haiyan Wang¹; Xinghang Zhang¹; ¹Purdue University

4:40 PM Invited

Bulk Moduli and High-Pressure Crystal Structures of Uranium Silicides: *Xiaofeng Guo*¹; Xujie Lü²; Joshua White³; Andrew Nelson³; Robert Roback³; Hongwu Xu³; ¹Washington State University; ²Center for High Pressure Science & Technology Advanced Research; ³Los Alamos National Laboratory

5:00 PM Invited

Mechanical Interface Energies for Capturing Grain Boundary Effect in Sub Micron Volumes: *Katerina Afantis*¹; Bryan Kuhr¹; ¹University of Florida

5:20 PM Invited

Dynamic TEM In Situ Mechanical Testing: Characterization of Defects Motion at High Strain Rates: *Thomas Voisin*¹; Michael Grapes¹; Tian Li¹; Jonathan Ligda²; Nicholas Lorenzo²; Brian Schuster²; Melissa Santala³; Yong Zhang⁴; Geoffrey Campbell¹; Timothy Weihs⁴; ¹Lawrence Livermore National Laboratory; ²Army Research Laboratory; ³Oregon State University; ⁴Johns Hopkins University



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GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

Surface Protection and Spray Technology for Enhanced Materials Performance: Science, Technology, and Application — Aerosol, Sputtering, and Functional Coatings

Program Organizers: Kang Lee, NASA Glenn Research Center; Jun Song, McGill University; Yutaka Kagawa, The University of Tokyo; Dongming Zhu, NASA Glenn Research Center; Rodney Trice, Purdue University; Daniel Mumm, University of California, Irvine; Mitchell Dorfman, Oerlikon Metco (US) Inc.; Christian Moreau, Concordia University; Emmanuel Boakye, UES Inc.; Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory; Richard Chromik, McGill University; Stephen Yue, McGill University

Wednesday PM
October 17, 2018
Room: B234
Location: Greater Columbus Convention Center

Session Chairs: Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory

2:00 PM

Assessment of Ferromagnetic Properties of Materials Deposited by Aerosol Deposition: *Scooter Johnson*¹; Syed Qadri¹; Sanghoon Shin¹; ¹Naval Research Laboratory

2:20 PM

Corrosion Characterization of Thin Aluminium Films Deposited on Mild Steel Substrates by rf Magnetron Sputtering: *Fredrick Mwema*¹; Oluseyi Oladijo²; Esther Akinlabi¹; ¹University of Johannesburg, APK; ²Botswana International University of Science and Technology

2:40 PM

Applications of Thin Pure Aluminium Films Deposited by Sputtering Techniques: *Fredrick Mwema*¹; Oluseyi Oladijo²; Esther Akinlabi¹; ¹University of Johannesburg, APK; ²Botswana International University of Science and Technology

3:00 PM

Understanding of Droplets Dynamics and Deposition Area in Electro spraying by Experimental and Modeling Approaches: Xiong (Bill) Yu¹; *Zhuoying Jiang*¹; ¹Case Western Reserve University

3:20 PM Break

3:40 PM

Die Lubricant Characterization and Properties in High Pressure Die Casting Applications: *Chunlei Wang*¹; Charles Monroe¹; ¹University of Alabama at Birmingham

4:00 PM

Heat Treatment Optimization of Inconel 718 Cladding on Hot Forging Dies: *Aaron Washburn*¹; Matthew Willard¹; David Schwam¹; ¹Case Western Reserve University

Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications — Ultrafine Grained / Nanostructured / Composites / Hybrids

Program Organizers: Ali Yousefiani, Boeing Research And Technology; Troy Topping, California State University, Sacramento; Robert Dillon, Jet Propulsion Laboratory; Linruo Zhao, NRC Aerospace

Wednesday PM
October 17, 2018
Room: B235
Location: Greater Columbus Convention Center

Session Chair: Troy Topping, California State University, Sacramento

2:00 PM

Design and Development of Ultrafine-grained, High-strength Silver: *Vladilena Gaisina*¹; Ricardo Komai¹; Erik Sease²; Evander Ramos²; Suveen Mathaudhu²; James Saal¹; ¹QuesTek Innovations LLC; ²University of California, Riverside

2:20 PM

High Strength and Deformability of Super-strong Nanotwinned Al(Fe) Alloys: *Qiang Li*¹; Sichuang Xue¹; Jian Wang²; Haiyan Wang¹; Xinghang Zhang¹; ¹Purdue University; ²University of Nebraska–Lincoln

2:40 PM

Toward Understanding the Negative Influence of Oxygen in Nanograin Size Stability of Fe14Cr4Hf Alloy: *Peiman Shahbeigi Roodposhti*¹; Mostafa Saber²; Ronald Scattergood³; Sina Shahbazmohamadi¹; ¹University of Connecticut; ²Oregon Tech; ³North Carolina State University

3:00 PM

Densification and Flow Stress Analysis of Al-SiCp Metal Matrix Composites Processed by Direct Powder Forging: *Erica Bindas*¹; Jiwon Kim¹; John Lewandowski¹; Matthew Willard¹; Don Hashiguchi²; Kyung Chung³; ¹Case Western Reserve Univ; ²Materion Brush Inc. ; ³Materion Brush Inc.

3:20 PM Break

3:40 PM

Mechanical Anisotropy in Extruded Metal Matrix Composites: *Conrad Park*¹; Erica Bindas¹; Ji Xia¹; Don Hashiguchi²; Kyung Chung²; John Lewandowski¹; Matthew Willard¹; ¹Case Western Reserve University; ²Materion Brush Incorporated

4:00 PM

Nanoporous Stainless Steel with Structural Hierarchy: *Alexander Preston*¹; Kaka Ma¹; ¹Colorado State University

4:20 PM

Addressing the Need for Thermophysical Property Data of Metal and Alloys for New Material Development: *Boris Wilthan*¹; V. Diky¹; A. Kazakov¹; S. Townsend¹; Ken Kroenlein¹; ¹National Institute of Standards and Technology

WEDNESDAY PM

Additive Manufacturing of Metals: Microstructure and Material Properties — Jet Binder and Wire-based AM Processes

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

Thursday AM
October 18, 2018

Room: A214
Location: Greater Columbus Convention Center

Session Chair: Howard Kuhn, University of Pittsburgh

8:00 AM

Kinetics of Densification and Microstructural Evolution during Sintering of Binder Jet 3D Printed Alloy 625 Powders: *Amir Mostafaei*¹; Josh Porter¹; Pierangeli Rodriguez²; Markus Chmielus¹; ¹University of Pittsburgh

8:20 AM

Microstructure and Mechanical Properties of Solid-state Additive Friction Stir Processed Alloy 600 Claddings on 304L Stainless Steel: *Biswajit Dalai*¹; Vijay Vasudevan¹; Nanci Hardwick²; Jianqing Su²; Chase Cox²; Benjamin Sutton³; Nicholas Mohr³; Seetha Mannava¹; Young Pyun⁴; ¹University of Cincinnati; ²Aeroprobe Corp; ³EPRI; ⁴Sun Moon University

8:40 AM

Parameter Selection for Wire Arc Additive Manufacturing (WAAM) Process: *Lobna Wahsh*¹; Ahmed El-Shater²; Faress Hamdy²; Mahmoud Torky²; Hanadi Salem²; Ahmed Mansour²; Mohamed Azzam²; ¹American University in Cairo; ²American University in Cairo

9:00 AM

Deposition of Aluminum 4043 during Wire Arc Additive Manufacturing: *Paul Korinko*¹; Eric Krikkku¹; Andrew Duncan¹; Anna D'Entremont¹; John Bobbitt¹; Matthew Folsom¹; Matthew Van Swol¹; Poh-Sang Lam¹; William Housley¹; ¹Savannah River National Laboratory

9:20 AM

Additive Manufacturing of Ti-6Al-4V through Fused Filament Fabrication: *Matthew Dunstan*¹; James Paramore¹; Brady Butler¹; ¹United States Army Research Lab

9:40 AM

In-situ Microstructure Growth Characterization of Wire-fed Electron Beam Additively Manufactured Ti-6Al-4V Components: *Nathan Johnson*¹; Aaron Stebner¹; Branden Kappes¹; ¹Colorado School of Mines

10:00 AM Break

10:20 AM

Mechanical Properties and Microstructural Characterization of 308L Stainless Steel Processed via Wire Feed Electron Beam Additive Manufacturing: *Daniel Coughlin*¹; Matt Dvornak¹; Andrew Duffield¹; Patrick Hochanadel¹; John Carpenter¹; ¹Los Alamos National Laboratory

11:00 AM

The Porosity and Mechanical Behavior of 2219-Al Fabricated by Wire and Arc Additive Manufacturing: *Xuwei Fang*¹; Lijuan Zhang²; Hui Li²; Chaolong Li²; Bingheng Lu¹; ¹Xi'an Jiaotong University; ²National Innovation Institute of Additive Manufacturing, Xi'an

10:40 AM

Binder-Jet Sintered SAM Alloy vs. SAM Alloy Infiltrated with Bronze: *Rina Mudanyi*¹; Cameron Shackelford¹; Cindy Waters¹; Amy Elliott²; ¹North Carolina A&T State University; ²Oak Ridge National Laboratory

Additive Manufacturing of Metals: Microstructure and Material Properties — Performance of AM Materials

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

Thursday AM
October 18, 2018

Room: A215
Location: Greater Columbus Convention Center

Session Chair: Anthony Rollett, Carnegie Mellon University

8:00 AM

Enhanced Corrosion Response of Additive Manufactured over Wrought 316L Stainless Steel in Acidic Environment: *Jahangir Khan Lodhi*¹; Waseem Haider¹; Kashif Miraj Deen²; ¹Central Michigan University; ²University of British Columbia

8:20 AM

Fatigue Resistance of AlSi10Mg SLM Material Related to Microstructure's 5 Scales: Julius Domfang¹; *Yves Nador*¹; Gilbert Henaff²; Julien Nicolai³; Lionel Ridosz⁴; ¹ENSMA; ²École Nationale Supérieure de Mécanique et d'Aérotechnique; ³Prime / Univ Poitiers; ⁴Zodiac Aerospace

8:40 AM

High-temperature Performance of Selective Laser Melted Addalloy™, a L12-Precipitation-strengthened Aluminum Superalloy: *Joe Croteau*¹; Seth Griffiths²; Rolf Erni²; Marta Rossell²; Christian Leinenbach²; David Seidman³; David Dunand³; Nhon Vo¹; ¹NanoAl LLC; ²Empa; ³Northwestern University

9:00 AM

Investigation of the Molybdenum – Titanium System with Additive Manufacturing Methods: *Michael Niezgod*¹; Dan Thoma¹; John Perepezko¹; ¹University of Wisconsin Madison

9:20 AM

Property Development of New Generation Aluminum Materials via MELD™ Processing: *Wayne Daye*¹; Thomas Pelletiers¹; Nanci Hardwick²; Chase Cox²; ¹Kymera International; ²Aeroprobe Corporation

9:40 AM

Quantifying the Effect of Preferred Orientations on Response during Plane-Strain Indentation: *Mustafa Rifat*¹; Xi Gong¹; Guha Manogharan¹; Edward Demeter¹; Saurabh Basu¹; ¹Penn State

10:00 AM Break

10:20 AM

Role of Composition on Microstructure of Additively Manufactured Functionally Graded Titanium-chromium Alloys: Jonova Thomas¹; Deep Choudhuri²; Jon-Erik Mogonye³; *Srinivas Mantri*²; Thomas Scharf²; Rajarshi Banerjee²; ¹Purdue University; ²University of North Texas; ³Army Research Laboratory

10:40 AM

Additive Manufacture of Magnetically Graded Materials: *Felicity Freeman*¹; Alex Lincoln²; Al Lambourne³; Iain Todd¹; ¹University of Sheffield; ²University of Manchester; ³Rolls-Royce plc

11:00 AM

Gas Atomization and Additive Manufacturing of Al-Zn-Mg-Sc-Zr Alloy: *Le Zhou*¹; Holden Hyer¹; Sharon Park¹; Brandon McWilliams²; Kyu Cho²; Yongho Sohn¹; ¹Univ of Central Florida; ²U.S. Army Research Laboratory

11:20 AM

A Study of the Process-geometry Dependency of Material Characteristics in Thin Strut Features Fabricated via Laser Powder Bed Fusion Additive Manufacturing: Shanshan Zhang¹; *Li Yang*¹; ¹University of Louisville



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

Additive Manufacturing of Metals: Post Processing — Post Processing

Program Organizers: Ola Harrysson, North Carolina State University; Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; S. Babu, Indian Institute of Technology Madras

Thursday AM
October 18, 2018
Room: A216
Location: Greater Columbus Convention Center

Session Chair: Ulf Ackelid, Freemelt

8:00 AM

Comparison of HAZ Simulated Microstructures of As-printed and Wrought 17-4 Stainless Steel: *Franklyn Kellogg*¹; Andelle Kudzal²; Josh Taggart-Scarff²; Brandon McWilliams³; ¹SURVICE Engineering; ²ORAU; ³US Army Research Laboratory

8:20 AM

Developing Relationships between as Deposited Microstructure and Precipitation Strengthening in Additively Manufactured Materials: *Todd Palmer*; Scott Meredith¹; Andrew Iams¹; ¹Pennsylvania State University

8:40 AM

Gas-phase Alloying and Sintering Kinetics of 3D Printed Nickel Scaffolds: *Safa Khodabakhsh*¹; Ashley Paz y Puente¹; ¹University of Cincinnati

9:00 AM

How Can Digital Technologies and Craftsmanship Provide Solutions for the Heritage Sector?: *Ann-Marie Carey*¹; ¹School of Jewellery

9:20 AM

Microstructure and Properties of Additive Laser Powder Bed Fusion Processed and Heat-treated IN625 Alloy: *Aruneshwar Somasundaram*¹; Micheal Kattoura¹; Seetha Ramaiah Mannava¹; Vijay Vasudevan¹; ¹University of Cincinnati

9:40 AM

Microstructure of Binder Jet 3D Printed Ti-6Al-4V Parts after Sintering or Hot Isostatic Pressing: *Erica Stevens*¹; Samantha Schloder¹; Eric Bono²; David Schmidt¹; Markus Chmielus¹; ¹University of Pittsburgh; ²Carpenter Technology Corporation

10:00 AM Break

10:20 AM

Post-process Curing Effects on Conductivity of Additively Manufactured Silver Pastes for Electric Motor Applications: *Valerie Wiesner*¹; Michael Halbig¹; Mrityunjay Singh²; ¹NASA Glenn Research Center; ²Ohio Aerospace Institute

10:40 AM

Process Chain Optimization in the Case of SLM-based Tool Making: *Franz-Josef Villmer*¹; Olaf Elstermeyer²; ¹OWL UAS; ²Realizer GmbH, DMG Mori AG

11:00 AM

Production and Post Processing of a Hybrid Additive Manufacturing Heat Exchanger: *Adam Hehr*¹; Mark Norfolk¹; Justin Wenning¹; John Sheridan²; Scott Roberts³; Arthur Mastropietro³; ¹Fabrisonic LLC; ²Sheridan Solutions LLC; ³Jet Propulsion Laboratory

Advanced Manufacturing, Processing, Characterization, and Modeling of Functional Materials — Advanced Manufacturing II

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

Thursday AM
October 18, 2018
Room: B230
Location: Greater Columbus Convention Center

Session Chairs: C. Virgil Solomon, Youngstown State University; Mohammad Mahtabi, University of Tennessee at Chattanooga; Ajay Kumar P., University of Wisconsin-Milwaukee, Materials Dept; Parisa Bayatimalayeri, University of Toledo

8:00 AM Invited

Exploiting Severe Plastic Deformation during Orthogonal Cutting Processes to Prepare Mn-Al Base Alloys for Permanent Magnet Applications: *Jaehyuk Jo*¹; Vishwanadh Bathula¹; Subarna Khanal¹; Ravi Shankar¹; Hasso Weiland²; Jörg Wiezorek¹; ¹University of Pittsburgh; ²Arconic Inc.

8:40 AM

Numerical Modeling of Deformation Behavior of Lattice Structures 3D Printed from Inconel 718 and NiMnGa Powders: C. Virgil Solomon¹; *Stephen Isacco*¹; Rafaela Vannutelli¹; Christopher Barrett¹; Matthew Caputo¹; ¹Youngstown State University

9:00 AM

A Comparative Experimental Investigation of Electric Discharge Machining Process Variants: *Krishnakant Dhakar*¹; Akshay Dvivedi²; ¹Maulan Azad National Institute of Technology; ²Indian Institute of Technology Roorkee

9:20 AM

The Effect of Mold Temperature on Exudation in Heated Mold Continuous Casting Cu-15%Ni-8%Sn Alloy: *Jihui Luo*¹; ¹Yangtze Normal University

9:40 AM

First-principles Study on the Electronic, Optical and Thermodynamic Properties of La_xSr_{1-x}Co_yFe_{1-y}O_{3-d} (x, y =0.0 ~ 1.0) Perovskites: *Ting Jia*¹; Hua Hao²; Paul Ohodnicki¹; Benjamin Chorpening¹; Gregory Hackett¹; Zhi Zeng²; Yuhua Duan¹; ¹National Energy Technology Laboratory, United States Department of Energy; ²Key Laboratory of Materials Physics, Institute of Solid State Physics, Chinese Academy of Sciences

10:00 AM Break

10:20 AM

Large-scale Molecular-dynamics Simulations of Solid Phase Epitaxy in Si: *Kayo Kohno*¹; Manabu Ishimaru¹; ¹Kyushu Institute of Technology

10:40 AM

Pressure Development and Wear Analysis of Tapered Screw Extruder Biomass Briquetting Machines: Sunday Ojolo¹; *Ifeoluwa Orisaleye*¹; Sehinde Ajiboye¹; ¹University of Lagos

THURSDAY AM

**Advanced Steel Metallurgy: Products and Processing
— General Steel Session II**

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

Thursday AM
October 18, 2018

Room: A226
Location: Greater Columbus Convention Center

Session Chair: Daniel Baker, GM Global Propulsion Systems; Mingzhi Xu, Georgia Southern University

8:00 AM Invited

Nucleation of Graphite Particles Formed in Medium Carbon Steel after Graphitising Anneal: *Aqil Inam*¹; David Edmonds²; Rik Drummond-Brydson²; ¹University of the Punjab; ²University of Leeds

8:30 AM

An Investigation of the Machinability of Abrasion Resistant AR450 Steel: *Mark Emmendorfer*¹; Simon Lekakh¹; Laura Bartlett¹; Ronald O'Malley¹; Rick Bodnar²; Sunday Abraham²; Yufeng Wang²; Matthew Werner²; ¹Missouri University of Science & Technology; ²SSAB Americas

8:50 AM

Toughness and Separation Improvement for X70 Pipeline Steels: *Emily Mitchell*¹; Amy Clarke¹; Sven Vogel²; Enrico Lucon³; Kester Clarke¹; ¹Colorado School of Mines; ²Los Alamos National Lab; ³National Institute of Standards and Technology

9:10 AM

Cyclic Intercritical Heat Treatment of AISI 1045 Steel: *Srinath Bayya*¹; Saeed Saboury¹; ¹Bradley University

9:30 AM

Hydrogen Effects in Microstructure Development during Steel Processing: *Haoxue Yan*¹; Zhiyuan Liang²; Mohadeseh Mousavi¹; C. Cem Tasan¹; ¹Massachusetts Institute of Technology; ²Texas A&M University

9:50 AM

Effect of Fire on Mechanical Properties and Microstructure of Steel Bars Produced in Bangladesh: *Shubhrodev Bhowmik*¹; Rashidun Shaown¹; Sayem Shahriar¹; ¹Bangladesh University of Engineering and Technology

10:10 AM Break**10:30 AM**

Microstructure Evolution and Dynamic Recrystallization Kinetics under Heavy Reduction: *Ji Cheng*; Yang Qi; Zhu Miaoyong

10:50 AM

The Influence of Transformation Induced Plasticity on Damage Development in QP1500: *Concetta Pelligra*¹; Javad Samei¹; David Wilkinson¹; ¹McMaster University

**Advanced Steel Metallurgy: Products and Processing
— General Steel Session III**

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

Thursday AM
October 18, 2018

Room: A223
Location: Greater Columbus Convention Center

Session Chairs: Justin Raines, SSAB Americas; Charles Enloe, General Motors

8:00 AM

Electron and Atom Probe Microscopic Analysis of Inverse Bainite Transformation in Hypereutectoid Steels: *Rangasayee Kannan*¹; Yiyu Wang¹; Sudarsanam Babu²; Leijun Li¹; ¹University of Alberta; ²University of Tennessee

8:20 AM

Analysis of Orientation and Size of the Cylindrical Voids Inside Steel Blocks Using FEM and Ultrasonic Time of Flight Diffraction Technique: *Abolfazl Zolfaghari*¹; Davood Shahriari²; Amin Zolfaghari³; ¹Department of Mechanical Engineering, Tennessee Technological University; ²Department of Mechanical Engineering, École de Technologie Supérieure; ³Department of Mechanical Engineering, Ferdowsi University of Mashhad

8:40 AM

Reverse Transformation Behavior from Martensite to Austenite in Ni-C Steels Studied by In-situ SEM/EBSD Analysis: *Ooura Natsumi*¹; Kazuki Fujiwara¹; Kaori Kawano¹; Nobuhiro Tsuji²; ¹Nippon Steel & Sumitomo Metal; ²Kyoto University

9:00 AM

Steel Self-monitoring of Stress and defects by Capacitance Measurement, Enabled by the Electric Permittivity and Piezoelectricity of Steel: *Deborah Chung*¹; Kairong Shi¹; ¹State University of New York Buffalo

9:20 AM

Effect of SO₂ on Rust Evolution and Anti-corrosion Performance of Weathering Steel: *Guiqin Fu*¹; Dongliang Li¹; Miaoyong Zhu¹; ¹Northeastern University

9:40 AM

Development and Application of Anti-corrosion Steel for the Inner Bottom of Cargo Oil Tanks: *Xiaobing Luo*¹; Feng Chai¹; Hang Su¹; Caifu Yang¹; Hao Li¹; Yaqing Hou¹; Xuehui Chen¹; ¹Central Iron and Steel Research Institute

10:00 AM Break**10:20 AM**

Thermodynamics Study of Siderite Fluidized Magnetization Roasting Process: *Qiang Zhao*¹; Jilai Xue¹; ¹University of Science and Technology Beijing

10:40 AM

Flow Field Simulation Study on the Iron Ore Particle in Fluidized Magnetization Roasting Reactor: *Qiang Zhao*¹; Jilai Xue¹; ¹University of Science and Technology Beijing

OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

Advances in Solid Oxide Fuel Cell Technology — SOFC Research and Development

Program Organizers: Scott Swartz, Nexceris LLC; Matthew Seabaugh, Nexceris LLC; Jeff Stevenson, Pacific Northwest National Laboratory

Thursday AM
October 18, 2018
Room: D281
Location: Greater Columbus Convention Center

Session Chairs: Jason Nicholas, Michigan State University; Xiao-Dong Zhou, University of Louisiana at Lafayette

8:00 AM

Characterization of Ceramic Oxide Microstructure with Picosecond Ultrasonic: *Yuzhou Wang*¹; Marat Khafizov¹; David Hurley²; Zilong Hua²; Gaofeng Sha¹; ¹Ohio State University; ²Idaho National Laboratory

8:20 AM

Optimised Composite Cathodes for SOFC: Guttorm Syvertsen-Wiig¹; Sophie Labonnote-Weber¹; Maria Angeltveit²; *Andreas Richter*¹; Kjell Wiik²; ¹Cerpotech; ²Norwegian University of Science and Technology

8:40 AM

Engineering of Microstructures of Protonic Ceramics by A Novel Rapid Laser Reactive Sintering for Ceramic Energy Conversion Devices: Shenglong Mu¹; Zeyu Zhao¹; Jincheng Lei¹; Yuzhe Hong¹; Tao Hong¹; Dong Jiang¹; Yang Song¹; William Jackson¹; Kyle Brinkman¹; Fei Peng¹; Hai Xiao¹; *Jianhua "Joshua" Tong*¹; ¹Clemson University

9:00 AM

Fabrication of LSGM Thin Films on Porous Anode Supports by Pulsed Laser Deposition for IT-SOFC: *Subhajit Pan*¹; Koushik Biswas¹; ¹Indian Institute of Technology Kharagpur

9:20 AM

Improvement of Cathode Materials for Proton Conducting Intermediate Temperature Solid Oxide Fuel Cells: *Shichen Sun*¹; Zhe Cheng¹; ¹Florida International University

9:40 AM

Effect of Nickel Catalyst Impregnation on Ni-YSZ Cermet Electrode Polarization Using Symmetric Cells: *Boshan Mo*¹; Paul Gasper¹; Yan Chen Lu¹; Soumendra Basu¹; Uday Pal¹; Srikanth Gopalan¹; ¹Boston University

10:00 AM Break

10:20 AM

Redox Tolerant Anodes in SOFC Designs Using a Freeze Cast Tubular Support: *Benjamin Emley*¹; ¹University of Houston

10:40 AM

Rare Earth Nickelate Cathodes for SOFCs in High Oxygen Partial Pressure environments: *Jane Banner*¹; Srikanth Gopalan¹; ¹Boston University

11:00 AM

Low Temperature Silver-based Brazing of Stainless Steel to Gadolinium Doped Ceria for SOFC Applications: Yuxi Ma¹; Quan Zhou¹; *Jason Nicholas*¹; ¹Michigan State University

11:20 AM

Sintering and Electrical Conductivity Properties of La_{1-x}Cax(Cr_{0.33}Fe_{0.33}Ni_{0.33})O₃ For SOFC Applications: Sai Gajjala¹; *Rasit Koc*¹; ¹Southern Illinois University Carbondale

11:40 AM

Short Stack Kit for the Open Flange™ Set-up: Pierre Coquoz¹; Noelia Coton¹; *Raphael Ihringer*¹; ¹Fiixell Sarl

Advances in Surface Engineering — Functional Coatings/Films/Surface Features

Program Organizers: Brian Skinn, Faraday Technology, Inc.; Timothy Hall, Faraday Technology, Inc.; Sandip Harimkar, Oklahoma State University; Michael Roach, University of Mississippi Medical Center; Rajeev Gupta, The University of Akron

Thursday AM
October 18, 2018
Room: B144/145
Location: Greater Columbus Convention Center

Session Chair: Santosh Vijapur, Faraday Technology, Inc.

8:00 AM Invited

Surface Modification of Carbon Nanotube Carpets for Wettability Tailoring: *Kimia Kiaei*¹; Lvmeng He¹; *Sharmila Mukhopadhyay*¹; ¹Wright State University

8:40 AM

Carbon Nanotube Dispersion in Solvents and Polymer Solutions: Mechanisms, Assembly, and Preferences: Chandrani Pramanik¹; Jacob Gissing¹; Satish Kumar²; *Hendrik Heinz*¹; ¹University of Colorado Boulder; ²Georgia Institute of Technology

9:00 AM

Influence of Impaction Velocity on Films Deposited by High Speed Aerosol Deposition of Ag: *Jeremiah McCallister*¹; Michael Becker¹; John Keto¹; Desiderio Kovar¹; ¹University of Texas at Austin

9:20 AM

Thermal Conductivity of Poly (3,4-ethylenedioxythiophene) Films Engineered by Oxidative Chemical Vapor Deposition (oCVD): *Phil Smith*¹; B. Reesja-Jayan¹; ¹Carnegie Mellon University

9:40 AM

Performance Improvement of Cathode Electrodes in Lithium Ion Batteries by Nanoscale Surface Engineering via Chemical Vapor Deposition Polymerization: *Laisuo Su*¹; Phil Smith¹; B. Jayan¹; ¹Carnegie Mellon University

10:00 AM

Electro Chemical Characterization of Mechanically Exfoliated Graphite Based Organic Dye Sensitized Solar Cell (DSSC): Muhammad Manzoor¹; *Muhammad Butt*¹; Tahir Ahmad¹; Muhammad Kamran¹; ¹University of the Punjab

Ceramics and Glasses Simulations and Informatics — Atomistic Simulations

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; Efrain Hernandez-Rivera, U.S. Army Research Laboratory

Thursday AM
October 18, 2018
Room: A113
Location: Greater Columbus Convention Center

Session Chairs: Mathieu Bauchy, University of California, Los Angeles; John Mauro, The Pennsylvania State University

8:00 AM Keynote

Genesis of "Free" Carbon in Silicon Oxycarbide Ceramics: *Peter Kroll*¹; ¹University of Texas at Arlington

8:40 AM

Modeling and Simulation of Silicon Oxycarbide Ceramics Using a Reactive Force Field (ReaxFF): *Iliia Ponomarev*¹; Peter Kroll¹; ¹The University of Texas at Arlington

THURSDAY AM

9:00 AM

Predicting Reduction Conditions and Temperature Dependent Properties of Mayenite Electride by Density Functional Theory Calculations: *Zheng Yu*¹; Bu Wang²; ¹University of Wisconsin Madison; ²UW-Madison

9:20 AM

Phonon Engineering for Tunable Thermal Expansion of RE-silicate EBC Candidates: *Jingyang Wang*¹; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Research,

9:40 AM

Fission Product Diffusion in Silicon Carbide: A Computational Study: *Nanjun Chen*¹; Qing Peng¹; Fei Gao¹; Zhijie Jiao¹; Isabella Van Rooyen²; ¹University of Michigan; ²Idaho National Laboratory

10:00 AM Break

10:20 AM

Transparency Enhancement for SrVO₃ by SrTiO₃ Mixing: A First-principles Study: Zhi Liu¹; Nikolas Podraza¹; *Sanjay Khare*¹; Pankaj Sarin²; ¹University of Toledo; ²Oklahoma State University

10:40 AM

MXenes with Wide Band Gaps and Novel Magnetic Properties: *Weiwei Sun*¹; Yu Xie²; Paul Kent¹; ¹Oak Ridge National Laboratory; ²Rice University

11:00 AM

Accurate Simulation of Oxides and Hydroxides Up to the Large Nanometer Scale: *Krishan Kanhaiya*¹; Michael Nathanson¹; Hendrik Heinz¹; ¹University of Colorado Boulder

11:20 AM

Effect of Water Vapor Pressure on Phase Transformation Rate of t'-Yttria Stabilized Zirconia: *Amir Saeidi*¹; Daniel Mumm¹; ¹University of California Irvine

11:40 AM

Ion Irradiation and Microstructure Alterations of Ceramic Materials: *Eva Zarkadoula*¹; Yanwen Zhang¹; William Weber²; ¹Oak Ridge National Laboratory; ²University of Tennessee

Characterization & Methods in Failure Analysis — FAS-IMS Failure Analysis Applications of Microanalysis, Microscopy, Metallography & Fractography

Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

Thursday AM
October 18, 2018

Room: A211
Location: Greater Columbus Convention Center

Session Chairs: Daniel Dennies, DMS, Inc.; Amber Dalley, RJ Lee Group; James Lane, Professional Analysis and Consulting Inc; Burak Akyuz, Applied Technical Services Inc; Brett Miller, IMR Metallurgical Services; Andrew Havics, pH2, LLC

8:00 AM Invited

In-situ Micro Mechanical Testing on High-strength Nanotwinned Al Alloys and Gradient Structured Ni Alloys: *Qiang Li*¹; Jie Ding¹; Sichuang Xue¹; Haiyan Wang¹; Xinghang Zhang¹; ¹Purdue University

8:40 AM Invited

Improvements in EDS Design and the Impact on Analyzing Polymer Materials: *Michael Hjelmstad*¹; ¹Oxford Instruments

9:00 AM

Gamification of Metallographic Lab Practice Teaching by Failure Analysis: *Véronique Vitry*¹; Fabienne Delaunois¹; ¹UMONS

9:20 AM

The Metallurgy of Fire Cause and Origin Analysis: *Kale Stephenson*¹; Brad James¹; ¹Exponent

9:40 AM Invited

Failure Analysis of a Dissimilar Metal Braze Joint: *Brett Miller*¹; Phillip Swartzentruber¹; Justin Barnes¹; ¹IMR Test Labs- Louisville

10:00 AM Break

10:20 AM

Failure Analysis of Heating Coils: *Abdulmohsen Alsahli*¹; Abdelgader Abdelgalil¹; Abdulaziz Al-Meshari¹; ¹Saudi Basic Industries Corp. (Sabic)

10:40 AM

Failure Analysis of T91 Grade Reheater Tube of a Supercritical Power Plant: *Ravi Kumar Yadavalli*¹; Anand Varma¹; ¹NTPC LTD

11:00 AM

Metallurgical Evaluation of a 9310 Steel Bevel Gear Used for a Commercial Aircraft Engine Application: *Jonathan Morales*¹; ¹GE Aviation

11:20 AM

Oil Heater Tube Failure due to Excessive Unintended Carburization: *David Williams*¹; ¹Engineering Design & Testing Corp.

Deformation and Transitions at Grain Boundaries VI — Gradients near Grain Boundaries

Program Organizers: Thomas Bieler, Michigan State University; Shen Dillon, University of Illinois; Saryu Fensin, Los Alamos National Laboratory; Jian Luo, University of California San Diego; Douglas Spearot, University of Florida

Thursday AM
October 18, 2018

Room: A123
Location: Greater Columbus Convention Center

Session Chairs: Bing Liu, Xi'an Jiaotong University; Jicheng Gong, Oxford University

8:00 AM

After Six Decades of Hall-petch Relationship: A New Exponential Function for Better Correlation of Grain Size Effect on Strength of Iron/Steel over Multiple Length Scales: *K. S. Ravi Chandran*¹; ¹University of Utah

8:20 AM

Anisotropy Grading Enables Simultaneous Increase in Strength and Ductility in Nanostructured Alloys: *Seyedeh Mohadeseh Taheri Mousavi*¹; Dingshun Yan²; Dierk Raabe³; C. Cem Tasan¹; ¹MIT; ²Institute of Mechanics, Chinese Academy of Sciences; ³Max-Planck-Institut für Eisenforschung

8:40 AM

Leveraging FFT Based Crystal Plasticity Models to Predict Texture Evolution and Activity of Deformation Modes in NiCoCr Medium Entropy Alloy: *Supriyo Chakraborty*¹; Connor Slone¹; Michael Mills¹; Stephen Niezgodka¹; ¹The Ohio State University

9:00 AM

Mechanical Behavior Study of Structurally Gradient Ni Alloy by In-situ Micropillar Compression Tests: *Jie Ding*¹; Qiang Li¹; Jin Li¹; Sichuang Xue¹; Zhe Fan²; Haiyan Wang¹; Xinghang Zhang¹; ¹Purdue University; ²Oak Ridge National Lab

9:20 AM

Microstructure Analysis of Ti-6Al-4V Chips Obtained from Turning Using Electron Backscatter Diffraction Mapping: *Jiawei Lu*¹; Thomas Bieler¹; Patrick Kwon¹; ¹Michigan State University



OCTOBER 14 – 18, 2018

GREATER COLUMBUS CONVENTION CENTER

COLUMBUS, OHIO, USA

9:40 AM Invited

Size Effect in Sn Grain Boundary Sliding: *Jicheng Gong*¹; Angus Wilkinson¹; ¹Materials Department, Oxford University

10:10 AM Break

10:30 AM Invited

Characterization of Interface Dislocations: *Jian Wang*¹; ¹University of Nebraska–Lincoln

11:00 AM

The Effect of Grain Size, Parent Orientation and Loading History on Crystallographic Misorientation after Deformation in Two BCC Titanium Alloys: *Vahid Khademi*¹; Carl Boehlert¹; Thomas Bieler¹; ¹Michigan State University

11:20 AM

The Role of Phase Boundaries in Damage Behavior of Metastable Dual-phase High-entropy Alloy: An In-situ SEM/EBSD Investigation: *Shaolou Wei*¹; Jinwoo Kim¹; Cemal Tasan¹; ¹Massachusetts Institute of Technology

11:40 AM

Deformation Accommodation at Triple Junctions in Columnar-grained Nickel: *Mingjie Li*¹; David Duquette¹; Ying Chen¹; ¹RPI

12:00 PM

Formation of the Grain Boundary Structure of Low-alloyed Steels in the Process of Plastic Deformation: *Sergey Shejko*¹; George Sukhomlin²; Valerii Mishchenko³; Vadim Shalomoev¹; Valentina Tretiak¹; ¹Zaporizhzhya National Technical University; ²Pridneprovsk State Academy of Civil Engineering and Architecture; ³Zaporozhye National University

Eco-Friendly and Sustainable Ceramics — Innovative Sustainable Building Materials

Program Organizers: Enrico Bernardo, University of Padova; Henry Colorado, Universidad De Antioquia; Ivo Dlouhy, Institute of Physics of Materials, Academy of Sciences of the Czech Republic; Aldo Boccaccini, University of Erlangen-Nuremberg; Antonio Pedro Oliveira, Federal University of Santa Catarina; Isabella Lancellotti, Università di Modena e Reggio Emilia; Alexander Karamanov, Bulgarian Academy of Sciences Institute of Physical Chemistry “Rostislav Kaischew”; Vilma Ducman, Slovenian National Building and Civil Engineering Institute

Thursday AM
October 18, 2018

Room: A114
Location: Greater Columbus Convention Center

Session Chairs: Francois Mear, Université Lille1; Ronan Lebullenger, Université de Rennes 1

8:00 AM Introductory Comments

8:20 AM

Mechanical and Fracture Performance of Cellulose Fibers Based Geopolymeric Composite Incorporating Wastes: *Gianmarco Taveri*¹; Ivo Dlouhy¹; ¹Institute of Physics of Materials (IPM)

8:40 AM

Marble-like Cordierite-containing Glass-ceramics from ‘Reactive Sinter-crystallization’ of Recycled LCD Glass and Engineered Additives: *Enrico Bernardo*¹; Acacio Rincon Romero¹; Yuta Nagano²; Ken Chou²; ¹University of Padova; ²Nippon Electric Glass Co., Ltd

9:00 AM

Production of Low-temperature Stoneware Tiles with Borosilicate Glass Waste as Flux: *Magdalena Lassinantti Gualtieri*¹; Consuelo Mugoni¹; Denia Mazzini²; Cristina Siligardi¹; ¹University of Modena and Reggio Emilia, Department of Engineering “Enzo Ferrari”; ²Colorobbia Italia S.P.A.

9:20 AM

Microwave Process Development of the Municipal Solid Waste Incinerator Bottom Ash: *Georgia Flesoura*¹; Beatriz Garcia-Banos²; Jose Manuel Catala-Civera²; Jozef Vleugels¹; Yiannis Pontikes¹; ¹KU Leuven; ²Universitat Politècnica de Valencia

9:40 AM

Upcycling of Porcelain Stoneware Polishing Waste into Highly Porous Ceramic Foams: Patricia Rabelo Monich¹; Acacio Rincon Romero¹; Federico Bottaro¹; *Enrico Bernardo*¹; ¹University of Padova

10:00 AM

Fatigue Mechanisms of Lead Free (Bi1/2Na1/2)TiO3-BaTiO3 Piezoceramic System: *xi shi*¹; Nitish Kumar¹; Mark Hoffman¹; ¹University of New South Wales

Fast/Ultrafast Characterization of Irreversible Transformations in Materials with X-rays and Electrons — Fast TEM Imaging - Phase Transformation and Beyond

Program Organizers: Tian Li, Lawrence Livermore National Laboratory; Tao Sun, Argonne National Laboratory; Anders Madsen, European XFEL

Thursday AM
October 18, 2018

Room: B246
Location: Greater Columbus Convention Center

Session Chair: Tian Li, Lawrence Livermore National Laboratory

8:00 AM Invited

Rapid Solidification of Al-based Alloys Using In-situ Dynamic Transmission Electron Microscopy: *Joseph McKeown*¹; Amy Clarke²; Christian Leinenbach³; Seth Griffiths³; John Roehling¹; Jörg Wiezorek⁴; Manyalibo Matthews¹; ¹Lawrence Livermore National Laboratory; ²Colorado School of Mines; ³Empa; ⁴University of Pittsburgh

8:30 AM Invited

New Insights into Metallic Alloy Microstructural Evolution by In-situ Characterization: *Amy Clarke*¹; Joseph McKeown²; Damien Tournet²; Seth Imhoff⁴; Paul Gibbs⁴; John Roehling²; Kamel Fezzaa⁵; Tao Sun⁵; Francisco Coury¹; Joseph Jankowski¹; Adam Stokes¹; Yaofeng Guo¹; Dan Coughlin⁴; Michelle Espy⁴; Frank Merrill⁴; Theron Rodgers⁶; Jonathan Madison⁶; Alain Karma⁷; ¹Colorado School of Mines; ²Lawrence Livermore National Laboratory; ³IMEDA Materials Institute; ⁴Los Alamos National Laboratory; ⁵Argonne National Laboratory; ⁶Sandia National Laboratories; ⁷Northeastern University

9:00 AM

Transmission Electron Microscopy Study of the Transition from Cooperative Two-phase Growth to Partitionless Single-phase growth in Hypo-eutectic Al-Cu Alloys during Rapid Solidification: *Jorg Wiezorek*¹; Joseph McKeown²; Vishnawadh Bathula¹; ¹University of Pittsburgh; ²Lawrence Livermore National Laboratory

9:20 AM

Observing Nanometer-scale Dendrite Growth in Aluminum Alloys: *John Roehling*¹; Tomorr Haxhimali¹; Aurélien Perron¹; Adam Stokes²; Amy Clarke²; Manyalibo Matthews¹; Joseph McKeown²; ¹Lawrence Livermore National Laboratory; ²Colorado School of Mines

THURSDAY AM

9:40 AM Invited

Measuring Crystal Growth Rates in an Amorphous Ag-In-Sb-Te Phase-change Material over Large Temperature Ranges Using In-situ Microscopy Techniques: Victoria Bird¹; Al Rise¹; Khim Karki²; Daan Hein Alsem²; Geoffrey Campbell³; *Melissa Santala*¹; ¹Oregon State University; ²Hummingbird Scientific; ³Lawrence Livermore National Laboratory

10:00 AM

Dynamic TEM Characterization of a Liquid-mediated Nucleation Mechanism for Explosive Crystallization of Amorphous Germanium: *Garth Egan*¹; Tae Wook Heo¹; Geoffrey Campbell¹; ¹Lawrence Livermore National Laboratory

10:20 AM Break**10:40 AM Invited**

Dynamic Investigation of Energetic Materials with Electron Microscopy: *Volkan Ortalan*¹; ¹Purdue University

11:10 AM Invited

Characterization of Defects Motion at High Strain Rate In-situ Inside a TEM: *Thomas Voisin*¹; Michael Grapes¹; Tian Li¹; Jonathan Ligda²; Nicholas Lorenzo²; Brian Schuster²; Melissa Santala³; Yong Zhang⁴; Geoffrey Campbell¹; Timothy Weihs⁴; ¹Lawrence Livermore National Laboratory; ²Army Research Laboratory; ³Oregon State University; ⁴Johns Hopkins University

11:40 AM

Polymorphic Reactions and In-situ Single Crystal Metal Oxide Nanowire Formation in the TEM: *Pelagia Gouma*¹; ¹The Ohio State University

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

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

Thursday AM
October 18, 2018

Room: A122
Location: Greater Columbus Convention Center

Session Chair: Carol Handwerker, Purdue University

8:00 AM

Modeling of Interfacial Plasticity: *Huseyin Sehitoglu*¹; Sertan Alkan¹; ¹University of Illinois

8:20 AM

Liquid/Substrate Interface for the Heterogeneous Nucleation in Grain Refinement of Alloys: *Yanfeng Han*¹; ¹Shanghai Jiao Tong University

8:40 AM

Microstructure Evolution in a Binary Alloy under External Magnetic and Elastic Field : A Phase-field Study: *Rupesh Chafle*¹; Somnath Bhowmick¹; Rajdip Mukherjee¹; ¹Indian Institute of Technology, Kanpur

9:00 AM

Triple Junction Structure and Carbide Precipitation in Inconel 600 Alloy: *Sandeep Sahu*¹; Shashank Shekhar¹; ¹Indian Institute of Technology Kanpur

9:20 AM

Triple Junction Energy in Nickel: *Mingjie Li*¹; David Duquette¹; Ying Chen²; ¹Rensselaer Polytechnic Institute (RPI); ²Rensselaer Polytechnic Institute

9:40 AM

Multiscale Analysis for Clarification of Silver-alumina Bonding Mechanism: *Hajime Ashida*¹; Tomoki Matsuda¹; Tomokazu Sano¹; Akio Hirose¹; ¹Osaka University

10:00 AM Break**10:20 AM Invited**

Computational Design of Metal Oxides to Enhance the Wetting and Adhesion of Silver-based Brazes on Yttria-Stabilized-Zirconia: *Thanaphong Phongpreecha*¹; Jason Nicholas¹; Thomas Bieler¹; Yue Qi¹; ¹Michigan State University

10:40 AM

Atomistic Modeling of La³⁺ Doping Segregation Effect on Nanocrystalline Yttria-stabilized Zirconia: *Shenli Zhang*¹; Haoyan Sha¹; Ricardo Castro¹; Roland Faller¹; ¹University of California, Davis

11:00 AM

Modeling 3D Dendritic Solidification Using Lattice Boltzmann Method with Multiple Grids: *Elaheh Dorari*¹; Mohsen Eshraghi²; Sergio Felicelli¹; ¹The University of Akron; ²California State University

11:20 AM

A Discrete Dislocation Loop Based Model to Study Elastic Fields Due to a Twin: *Yubraj Paudel*¹; Christopher Barrett¹; Haitham El Kadiri¹; ¹Mississippi State University

Joining of Advanced and Specialty Materials (JASM XX) — Dissimilar Materials Joining

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

Thursday AM
October 18, 2018

Room: C171
Location: Greater Columbus Convention Center

Session Chairs: Zhenzhen Yu, Colorado School of Mines; Judy Schneider, University of Alabama At Huntsville

8:00 AM

Characterization of Dissimilar Metal Welds between Low Alloy Steel Butter Welds and Grade F65 Steel Using Alloy 625 Filler Wire: *Ryan Buntain*¹; ¹Ohio State University

8:20 AM

Development of Graded Transition Joints for Avoiding Failure of Dissimilar Welds in High Temperature Service: Jonathan Galler¹; *John DuPont*¹; ¹Lehigh University

8:40 AM

High Temperature Mechanical Behavior near the Fusion Boundary in Grade 91 Steel Dissimilar Metal Welds: *Michael Kuper*¹; Boian Alexandrov¹; Joshua Burgess²; ¹Ohio State University; ²GE Power

9:00 AM

Microstructural Evolution of Dissimilar Metal Welds Involving Grade 91: *Sean Orzolek*¹; John DuPont¹; John Seifert²; ¹Lehigh University; ²Electric Power Research Institute

9:20 AM

Microstructural Characterization of Low Alloy Steel Girth Welds for Joining of Internally Clad X65 Pipes: *Alejandro Alvarez*²; Boian Alexandrov¹; ¹The Ohio State University



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9:40 AM

Improving Dissimilar Titanium-stainless Steel Fiber Laser Joint Strength through the Changing of Single Interlayer Thickness: *Seyed Reza Elmi Hosseini*¹; Kai Feng²; Pulin Nie²; Ke Zhang²; Jian Huang²; Zhuguo Li²; Hiroyuki Kokawa²; ¹Shanghai Key Laboratory of Materials Laser Processing and Modification; ²Shanghai Key Laboratory of Materials Laser Processing and Modification, School of Materials Science and Engineering, Shanghai Jiao Tong University

10:00 AM Break

10:20 AM

Effect of Electrode Material on Dissimilar Joints between Grade 70 SA-516 and Grade B SA-517 Carbon Steels: *Fahad Riaz*¹; Muhammad Kamran¹; Atif Makhdoom¹; Tahir Ahmad¹; Faran Bilal¹; ¹University Punjab Lahore

10:40 AM

Can Polymer be Welded to Metal?: *Fengchao Liu*¹; Pingsha Dong¹; Wei Lu¹; Kai Sun¹; ¹University of Michigan

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

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

Thursday AM
October 18, 2018

Room: D181
Location: Greater Columbus Convention Center

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

8:00 AM Introductory Comments

8:40 AM

The Effect of Core Size and Coating Layers on the Hyperthermia Performance of Iron Oxide, Manganese Ferrite, Magnesium Ferrite and Strontium Ferrite Superparamagnetic Nano Particles: *Celaletdin Ergun*¹; Mona Nejatpour¹; Esra Alveroglu¹; Yakup Böke¹; ¹Istanbul Technical University

9:00 AM

Two-dimensional Chiral-chain Van Der Waals Crystal Tellurene for High Performance Photothermal Conversion: *Ruoxing Wang*¹; Wenzhuo Wu¹; ¹Purdue University

9:20 AM

Understanding the Mechanism of TiO₂ Nanotubes Formation at Low Potentials (= 8 V) through Electrochemical Methods: *Umair Shah*¹; Waseem Haider¹; ¹Central Michigan University

9:40 AM

On the Design of Novel Particulates from MAX Phases: *Surojit Gupta*¹; ¹University of North Dakota

10:00 AM Break

10:20 AM

Nanoscale Materials for Catalysis, Synthetic Fuels and for Chemical Energy Conversion: *Khurram Joya*¹; ¹KFUPM

10:40 AM

Novel, Non-toxic Graphene Quantum Dots for Cancer-imaging and Diagnostic Systems: *Suparnamaaya Prasad*¹; ¹Massachusetts Institute of Technology

11:00 AM Concluding Comments

Next Generation Biomaterials — Biomaterials VI

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

Thursday AM
October 18, 2018

Room: D182
Location: Greater Columbus Convention Center

Session Chair: Abhinav Acharya, Arizona State University

8:00 AM Invited

Localized Multi-component Delivery Platform Generates Local and Systemic Anti-tumor Immunity: *Abhinav Acharya*¹; ¹University of Pittsburgh

8:20 AM

Reactivation of Antibiotics with Silver-doped Bioactive Glass-ceramic Particles against MRSA: *Natalia Pajares*¹; Neal Hammer¹; Xanthippi Chatzistavrou¹; ¹Michigan State University

8:40 AM

In-vitro Testing of the Antibacterial Activity, Moisture Uptake and Cell Cytotoxicity of Nylon Coated Ultra-high Molecular Weight Polyethylene Biomaterial: *Nancy Hassanein*¹; Ali Nassar¹; Habiba Bougherara²; Asma Amleh¹; ¹American University in Cairo; ²Ryerson University

9:00 AM

Synthesis and Characterization of Antibacterial Newberyite (NB) Particulates: *Prabaha Sikder*¹; Sarit Bhaduri¹; ¹University of Toledo

9:20 AM

Multi Walled Carbon Nanotube Carpets as Scaffolds for Accelerated Neuronal Cell Growth: *Soham Parikh*¹; Debra Mayes¹; Sharmila Mukhopadhyay¹; ¹Wright State

9:40 AM

Development of Single-phase, Antibacterial Tri-magnesium Phosphate Hydrate Coatings on Polyetheretherketone (PEEK) for Effective Treatment against Surgical Site Infections (SSIs): *Prabaha Sikder*¹; Sarit Bhaduri¹; ¹University of Toledo

10:00 AM Break

10:20 AM

Surface-enhanced Raman Detection of Glucose on Different Substrates for Biosensing Applications: *Laila Alqarni*¹; Biao Leng¹; ¹New Jersey Institute of Technology

10:40 AM

Preparation of Microalgal EPS/PVA Blend Nanofibers Reinforced with Graphene for Waste Water Remediation: *Adarsh Bafana*¹; Shishir Kumar¹; Prasad Pawar¹; Ashiqur Rahman¹; Clyaton Jeffries¹; ¹Lamar University

11:00 AM

Characterization and Bioactivity Test in CEL2 Bioactive Glass-ceramic Porous Scaffolds Loaded with Chitosan Microspheres: *Esmeralda Villicana*¹; Ena Aguilar²; ¹Universidad Michoacana de San Nicolas de Hidalgo; ²Universidad Michoacana de San de Hidalgo

THURSDAY AM

Phase Transformations in Ceramics: Science and Applications — Phase Transformations in Ceramics: Science and Applications - Processing-Microstructure-Properties II/Theory

Program Organizers: Waltraud Kriven, University of Illinois at Urbana-Champaign; Pankaj Sarin, Oklahoma State University; Yu Zhong, Worcester Polytechnic Institute

Thursday AM
October 18, 2018

Room: A124
Location: Greater Columbus Convention Center

Session Chairs: Yu Zhong, Florida International University; Anton Van Der Ven, University of California

8:00 AM

Study of the Cofactor Conditions in ZrO₂-Based Shape-memory Ceramics: *Edward Pang*¹; Alan Lai¹; Srikanth Patala²; Christopher Schuh¹; ¹Massachusetts Institute of Technology; ²North Carolina State University

8:30 AM

Shape Memory Ceramics: Understanding Functionality through Martensitic Transformation: *Hunter Rauch*¹; Hang Yu¹; ¹Virginia Tech

9:00 AM

Understanding the Role of Microwave Heating on the Crystallization Behavior, Microstructure Formation and Mechanical Response of ZrO₂-Containing SiO₂ – MgO – Al₂O₃ – K₂O – B₂O₃ – F Mica Glass-ceramics: *Shibayan Roy*¹; Mrinmoy Garai²; Sunil Yadav²; Atiar Molla³; ¹Indian Institute of Technology (IIT), Kharagpur; ²Materials Science Centre, Indian Institute of Technology (IIT), Kharagpur; ³Glass Division, CSIR-Central Glass and Ceramic Research Institute, Kolkata

9:30 AM Invited

Unraveling Phase Transformation Mechanisms in Ceramic Electrode Materials of Li, Na and Mg Batteries: *Anton Van Der Ven*¹; ¹University of California

10:00 AM Break

10:30 AM Invited

The Diffuse Critical Point and Enhancement of the Electrocaloric and Electromechanical Effect in Relaxor Ferroelectric Ceramics: Nikola Novak¹; Brigita Rozic¹; Rasa Pirc¹; *Zdravko Kutnjak*¹; ¹Jozef Stefan Institute

11:00 AM

Electronic and Optical Properties of Vanadium Oxides from First Principles: *Nathan Szymanski*¹; Terence Liu¹; Tim Alderson¹; Nikolas Podraza¹; Pankaj Sarin²; Sanjay Khare¹; ¹University of Toledo; ²Oklahoma State University

11:30 AM Invited

Universal Link of Magnetic Exchange and Structural Behavior under Pressure in Chromium Spinel: Ilias Efthimiopoulos¹; Indiras Khatri²; Terence Liu²; *Sanjay Khare*²; Pankaj Sarin³; Vladimir Tsurkan⁴; Alois Loidl⁴; Dongzhou Zhang⁵; Nathan Szymanski²; ¹Oakland University; ²University of Toledo; ³Oklahoma State University; ⁴University of Augsburg; ⁵University of Hawaii

Small-scale Properties of Materials and Length-scale Phenomena — Structure II

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

Thursday AM
October 18, 2018

Room: A121
Location: Greater Columbus Convention Center

Session Chairs: Jessica Krogstad, University of Illinois at Urbana-Champaign; Meysam Haghshenas, University of North Dakota

8:00 AM Invited

Interlayer Confinement Phenomena and Thermodynamics – Structure – Property Relations in Layered Double Hydroxide Nanostructures: *Di Wu*¹; Gengnan Li¹; Dantong Qiu¹; Chen Yang¹; ¹Washington State University

8:20 AM

Time-dependent Mechanical Properties of Lithium Metal Studied by Nanoindentation: *Yikai Wang*¹; Xingcheng Xiao²; Yang-Tse Cheng¹; ¹University of Kentucky; ²Chemical and Materials Systems, General Motors Global Research and Development Center

8:40 AM Invited

On Determining Stress-Strain Curves and the Fracture Toughness of Metal Feedstock Powder for Additive Manufacturing with Nanoscale Instrumented Indentation Testing: *Bryer Sousa*¹; Derek Tsaknopoulos¹; Victor Champagne²; Danielle Cote¹; ¹Worcester Polytechnic Institute; ²US Army Research Laboratory

9:00 AM Invited

Synthesis of Two-dimensional Transition Metal Nitrides for Energy Storage and Beyond: *Xu Xiaojiao*¹; Yury Gogotsi¹; ¹Drexel University

9:20 AM Invited

The Mechanics of Reinforcement of Nanocomposites by 2D Materials: *Dimitrios Papageorgiou*¹; Ian Kinloch¹; Robert Young¹; ¹University of Manchester

9:40 AM Invited

Collective Motion of Dislocation Associated with Local Plasticity Initiation and Subsequent Behavior in bcc Metals: *Takahito Ohmura*¹; ¹National Institute for Materials Science

10:00 AM Break

10:20 AM

Investigating the Effect of Severe Surface Plastic Deformation on Sensitization and the Tensile Behavior of AA5083: *Denise Yin*¹; Heather Murdoch¹; B. Hornbuckle¹; Joseph Labukas¹; ¹U.S. Army Research Laboratory

10:40 AM

Nanoscale Structure-Property Relationships of Polyacrylonitrile/CNT Composites as a Function of Polymer Crystallinity and CNT Diameter: Jacob Gissinger¹; Chandrani Pramanik¹; Bradley Newcomb²; Satish Kumar²; *Hendrik Heinz*¹; ¹University of Colorado Boulder; ²Georgia Institute of Technology

11:00 AM

Isolating Solute Effects in Grain Boundary Strengthening Using Nanoindentation: *Prasad Pramod Soman*¹; Erik Herbert¹; Katerina Aifantis²; Stephen Hackney¹; ¹Michigan Technological University; ²University of Florida



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**Ultra High Performance Metallic Systems for
Aerospace, Defense, and Automotive Applications —
High Temperature and other High Performance Alloys**

Program Organizers: Ali Yousefiani, Boeing Research And Technology;
Troy Topping, California State University, Sacramento; Robert Dillon, Jet
Propulsion Laboratory; Linruo Zhao, NRC Aerospace

Thursday AM Room: B235
October 18, 2018 Location: Greater Columbus Convention
Center

Session Chair: Linruo Zhao, National Research Council of Canada

8:00 AM

Quality Assurance of the GTE Cast Blades Protective Coating: Pavel Zhemanyuk¹; Vladimir Klochikhin¹; Valeriy Shilo¹; Aleksey Pedash¹; *Valeriy Naumyk*²; ¹JSC «Motor Sich»; ²Zaporozhye National Technical University

8:20 AM

Processing Scalability and Quaternary Additives for Improved Mo Matrix Mo-Si-B: *Peter Marshall*¹; ¹Imaging Systems Technology

8:40 AM

Cyclic Oxidation Performance of Three Ni-based Superalloys at 900°C in Air: *Mallikarjuna Heggadadevanapura Thammaiah*¹; William Caley¹; Norman Richards¹; ¹University of Manitoba

9:00 AM

Heat Treatable Cr-based Alloys and the Improvement of their Oxidation Resistance by Alloying: *Anke Ulrich*¹; Petra Pfizenmaier²; Ali Soleimani-Dorcheh¹; Uwe Glatzel²; Mathias Galetz¹; ¹DECHEMA-Forschungsinstitut; ²University Bayreuth

9:20 AM

Ultra-conductive Alloys for Low-volume, Low-weight Applications: *Keerti Kappagantula*¹; Frank Kraft¹; ¹Ohio University

9:40 AM

Hot Cracking Phenomena in Light-weight Armor Steel: *William Evans*¹; Katherine Sebeck²; ¹The Ohio State University; ²TARDEQ

POSTER SESSION WITH PRESENTERS

The poster session is divided into 3 separate presentation times (P1, P2, and P3) and grouped by topic area.

Poster presenters only need to stand by their posters during their designated presentation time.

All poster sessions will be held on Tuesday, October 16.

Poster Session I (P1) - 11:00 a.m. – 12:00 pm.

- Additive Manufacturing
- Ceramic and Glass Materials
- Failure Analysis
- Iron and Steel (Ferrous Alloys)
- Materials-Environment Interactions
- Nanomaterials

Poster Session II (P2) - 12:00 p.m. – 1:00 p.m.

- Biomaterials
- Electronic and Magnetic Materials
- Energy
- Fundamentals, Characterization, and Computational Modeling

Poster Session III (P3) - 4:45 p.m. – 5:45 p.m.

- Processing and Manufacturing
- Late News Poster Session

Organizers:

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POSTERS

Additive Manufacturing of Composites and Complex Materials III — Poster Session

Program Organizers: Dirk Lehmkus, Fraunhofer - Ifam; Jonathan Spowart, Air Force Research Laboratory; Nikhil Gupta, New York University; Eric Jaegle, Max-Planck-Institut Fuer Eisenforschung

Tuesday AM
October 16, 2018
Room: Hall A
Location: Greater Columbus Convention Center

11:00 AM - 12:00 PM

P1-1: 3D Printed, Carbon Fiber Reinforced Functionally Graded Lattices for Energy Absorption: *Jason Walker*¹; *Emili Bonanno*¹; *Trevor Leonard*¹; *Mckenzie Scheckelhoff*¹; *Efrain Velez*¹; *Brett Conner*¹; ¹Youngstown State University

P1-2: Additive Manufacturing of Clay Modified with Electric Arc Furnace Steel Dust (EAF Dust): *Edisson Ordoñez*¹; *Henry Colorado*¹; ¹Universidad de Antioquia

P1-3: Additive Manufacturing of Waste Tire Powders Based Composite Materials: *Carlos Revelo*¹; *Mauricio Correa*¹; *Henry Colorado*¹; ¹Universidad De Antioquia

P1-4: Evaluation of Multiple Additive Manufacturing Approaches to Design and Fabricate Functionally Graded Materials: *Timothy Daugherty*¹; *Brian Vuksanovich*¹; *Jason Walker*¹; *Pedro Cortes*¹; *Brett Conner*¹; ¹Youngstown State University

Additive Manufacturing of Metals: Microstructure and Material Properties — Poster Session

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

Tuesday AM
October 16, 2018
Room: Hall A
Location: Greater Columbus Convention Center

11:00 AM - 12:00 PM

P1-5: Effect of the Powder Fusion Vector on the Properties of Samples, Manufactured by Additive Technology: *Pavel Zhemanyuk*¹; *Vladimir Klochikhin*¹; *Nicolay Rud*¹; *Valeriy Naumyk*²; ¹JSC «Motor Sich»; ²Zaporozhye National Technical University

P1-6: Fatigue Life Study of Additively Manufactured IN718 under Varied Process Parameters: *Mahemaa Rajasekaran*¹; *Christopher Kantzos*¹; *Anthony Rollet*¹; ¹Carnegie Mellon University

P1-7: Microstructure and Mechanical Properties of Al-Si-Fe-Cu-Zn Alloys with Mn and Ca Addition: *Yong-Ho Kim*¹; *Hyo-Sang Yoo*¹; *Hyeon-Taek Son*¹; ¹Korea Inst Of Industrial Tech

P1-8: Microstructure and Mechanical Properties of Binder Jet 3D Printed Co-Cr-Mo Biomedical Alloy: *Pierangeli Rodriguez*¹; *Amir Mostafaei*¹; *Markus Chmielus*¹; ¹Univ of Pittsburgh

P1-9: Residual Stress Mapping of As-built and HIP GRCop-84 Fabricated by SLM: *Robert Minneci*¹; *Jeff Bunn*²; *Zachary Jones*³; *Terri Tramel*³; *Claudia Rawn*¹; ¹The University of Tennessee; ²Oak Ridge National Laboratory; ³NASA Marshall

Space Flight Center

P1-10: Study Effects of Cyclic Thermal Gradients on Ti-6Al-4V by In-situ TEM Heating Experiment upon Additive Manufacturing Growth Conditions: *Meiyue Shao*¹; *Cheng-Han Li*¹; *Curtis Frederick*²; *Sudarsanam Babu*²; *Joerg Jinschek*¹; ¹The Ohio State University; ²The University of Tennessee

P1-11: The Investigation of Defects in Additive Manufactured Nickel Superalloy and Optimized Processing Parameter: *Cong Liu*¹; *Iain Todd*¹; ¹University of Sheffield

Additive Manufacturing of Metals: Post Processing — Poster Session

Program Organizers: Ola Harrysson, North Carolina State University; Andrzej Wojcieszynski, ATI Specialty Materials; Ulf Ackelid, Freemelt AB; S. Babu, Indian Institute of Technology Madras

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P1-12: Effect of HIP on Laser Powder Bed Fused & Electron Beam Melted Parts: *Jason Walker*¹; *William Bevan*¹; *Michael Juhasz*¹; *Brett Conner*¹; *Anna Rashid*¹; ¹Youngstown State University

P1-13: Influence of Post Processing upon the Mechanical Properties of Additively Manufactured Titanium Alloy Octet Lattice Structures: *Andrew Neils*¹; *Abbas Moftakhar*²; *Liang Dong*¹; *Haydn Wadley*¹; ¹University of Virginia Department of Materials Science; ²General Electric

Additive Manufacturing: In-situ Process Monitoring and Control — Poster Session

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

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P1-14: A Flash Thermography Technique for In-situ Inspection for the Laser Powder Bed Fusion Process: *Bin Zhang*¹; *Letchuman Sriparagash*²; *Zachary Reese*¹; *Angela Allen*¹; *Christopher Evans*¹; ¹University of North Carolina at Charlotte; ²Siemens Corporate Technology

Additive Manufacturing: Modeling and Simulation of AM Materials, Processes, and Mechanics — Poster Session

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

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Session Chairs: Jing Zhang, Indiana University - Purdue University Indianapolis; Jing Zhang, Indiana University - Purdue University Indianapolis

P1-15: Microstructure Evolution during Cold Spray by Molecular Dynamics Simulation: *Bowen Deng*¹; David Hobbs¹; ¹Montana Tech of the University of Montana

P1-16: Using Computer Vision for Microstructure Analysis: *Bo Lei*¹; Elizabeth Holm¹; ¹Carnegie Mellon University

Advanced Coatings for Wear and Corrosion Protection — Poster Session

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

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

P1-54: Microstructure and Densification of Al-Cr-Si Alloy Target Prepared by Using Gas-atomization and Spark Plasma Sintering: *Hyeon-Taek Son*¹; Yong-Ho Kim¹; Hyo-Sang Yoo¹; ¹Korea Institute of Industrial Technology

Advanced Steel Metallurgy: Products and Processing — Poster Session

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

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P1-38: Computational Prediction of Hot Cracking during Welding of HSLA Steels: *Maddie McAllister*¹; Badri Narayanan²; Michael Kottman²; Eric Gulliver²; ¹Case Western Reserve University; ²Lincoln Electric

P1-40: Effects of Pre-dispersed and Surface-modified AlTi-MgO Nanoparticles on Inclusion Characteristics in Carbon Structural Steel: *Hao Guo*¹; Shufeng Yang¹; Jingshe Li¹; Jikang Li¹; Tiantian Wang¹; Hongbo Zheng¹; ¹University of Science and Technology Beijing

P1-41: Evolution Behaviors and Mechanisms of Internal Crack Healing in Steels at Elevated Temperatures: *Ruishan Xin*¹; ¹HBIS Group Technology Research Institute

P1-42: Research on Improving Slab Internal Quality under Heavy Reduction Technology: Guangyun Wei¹; Jianxin Li¹; Jinbao Chang¹; Shuangjiang Li¹; Li Sun¹; ¹HBIS GROUP

P1-43: Steel Inclusion Classification Using Computer Vision and Machine Learning: *Nan Gao*¹; Elizabeth A. Holm¹; ¹Carnegie Mellon University

Ceramic and Crystal Materials for Optics and Photonics — Poster Session

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Michael Squillante, RMD, Inc; Akio Ikesue, World-Lab. Co., Ltd; Mark Dubinskiy, Amy Research Laboratory

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P1-17: Densification and Grain Growth of Y2O3-MgO Nanocomposite during Two-step Sintering: *Doo Hyun Choi*¹; Seok-Min Yong¹; Seok-Young Ko¹; Kisu Lee¹; Dong-Ik Cheong¹; ¹Agency for Defense Development

P1-18: Fabrication of Nano-grained MgAl2O4 Spinel Using Sinter-HIP Process: *Seok-Young Ko*¹; Kisu Lee¹; Doo Hyun Choi¹; Seok-Min Yong¹; Dong-Ik Cheong¹; ¹Agency for Defense Development

Ceramics and Glasses Simulations and Informatics — Poster Session

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas at Arlington; Efrain Hernandez-Rivera, U.S. Army Research Laboratory

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P1-19: First-principles Study of the Tribology of Glass in Different Environments: *Jordan Barr*¹; Susan Sinnott¹; ¹Penn State University



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Characterization & Methods in Failure Analysis — Poster Session

Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

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Session Chair: Andrew Havics, pH2, LLC

P1-33: Strain Analysis of Geometric Stress Concentrations in Nanostructured CuAg Composite: *Rongmei Niu*¹; Ke Han¹; ¹National High Magnetic Field Lab.

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — Poster Session

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

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P1-65: Biomineralized ZnS Nanoparticle Dissolution: An in-Situ Electron Microscopy Study: *Eric Pierce*¹; Jeremy Eskelsen¹; Jie Xu²; Ji Won Moon¹; David Graham¹; Michelle Chiu¹; Baohua Gu¹; ¹Oak Ridge National Laboratory; ²University of Texas-El Paso

P1-66: Engineering Nano-structure of Perovskite Ceramics: *Habibollah Aminrastabi*¹; DongLiang Peng¹; Gouli Ji¹; Hao Xue¹; ¹Xiamen University

P1-68: Liquid Phase Epitaxial Growth of Nickel Zinc Ferrite Films and Studies on Converse Magneto-electric Effects in a Composite with PZT: *Peng Zhou*¹; Tianjin Zhang²; Gopalan Srinivasan¹; ¹Oakland Univefsity; ²Hubei University

P1-69: Load Dependent Hardness of Nanocrystalline and Microcrystalline Ceramics: *James Wollmershauser*¹; Heonjune Ryou²; Boris Feigelson¹; Edward Gorzkowski¹; Kathryn Wahl¹; ¹U.S. Naval Research Laboratory; ²American Society for Engineering Education Postdoctoral Research Fellow sited at U.S. Naval Research Laboratory

Eco-Friendly and Sustainable Ceramics — Poster Session

Program Organizers: Enrico Bernardo, University of Padova; Henry Colorado, Universidad De Antioquia; Ivo Dlouhy, Institute of Physics of Materials, Academy of Sciences of the Czech Republic; Aldo Boccaccini, University of Erlangen-Nuremberg; Antonio Pedro Oliveira, Federal University of Santa Catarina; Isabella Lancellotti, Università di Modena e Reggio Emilia; Alexander Karamanov, Bulgarian Academy of Sciences Institute of Physical Chemistry “Rostislaw Kaischew”; Vilma Ducman, Slovenian National Building and Civil Engineering Institute

Tuesday AM Room: Hall A
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P1-20: A Novel Lightweight Low-temperature Stoneware Tile: Cristina Siligardi¹; *Magdalena Lassinanti Gualtieri*¹; Denia Mazzini²; ¹University of Modena and Reggio Emilia, Department of Engineering “Enzo Ferrari”; ²Colorobbia Italia S.P.A.

P1-21: Eco-friendly and Sustainable Lightweight Aggregates for Building and Agronomic Purpose: Luisa Barbieri¹; Fernanda Andreola¹; Alessandro Borghi¹; Anna Maria Ferrari¹; *Isabella Lancellotti*¹; ¹UNIMORE

P1-22: Evaluation of the Durability in Hydraulic Concrete, a Waste from the Aggregates Trituration, and Additives to Reduce the Reactivity Alkali-aggregate: *Guilliana Agudelo-Buitrago*¹; Henry Colorado¹; ¹Universidad De Antioquia

P1-23: Obtainment of Lightweight Ceramic Materials by Biochar Addition: Giulio Allesina¹; Fernanda Andreola¹; Luisa Barbieri¹; *Isabella Lancellotti*¹; Simone Pedrazzi¹; Paolo Tartarini¹; Vittorio Vezzali¹; ¹University of Modena and Reggio Emilia

Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology — Poster Session

Program Organizers: John Kieffer, University of Michigan; Liping Huang, Rensselaer Polytechnic Institute

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P1-25: Role of Iron in Sodium Aluminosilicates and Sodium Silicates: *Mostafa Ahmadzadeh*¹; John McCloy¹; ¹Washington State University

Innovative Processing and Synthesis of Ceramics, Glasses and Composites — Poster Session

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

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P1-26: Fabrication of Thick Films of Alumina Nanoparticles Using Electrophoretic Deposition: *Prabal Tiwari*¹; Jennifer Andrew¹; ¹University of Florida

International Symposium on Ceramic Matrix Composites — Poster Session

Program Organizers: Jitendra Singh, Retired, U.S. Army Research Laboratory; Narottam Bansal, National Aeronautics and Space Administration; Jacques Lamon, CNRS; Sung Choi, Naval Air Systems Command

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Session Chair: Jitendra Singh, Retired, U.S. Army Research Laboratory

P1-27: Preventive Erosion Coating on Metal Tube Using for Industrial Biomass Boiler: Noppakun Sanpo¹; ¹SCG Chemicals Co., Ltd.**Manufacturing-Related Failures — Poster Session**

Program Organizers: Andrew Havics, pH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

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Session Chair: Andrew Havics, pH2, LLC

P1-34: Effect of Strain Rate on the Rolling of Nickel Based Alloy: Chien-Lin Lai¹; Ming-Yen Li¹; Shih-Ming Kuo¹; Yeong-Tsuen Pan¹; ¹China Steel Corporation

P1-35: Evaluation of the Relationship between Surface Roughness and Stress Concentration Factor in Fatigue Failure of Ti6Al4V EBM Parts: Oluwatobi Kalejaiye¹; Cynthia Waters¹; Christopher Evans²; Boyce Collins¹; Oluwaseun Adewumi¹; Manisha Banker¹; ¹North Carolina A&T State University; ²UNCC

P1-36: The Influence of Microporosity on the Mechanical Properties of K4169 Alloy with/without HIP Treatment: Maodong Kang¹; Yun Wu¹; Yahui Liu¹; Junwei Yu¹; Jun Wang¹; Haiyan Gao¹; ¹Shanghai Jiao Tong University

Microalloyed Steels — Poster Session

Program Organizers: Emmanuel De Moor, Colorado School of Mines; Steven Jansto, CBMM-North America Inc; Robert Glodowski, RJG Metallurgical LLC

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P1-48: Detection of Inclusions in Steel by Electrochemical Corrosion Methods: Xuwei Zhang¹; ¹Central Iron and Steel Research Institute

P1-51: Influence of Carbide Precipitation on Stability of Grain-refined Reversed Structures in a 321 Austenitic Stainless Steel under Tensile Loading: Yanming He¹; Tiansheng Wang¹; ¹Yanshan University

Phase Transformations in Ceramics: Science and Applications — Poster Session

Program Organizers: Waltraud Kriven, University of Illinois at Urbana-Champaign; Pankaj Sarin, Oklahoma State University; Yu Zhong, Worcester Polytechnic Institute

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P1-28: Effect of A-site Aliovalent Doping on the Thermo-physical Properties of RENbO₄ Materials: Dan Lowry¹; Leah McMillan¹; Pankaj Sarin¹; ¹Oklahoma State University

P1-29: Influence of W and Mo Substitution on Phase Stability and Transformation Properties of CeNbO₄: Dan Lowry¹; Tony Thomas²; Edward Sabolsky²; Pankaj Sarin¹; ¹Oklahoma State University; ²West Virginia University

P1-30: In-situ High Temperature X-ray Diffraction up to 1500°C in Air: Lab Source XRD and Quadropole Lamp Furnace: Dan Lowry¹; Gregory Dillard¹; Pankaj Sarin¹; ¹Oklahoma State University

P1-31: Role of Thermodynamic Miscibility Gap in Phase Selection in Sol-gel Synthesis of (Y, Yb) Silicates: Surendra Anantharaman¹; Raghunandan S¹; Hari Kumar K.C¹; Suresh Kumar R²; Kamaraj M¹; Ashutosh Gandhi³; ¹Indian Institute of Technology Madras; ²Liquid Propulsion Systems Centre, Indian Space Research Organization; ³Indian Institute of Technology Bombay

Selection of Materials for Application in Corrosive Environments — Poster Session

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

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P1-55: A Superhydrophobic Composite Coating and Its Corrosion Resistance: Jiahua Wang¹; Dajiang Zheng¹; Guang-Ling Song²; ¹Xiamen University; ²General Motors

P1-56: Corrosion Inhibition Effect by Dimethylethanolamine on Concrete Steel-reinforcement in Aggressive Environments: Joshua Okeniyi¹; Elizabeth Okeniyi²; ¹Covenant University; ²Covenant University, Ota, Nigeria

P1-57: Influence of Microstructure on Electrochemical Corrosion Behavior of a Pure Al Coating: Yanyan Zhang¹; Dajiang Zheng¹; Guang-Ling Song²; ¹Xiamen University

P1-58: Investigating Anticorrosion Performance of Syzygium Samarangense Leaf-extract on Steel-reinforcement in Concrete: Joshua Okeniyi¹; Elizabeth Okeniyi¹; ¹Covenant University

P1-59: Microstructural Evolution and Corrosion Assessment in Saline Water of 2xx.0 Aluminum Alloys Developed by Squeeze Casting Technique: Yogendra Mahton¹; Meeta Kamde¹; Partha Saha²; ¹NIT Rourkela; ²National Institute of Technology Rourkela



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P1-62: Study of Inhibitive Performance of Eco-friendly Material on Stainless Steel in Simulated Saline Environment: *Omotayo Sanni*¹; API Popoola¹; ¹Tshwane University of Technology

P1-63: The Characteristic Change of Oxygen Free Copper Based Welding Material in High Temperature Environment Containing a Large Amount of Hydrogen: *Doryun Lee*¹; Gyootaek Lee¹; Kanghyouk Choi¹; Changho Moon¹; ¹POSCO

User-related Failures — Poster Session

Program Organizers: Andrew Havics, PH2 LLC; Burak Akyuz, ATS, Inc.; Pierre Dupont, UMONS Faculté polytechnique de MONS (FPMs)

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Session Chair: Andrew Havics, pH2, LLC

P1-37: Analysis on Effect of Expensive Soil Using Polimeric Stabilizing Agents: *Xijin Zhang*¹; Xiong Yu¹; Yuan Guo¹; Xudong Fan¹; ¹Case Western Reserve University

10th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Poster Session

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

Tuesday PM
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P3-1: Investigation of Carbon Fiber Reinforced Silica Sol Shell for Investment Casting: *Rui Guo*¹; ¹Hubei University of Automotive Technology

Advanced Manufacturing, Processing, Characterization, and Modeling of Functional Materials — Poster Session

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

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P3-2: Mathematical Modelling of Residual Stresses in End Milling: *Sunday Ojolo*¹; Adebayo Ogundare¹; ¹University of Lagos

P3-3: Novel Material Properties from High Turbulence Coaxial Jet Mixing-modeling and Characterization: *David Spang*¹; ¹Rowan College at Burlington County

P3-4: Numerical Simulation of Physical Field in a Continuous Hot-dip Galvanizing Bath: *Jianfeng He*¹; ¹Baosteel

P3-5: Polymer-derived Porous Carbon Spheres Modified Superhydrophobic Melamine Formaldehyde Sponge (PCS@MF) for Oil Spill Remediation: Love Dashairya¹; *Partha Saha*¹; ¹NIT Rourkela

P3-6: Tensile Strength Evaluation of Aluminium Alloy 6063 Hybrid Metal Matrix Composite by Using Stir Casting Method: *Balwinder Singh*¹; ¹GZS Campus CET Bathinda

P3-7: Thermo-mechanical Coupled Analysis of Hot Press Forming with 22MnB5 Steel: *Jonghun Yoon*¹; ¹Hanyang University ERICA

Advances in Dielectric Materials and Electronic Devices — Poster Session

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

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Session Chair: José de Los Santos Guerra, Universidade Federal de Uberlândia

P2-8: Anelastic Behavior in GaN LED under Forward and Reverse Bias: *Chun-Kail Huang*¹; ¹National Central University

P2-9: Capacitor: Constant Voltage/Current Sources: Steven Tidrow¹; *Jessica Scoones*¹; Dustin Travis¹; Soutik Beta¹; Walter Schulze¹; Steven Pilgrim¹; ¹Alfred University

P2-10: CoFe₂O₄-BaTiO₃ Core-shell Nanocomposites: Synthesis, Structural, Microstructural and Ferroic Properties: *Luiz Fernando Cotica*¹; Denise Alanis¹; Raquel Bini¹; Gustavo Dias¹; Ivair Santos¹; Ruyan Guo²; Amar Bhalla²; ¹State University Of Maringa; ²University of Texas at San Antonio

P2-11: Electronic Properties of Rare-earth-modified Barium Titanate Ferroelectrics by DFT: *Abraham Pablo Aslla Quispe*¹; Roberto Hiroki Miwa¹; Jose de los Santos Guerra¹; ¹Universidade Federal de Uberlandia

P2-12: Fabrication and Characterization of PVDF/Ba<0.85>Ca<0.15>Zr<0.1>Ti<0.9>O<3> (BCZT) Composite Film: Effect of Two Different Method Prepared BCZT Powder: *Ranabrata Mazumder*¹; Pragma Dixit¹; ¹National Institute of Technology Rourkela

P2-13: Integrated Piezoelectric and Thermoelectric Sensing and Energy Conversion: *Bryan Gamboa*¹; *Maximilian Estrada*¹; Albert Djikeng¹; Daniel Nsek¹; Samer Dessouky¹; Amar Bhalla¹; Ruyan Guo¹; ¹University of Texas at San Antonio

P2-15: Shottky Barrier Fractal Nature Correction: *Vojislav Mitic*¹; Goran Lazovic²; Zoran Vosika³; Vesna Paunovic³; Sandra Veljkovic³; Branislav Vlahovic⁴; ¹University of Nis; Institute of Technical Sciences of SASA; ²University of Belgrade; ³University of Nis; ⁴North Carolina Central University

P2-16: Spatial Magnetic Source Detection Based on Magnetolectric Heterostructure with 2D & 3D Configurations: *Junran Xu*¹; Chung Ming Leung¹; Xin Zhuang¹; Jiefang Li¹; Dwight Viehland¹; ¹Virginia Tech

P2-17: Synthesis and Analyses, Structural and Microstructural CoFe₂O₄:BaTiO₃ Core-shell Nanocomposites: Denise Alanis¹; Luiz Cótica²; Ruyan Guo³; Amar Bhalla³; Moumita Dutta³; ¹UTSA/ UEM; ²UEM; ³UTSA

P2-18: Temperature and Pressure Dependent Dielectric Properties of Sugary Carbonated Solutions: Carlos Acosta¹; Amar Bhalla¹; Ruyan Guo²; ¹University of Texas at San Antonio; ² University of Texas at San Antonio

P2-19: Thermal and Structural Properties of Glass-ceramic Based Composites Containing Ferroelectric Nanocrystals: Renato Cruvinel de Oliveira¹; Anielle Almeida Silva²; Noélio Oliveira Dantas²; Jose de los Santos Guerra²; ¹Universidade Estadual Paulista; ²Universidade Federal de Uberlandia

Advances in Solid Oxide Fuel Cell Technology — Poster Session

Program Organizers: Scott Swartz, Nexceris LLC; Matthew Seabaugh, Nexceris LLC; Jeff Stevenson, Pacific Northwest National Laboratory

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P2-23: Comparison of H₂S Poisoning for Proton Conducting SOFC Versus Oxide Ion Conducting SOFC: Shichen Sun¹; Zhe Cheng¹; ¹Florida International Univ

P2-24: High-temperature Redox Stable Anode Materials for SOFC: Tony Thomas¹; He Qi¹; Edward Sabolsky¹; Xingbo Liu¹; John Zondlo¹; Richard Hart²; ¹West Virginia University; ²GE Global Research Centre

P2-25: Sintering and Electrical Conductivity Properties of Calcium Doped La(Ni,Fe,Cr,Co)O₃ for SOFC Cathode Materials: Sai Gajjala¹; Rasit Koc¹; Abhigna Kolisetty²; ¹Southern Illinois University Carbondale; ²AECOM

Advances in Surface Engineering — Poster Session

Program Organizers: Brian Skinn, Faraday Technology, Inc.; Timothy Hall, Faraday Technology, Inc.; Sandip Harimkar, Oklahoma State University; Michael Roach, University of Mississippi Medical Center; Rajeev Gupta, The University of Akron

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Session Chair: Brian Skinn, Faraday Technology, Inc.

P3-8: Scanning Auger Microprobe Signal Optimization: Ji Xia¹; Frank Ernst¹; ¹Case Western Reserve University

P3-9: Surface Free Energy and Moisture Susceptibility Evaluation of Modified and Foamed Asphalt Binders: Jianying Hu¹; Xiong Yu¹; ¹Case Western Reserve University

Boron, Boron Coatings, Boron Compounds and Boron Nanomaterials: Structure, Properties, Processing, and Applications — Poster Session

Program Organizers: Jens Kunstmann, Technische Universität Dresden; Roumiana Petrova, New Jersey Institute of Technology; Scott Beckman, Washington State University

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P3-10: Boronitride Nanosheet Aerogel Phase Change Material Composites: Russell Dent¹; Marjan Kashfipour¹; Jiahua Zhu¹; ¹University of Akron

Composition-Processing-Microstructure-Property Relationships of Titanium Alloys — Poster Session

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

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P3-11: Continuous Severe Plastic Deformation Methods: Asli Günay Bulutsuz¹; Mehmet Emin Yurci¹; ¹Yildiz Technic University

P3-12: Development of Low Cost Titanium-manganese System Shape Memory Alloys: Masahiko Ikeda¹; Masato Ueda¹; ¹Kansai University

P3-13: Modeling Elastic Modulus in the Ti-Al-V Alloy System: Sawyer Gill¹; Joshua Strother¹; Albert Ostlund¹; Chelsey Hargather¹; James Saal²; Ricardo Komai²; ¹New Mexico Institute of Mining & Technology; ²QuesTek Innovations, LLC

IMS Symposium on Metallography and Microstructural Characterization of Materials and the Correlation of Microstructure to Mechanical Properties — Poster Session

Program Organizers: Daniel Dennies, DMS, Inc.; James Martinez, NASA Johnson Space Center; Michael Keeble, Buehler, A Division of ITW; Jaret Frafjord, IMR Test Labs - Portland

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Session Chair: Daniel Dennies, DMS, Inc.

P2-31: Controlled Atmosphere Creep Testing for High Resolution Strain Localization Measurement: Ashton Egan¹; Connor Slone¹; Michael Mills¹; ¹The Ohio State University

P2-32: EBSD and Metallography of Hydroformed /Annealed CRES Liner for Cryo COPVs Used in Human Rated Spacecraft: James Martinez¹; ¹NASA Johnson Space Center



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P2-33: Machine Learning and Physical Simulation to Solve the Missing Boundary Problem: *Thomas Matson*¹; Eric Li¹; Keith Kozlosky¹; Jingxi Cai¹; Elizabeth Holm¹; ¹Carnegie Mellon University

P3-19: TEM-Investigation on Eutectic Phase Formation in Ni-30Cr Filler Metal 52XL: *Cheng-Han Li*¹; Meiyue Shao¹; Carolin Fink¹; John Lippold¹; Joerg Jinschek¹; ¹The Ohio State University

Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches — Poster Session

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

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Location: Greater Columbus Convention Center

P2-35: Controlling Surface Charge and the Photochemical Reactivity on SrTiO₃ Surfaces with the Solution pH: *Mingyi Zhang*¹; Paul Salvador¹; Gregory Rohrer¹; ¹Carnegie Mellon University

P2-36: Modeling the Effects of Bubble Dynamics on Dendrite Growth during Solidification of Binary Alloys: *Seyed Amin Nabavizadeh*¹; Mohsen Eshraghi²; *Sergio Felicelli*¹; ¹University of Akron; ²California State University

P2-37: Understanding the Mechanism of Metal Oxidation on the Nanoscale: Vacancy Transport, Energy Barriers, and Rate Predictions: *Krishan Kanhaiya*¹; Michael Nathanson¹; Hendrik Heinz¹; ¹University of Colorado Boulder

Joining of Advanced and Specialty Materials (JASM XX) — Poster Session

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

Tuesday PM
October 16, 2018
4:45 PM - 5:45 PM
Room: Hall A
Location: Greater Columbus Convention Center

P3-14: Additive Manufacturing for the Fabrication of Pylon in Lower Limb Prosthesis: *Fariborz Tavangarian*¹; ¹Pennsylvania State University, Harrisburg

P3-15: Comparative Analysis of the Mechanical Properties of Aluminum Alloys Welded Joints Obtained by Friction Stir Welding: *Fedor Isupov*¹; Anton Naumov¹; Oleg Panchenko¹; Leonid Zhabrev¹; Anatoly Popovich¹; ¹Peter the Great Saint-Petersburg Polytechnic University

P3-16: Effect of Beam Oscillation on Porosity & Intermetallic Compounds Formation of Electron Beam welded DP600 Steel to Al 5754 Alloy Joints: *Soumitra Dinda*¹; Prakash Srirangam²; Gour Gopal Roy¹; ¹Indian Institute Of Technology Kharagpur; ²University of Warwick

P3-17: Effects of Titanium on Active Bonding between Sn_{3.5}Ag₄Ti(Ce,Ga) Alloy Filler and GaAs Substrate: *Xiaoqiang Wang*¹; Yue Zhi¹; Hongwei Luo¹; Zhigang Cai¹; Lanxian Cheng²; ¹China Electronic Product Reliability and Environmental Testing Research Institute; ²South China Agricultural University

P3-18: Finite Element Simulation of Temperature Field during FSW of Dissimilar Al-Cu Joint: *Evgenii Rylkov*¹; Fedor Isupov¹; Oleg Panchenko¹; Anton Naumov¹; Iurii Golubev¹; ¹Peter the Great St.Petersburg Polytechnic University

Late News Poster Session

Tuesday PM
October 16, 2018
4:45 PM - 5:45 PM
Room: Hall A
Location: Greater Columbus Convention Center

P3-38: 4D and In Situ X-ray Microscopy for Studying Change & Evolution in Materials Across Multiple Length Scales: *William Fadgen*¹; Will Harris¹; Hrishikesh Bale¹; Steve Kelly¹; Benjamin Hornberger¹; ¹Carl Zeiss X-ray Microscopy

P3-39: A Computational Approach for Predicting Mechanical Properties of Plasma Sprayed Ceramic Oxide Coatings: *Sadhana Bhusal*¹; Cheng Zhang¹; Jennifer Bustillos¹; Pranjal Nautiyal¹; Benjamin Boesl¹; Arvind Agarwal¹; ¹Florida International University

P3-40: A Fast Microwave Synthesis Method of TiP₂O₇/Carbon Composites for Aqueous Electrolyte Lithium-ion Batteries: *Haosheng Song*¹; Jiming Wu¹; Wei Wu¹; ¹Carnegie Mellon University

P3-42: Application of Automated Scripting with CALPHAD to Explore the Sensitivity of Chemical Composition in Alternative Titanium Alloys for Additive Manufacturing: *Ryan Jennings*¹; Ben Brown¹; Benjamin Sikora¹; ¹Kansas City National Security Campus

P3-43: Bacterial Pectinase for Improvement of Pineapple Fiber Quality: Pilanee Vaithanomsat¹; Chanaporn Trakooljae¹; Jiraporn Meelaksana¹; *Rungsima Chollakup*¹; Jirachaya Boonyarit¹; Anthika Boondaeng¹; ¹KAPI, Kasetsart University

P3-44: Characterization of Zirconia Produced by Nano Particle Jetting: *John Martin*¹; Brett Conner¹; Pedro Cortes¹; Eric MacDonald¹; ¹Youngstown State University

P3-45: Cluster Formation of Network-Modifier Cations in Cesium Silicate Glasses Studied with ²⁹Si MAF NMR: *Daniel Jardon-Alvarez*¹; Kevin Sanders²; Pyae Phyo³; Jay Baltisberger³; Philip Grandinetti¹; ¹Ohio State University; ²Université de Lyon; ³Berea College

P3-46: Comparison of Ti₂AlC Thick Coatings Deposited by Plasma Spray and Kerosene-fuelled High Velocity Oxy-fuel (HVOF) Spray: *Zheng Zhang*¹; Jisheng Pan¹; Doreen Mei Ying Lai¹; Suo Hon Lim¹; ¹Institute of Materials Research and Engineering

P3-48: Constraints of NiO-GDC/GDC/LSCF-GDC Manufactured by Tape Casting and Reactive Magnetron Sputtering Processes of Solid Oxide Fuel Cells: *carlos ignacio londoño*¹; ¹Femto-ST

P3-49: Corrosion Mechanism of Spinel-Periclase-Zirconia (MgAl₂O₄-MgO-ZrO₂) Refractories for RH Degasser: *Somnath Mandal*¹; C. J. Dileep Kumar²; Devendra Kumar¹; ¹Indian Institute of Technology (Banaras Hindu University); ²TRL Krosaki Refractories Limited

P3-50: Cracking in Forged 1½" dia SA 182 F304L Integrally Reinforced Nozzles from a Fourth Stage Suction Separator for a CO₂ Compressor: *Riza Khan*¹; Allan Ramkhelawan¹; ¹In-Corr-Tech Ltd

P3-51: Development of High Strength Hot-rolled Steel Products for Automotive Applications: *Esther Hutten*¹; Hatem Zurob¹; Sujay Sarkar²; Erika Bellhouse³; Yaping Lu³; ¹McMaster University; ²ArcelorMittal Global R&D Maizieres; ³ArcelorMittal Global R&D Hamilton

POSTERS

P3-52: Development of Manufacturing Process for 'Ni-42Cr-0.1N' Fuel Clad Tube Alloy: *Ashmita Patra*¹; Narahari Prasad¹; Sivasubramanian Krishnan¹; ¹Mishra Dhatu Nigam LTD

P3-53: Development of Pore Network in Binder-jetted Reactive Materials: *Kartik Ganjoo*¹; Pragnya Kunchala¹; Keerti Kappagantula¹; ¹Ohio University

P3-54: Development of Rhenium Free Heat-resistant Nickel Alloy for the Cast Blades Production by the Method of Directional Crystallization: Evgeniy Milonin¹; Pavel Malinovsky¹; *Valeriy Naumyk*²; Sergey Gayduk²; ¹JSC «Motor Sich»; ²Zaporozhye National Technical University

P3-55: Diffusion Studies for Ceramic-to-Metal Joining for Heat Exchanger Applications: *Yaiza Rodriguez*¹; Allyssa Bateman¹; Luke Schoensee¹; Timothy Phero¹; Brian Jaques¹; ¹Boise State University

P3-56: Effect of Additive Defect Density on High Temperature Electrical Performance of Ultra-Conductive Copper Alloys: Keerti Kappagantula¹; *Jacob Smith*¹; ¹Ohio University

P3-57: Effect of CaO/SiO₂ and Al₂O₃/SiO₂ on the Oxygen Activity in S32205 Duplex Stainless Steel Melts: *Jianchao Zheng*¹; Xiaojun Hu¹; Shaopeng Fu²; Ping Lin²; Kuochih Chou¹; ¹University of Science and Technology Beijing; ²Ruipu Technology Group Co., Ltd.

P3-59: Effect of Pyrolysis Temperature on Biomass Chars CO₂ Gasification Reactivity: Wei Tong¹; Qingcai Liu¹; Chen Yang¹; *Tianshi Zhang*¹; Shan Ren¹; ¹Chongqing University

P3-62: Effects of Manufacturing Parameters on Electrical and Mechanical Performance of Ultra-conductive Aluminum Alloys: *Aditya Nittala*¹; Keerti Kappagantula¹; ¹Ohio University

P3-63: Effects of Ti Particles Addition on the Mechanical Properties of Magnesium Alloy AZ31: *Baleegh Alobaid*¹; ¹University of Kentucky

P3-64: Electrical and Mechanical Performance of 3D Printed Hybrid Polymer Composites: *Yahya Al Majali*¹; Keerti Kappagantula¹; ¹Ohio University

P3-65: Electrochemical Behavior and Microstructural Study of Traditionally and Additive Manufactured Ti6Al4V: *Hafiz Muhammad Hamza*¹; M.J.K. Lodhi¹; Waseem Haider¹; ¹Central Michigan University

P3-66: Electrostatic Levitation for Studies of Additive Manufacturing Materials for Extreme Environments: Michael SanSoucie¹; Jan Rogers¹; *Robert Hyers*²; ¹NASA MSFC; ²University of Massachusetts

P3-67: Embedded Sensors within Ceramic Refractory for High-temperature Process and Health Monitoring: Kathy Sabolsky¹; *Gunes Yakaboylu*¹; Kavin Sivaneri¹; Benjamin Buzzo¹; *Edward Sabolsky*¹; Jeffrey Bogan²; Margaret Raughley²; ¹West Virginia University; ²HarbisonWalker International Technology Center

P3-68: Engineering Mechanical, Biodegradable, and Sorption Behaviours of a Bioelastomer by Clay: *Sungkwon Yoon*¹; Biqiong Chen¹; ¹Queen's University Belfast

P3-70: Experimental Benchmarks for Mechanical Properties of Highly-loaded Carbon Nanotube-reinforced Polyether Ether Ketone: *Margie Guerrero Fernandez*¹; Carlos Marin¹; ¹University of Puerto Rico at Mayaguez

P3-71: Experimental Considerations for Producing Reliable High-pressure Adsorption Isotherms Using the Volumetric Method: *Christopher Sims*¹; Huong Giang Nguyen¹; Jarod Horn¹; Laura Espinal¹; ¹National Institute of Standards and Technology

P3-72: Extrusion Based 3D Printing of Metallic Scaffolds Using Particle Based Liquid Inks: *Kameswara Pavan Ajjarapu*¹; Safa Khodabakhsh¹; ¹University of Cincinnati

P3-73: Fabrication of Co-Cr-Mo Fiber from the Melt by Unidirectional Solidification: *Yuui Yokota*¹; Takayuki Nihei²; Masao Yoshio¹; Akihiro Yamaji¹; Yuji Ohashi¹; Shunsuke Kurosawa¹; Kei Kamada¹; Akira Yoshikawa¹; ¹Tohoku University; ²C&A Corporation

P3-74: Fabrication of Cytocompatible Porous Poly(Lactic Acid) Scaffold by Porogen Leaching Method for Bone Tissue Engineering: *Rungsima Chollakup*¹; Pimchanok Pimton²; Pimpon Uttayarat³; Tatsanee Phermthai⁴; ¹KAPI, Kasetsart University; ²Walailak University; ³Thailand Institute of Nuclear Technology; ⁴Faculty of Medicine Siriraj Hospital, Mahidol University

P3-75: Fabrication of Porous Metals via Selective Phase Dissolution of an Al-Cu Alloy: *Juan Vargas Martinez*¹; Oscar Suárez¹; ¹University of Puerto Rico Mayaguez

P3-76: Facile Synthesis of Citric Acid Derived Carbon Nanodots and Their Application As Exogenous Hydrogen Peroxide Sensor: *Olayemi Fakayode*¹; ¹University of Johannesburg

P3-77: Four Decades of CALPHAD: Statistical Trends in Published Thermodynamic Models: *Richard Otis*¹; Axel Van de Walle²; ¹Jet Propulsion Laboratory; ²Brown University

P3-78: Freeze-casting and Freeze-drying Solid Oxide Fuel Cells: *Yanhai Du*¹; Nader Hedayat¹; Dhruva Panthi¹; Hoda Ilkhani¹; Benjamin Emley²; Theo Woodson¹; ¹Kent State University; ²University of Houston

P3-79: Friction Stir Welding of Precipitation Strengthened Aluminum to Solid Solution Strengthened Aluminum for Military Applications: *Martin McDonnell*¹; Nelson Martinez²; Demetrios Tzelepis¹; ¹US Army-TARDEC; ²Concurrent Technologies Corporation

P3-80: Grain Boundary Segregation and Precipitate Behavior in Inconel 718 Superalloys: *Matt Pietrucha*¹; Katherine Rice¹; Robert Ulfig¹; David Larson¹; Yimeng Chen¹; ¹Cameca Instruments

P3-81: Growth Rate Dependence of Microstructure and Mechanical Properties on Co-Cr-Mo Fibers Fabricated by Unidirectional Solidification: *Shoki Abe*¹; Yuui Yokota²; Takayuki Nihei³; Masao Yoshino¹; Akihiro Yamaji¹; Yuji Ohashi²; Shunsuke Kurosawa⁴; Kei Kamada⁵; Akira Yoshikawa⁶; ¹IMR, Tohoku University; ²NICHE, Tohoku University; ³C&A; ⁴NICHE, Tohoku University, Yamagata University; ⁵NICHE, Tohoku University, C&A; ⁶IMR, Tohoku University, NICHE, Tohoku University, C&A

P3-82: High-yield Synthesis of Nanostructured Boron Phosphide via a Pyrotechnic Pathway: *Zhaohua Luan*¹; Lauren Morris¹; Anthony Shaw¹; Christopher Haines¹; Jay Poret¹; ¹ARDEC


P3-83: Hydrogen Behaviour in a Duplex Stainless Steel: *Zoha Ghorani*¹; Afshin Yousefi¹; ¹Ibaraki University

P3-84: Improving Hardness and Corrosion Resistance of Aluminum Alloys by Mechanical Alloying and V Additions: *Javier Esquivel*¹; Rajeev Gupta¹; ¹The University of Akron

P3-85: In-situ Neutron Diffraction to Study the Solidification of Al-Si Alloys: *Eli Vandersluijs*¹; Comondore Ravindran¹; Dimitry Sediako²; Abdallah Elsayed³; Glenn Byczynski⁴; ¹Ryerson University; ²University of British Columbia; ³University of Guelph; ⁴Nemac Canada Corporation

P3-86: Induced Porosity via Powder Bed Fusion: *Scott Roberts*¹; Ben Furst¹; Stefano Cappucci¹; Timothy O'Donnell¹; Eric Sunada¹; ¹NASA/Jet Propulsion Laboratory

P3-87: Integrating Boron Nitride Nanotubes in Aluminum for Superior Mechanical Properties: *Pranjal Nautiyal*¹; Benjamin Boesl¹; Arvind Agarwal¹; ¹Florida International University



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POSTERS

P3-88: Investigation of KNN-based Materials for Multifunctional Energy Harvesting Applications: *Guoyang Ye*¹; ¹Engineering North Campus

P3-90: Mandibular Plates Prototypes for Maxillofacial Surgery by Additive Manufacturing: Design Evaluation and Accuracy: *Ilaria Campioni*¹; Ilaria Cacciotti¹; Nikhil Gupta²; ¹Niccolò Cusano University; ²New York University Tandon School of Engineering

P3-91: Mechanical Properties of Al-SiO₂ Metal Ceramic Composite 3D Printed via Stereolithography: *Bhargavi Mummareddy*¹; Michael Maravola¹; Eric MacDonald¹; Jason Walker¹; Brian Hetzel¹; Brett Conner¹; Pedro Cortes¹; ¹Youngstown State University

P3-92: Mechanism of Etching of Al-4.5Mg-1.0Mn Alloy: Aline D. Gabbardo¹; *Xi Wang*¹; Angeire Huggins¹; Gerald Frankel¹; ¹Ohio State University

P3-93: Melt-pool Scale Surface Topography for Single Tracks of Alloy 718 and TiAl Powders Deposited by Powder Bed Fusion (PBF) Technique: *Seul Bi Lee*¹; Jae Woong Kim¹; Jae Keun Hong²; Yoon Suk Choi¹; ¹Pusan National University; ²Korean Institute of Materials Science

P3-94: Microstructural and Doping Effects on Thermoelectric Properties of Si/β-FeSi₂ Composite: *Rajasekar Parasuraman*¹; Arun Umarji¹; ¹Indian Institute of Science

P3-95: Microstructural Evolution of Ion-irradiated ZrC: *Raul Florez*¹; ¹Missouri University of Science & Technology

P3-96: Microstructures and Mechanical Properties of Carbon-containing FeCuCrNi High Entropy Alloys Prepared by Selective Laser Melting: *Yong Liu*¹; Rui Zhou¹; Kechao Zhou¹; Ping Zhou¹; Min Song¹; ¹Central South University

P3-98: Modeling Single Tracks of Alloy 718 and TiAl Powders Deposited by Powder Bed Fusion (PBF) Technique: *Jae Woong Kim*¹; Seul Bi Lee¹; Jae Keun Hong²; Yoon Suk Choi¹; ¹Pusan National University; ²Korean Institute of Materials Science

P3-99: Modeling the Sensitization of 5XXX Series Aluminum Alloys: Matthew Steiner¹; *Likun Sun*¹; ¹University of Cincinnati

P3-100: Multiplex Viral Detection Platform Using Aptasensor: *Nileshi Saraf*¹; Michael Villegas¹; Sudipta Seal¹; ¹University of Central Florida

P3-101: Phase Separation in Silicate Glasses Revealed Through Inverse Laplace Analysis of ²⁹Si T₂ Relaxation: *Mark Bovee*¹; ¹Ohio State University

P3-102: Potential Barrier at the Grain Boundary of LaGaO₃-based Solid Solution Deduced from a Linear Diffusion Model: *Chih-Yuan Chang*¹; Igor Lubomirsky²; Sangtae Kim¹; ¹University of California, Davis; ²Weizmann Institute of Science

P3-103: Potential of the Al₂-xGa_xW₃O₁₂ System for High Thermal Shock Resistance: *Isabella Costa*¹; Victoria Blair²; Bojan Marinkovic¹; ¹Pontifical Catholic University of Rio de Janeiro; ²US Army Research Laboratory

P3-104: Preliminary Investigations into the Mechanical/Current-Activated Reactive Processing of Nickel-Aluminide-CNT Composites: *Kaitlin Kehl*¹; Mehul Chauhan¹; Prathmesh Modi¹; Khaled Morsi¹; ¹San Diego State University

P3-105: Process-based Cost Modeling of IE-4 Induction Motors for Industrial Applications: *Inchul Choi*¹; ¹Korea Institute of Industrial Technology

P3-107: Pulsed Laser Deposition of VO₂ Thin Films for Optical Applications: *Arun Umarji*¹; Devanshi Bhardwaj¹; S. B. Krupanidhi¹; ¹Indian Institute of Science

P3-108: Reheating Characteristics of Semi-solid AC7A Al alloy Fabricated by Cooling Slope Method.: *Ahruem Beck*¹; Sedong Lee¹; Seoyeong Kim¹; Duckhyun Kim¹; Sugun Lim¹; ¹Gyeongsang National University

P3-112: Simulating Fresnel-mode Lorentz TEM Images Using a Python Environment: *Yukun Liu*¹; Maxwell Li¹; Marc DeGraef¹; ¹Carnegie Mellon University

P3-113: Surface Modification of Iron Oxide Nanoparticles with Catechol-based Ligands for Improved Stability in Biocompatible Fluids: *Minseon (Stella) Ju*¹; Anna Samia¹; ¹Case Western Reserve University

P3-114: Spark Plasma Sintering of In Situ Nickel-Titanium-Graphite based Composites: *Amit Patil*¹; Tushar Borkar¹; ¹Cleveland State University

P3-115: Surface Modification of Na_{0.44}MnO₂ Positive Electrode Material Via Graphite for Aqueous Electrolyte Sodium-ion Batteries: *Jinming Wu*¹; Haosheng Song¹; Wei Wu¹; ¹Carnegie Mellon University

P3-116: Stabilization of Brownmillerite type SrCoO_{2.5} for Oxygen Enrichment Applications: *Arun Umarji*¹; Aswathy Narayanan¹; Rajasekar Parasuraman¹; ¹Indian Institute of Science

P3-119: Study on the Solid-state Diffusion of the Al₂O₃-TiO₂ System: *Jianchao Zheng*¹; Xiaojun Hu¹; Kuochih Chou¹; ¹University of Science and Technology Beijing

P3-120: Substitution of Critical Elements in RECo₅ based Permanent Magnet: *Kinjal Gandha*¹; Rakesh Chaudhary¹; Fanqiang Meng¹; Matthew Kramer¹; Ryan Ott¹; Cajetan Nlebedim¹; ¹Ames Laboratory

P3-121: Synergistic Antimicrobial Effect of Rambutan Peel Extract and Cinnamon Essential Oil on Properties of Whey Protein Isolate Based Film: Udomlak Sukatta¹; Prapassorn Rugthaworn¹; Nattaporn Khanookon¹; Prakit Sukyai¹; Kunat Kongsin¹; Natdanai Harnkarnsujarit¹; Rungsinee Sothornvit¹; *Rungsima Chollakup*¹; ¹KAPI, Kasetsart University

P3-122: The Assessment of Local Lattice Strains in Alloys Using Total Scattering: *Lewis Owen*¹; Howard Stone¹; Helen Playford²; ¹University of Cambridge; ²ISIS Neutron and Muon Source

P3-123: The Effect of Sn Addition on Heat Treatment of Extruded AM80 Magnesium Alloy: *Seoyeong Kim*¹; Sedong Lee¹; Duckhyun Kim¹; Ahruem Beck¹; Sugun Lim¹; ¹Gyeongsang National University

P3-124: The Influence of the Defects of MoO₃, Contact Surface and Morphology of Al to the Ignition of the Mechanical Activated Composites Al/MoO₃: *Andrey Streletskii*¹; Michail Sivak¹; ¹Institute of Chemical Physics RAS

P3-125: The Manufacture of W and Mo Layers on Metallic Sheets Through Intense Plastic Deformation Induced by Ball Collisions: *Sergey Romankov*¹; ¹Chonbuk National University

P3-126: Thermal Conductivity of Epoxy Resin Composites Filled with Combustion Synthesized AlN and h-BN Powders: *Shyan-Lung Chung*¹; Jeng-Shung Lin¹; Li-Hsuan Wei¹; Hsu-Pin Wu¹; Yu-De Wang¹; Tsung-Lin Hsieh¹; Jyun-Wei Syu¹; Wei-Lun Wang¹; Robert Yasaputera¹; ¹National Cheng Kung University

P3-127: Thermal Effects on the Structure and Magnetic Properties of Multicomponent Nanocrystalline Fe_{26.67}Co_{26.67}Ni_{26.67}Al₁₀Si₁₀ Alloy Powder: *Kathem Bazzi*¹; Anuj Rath¹; Vamsi Meka¹; Tanjore Jayaraman¹; ¹University of Michigan-Dearborn

P3-128: Transverse Rupture Strength of Ceria as a Surrogate Nuclear Fuel: *Adrianna Lupercio*¹; Jennifer Watkins¹; Jayson Foster²; Brian Jaques¹; ¹MSMSE at Boise State University and CAES; ²MSMSE at Boise State University and Dixie State University

P3-129: Tribological and Corrosive Behavior of Cold Sprayed Coating: *Harminder Singh Chouhan*¹; ¹Guru Nanak Dev University

P3-130: Understanding the Role of Lattice Activation in the Corrosion of the Mineral Chalcopyrite: *Adam Karcz*¹; Anne Juul Damø¹; Kim Dam-Johansen¹; David Chaiko²; ¹Technical University of Denmark; ²FLSmidth USA

P3-131: VO₂(M1) Thin Films Synthesized by Ultrasonic Nebulized Spray Pyrolysis of Aqueous Combustion Mixture for IR Photodetection: *Arun Umarji*¹; Inyalot Tadeo¹; Mukhokosi Panzi¹; Krupanidhi Saluru¹; ¹Indian Institute of Science

P3-132: Modified Natural Rubber Latexes for Coating Applications: *Nantana Jiratumkul*¹; Phuritchaya Sithichan¹; ¹Chulalongkorn University

P3-133: Sintering Effect on Thermal Conductivity of Metallic Powder in Laser Powder-bed Fusion: *Shanshan Zhang*¹; Brandon Lane²; Justin Whiting²; Kevin Chou¹; ¹University of Louisville; ²National Institute of Standards and Technology

P3-134: A Study on Formation of Island Shaped Surface Oxide in AHSS Steels: *Wonhwi Lee*¹; ¹POSCO

P3-135: 3D Printed ABS and Its Tensile, Creep, and Fatigue Behavior: Mingyo Jung

P3-136: 3D Printing of Zircon for Thin Walled and Biomimetic Structures: *Piyush Pai Raikar*¹; Jing Zhang¹; ¹Indiana University Purdue University Indianapolis

P3-137: Additive Manufacturing of Polymers with High Geometric Accuracy: *Xuehui Yang*¹; Jing Zhang¹; Yeon-Gil Jung²; ¹Indiana University - Purdue University Indianapolis; ²Changwon National University

P3-138: Centrifugal Weeder: *Abhilash Gulhane*¹; Jing Zhang¹; ¹IUPUI

P3-139: Effects of Octahedral Tilting/Untilting Transition on the Piezoelectricity at Morphotropic Phase Boundary: *Kang Yan*¹; Shuai Ren²; Minxia Fang²; Xiaobing Ren³; ¹Nanjing University of Aeronautics and Astronautics.; ²Xi'an Jiaotong University; ³National Institute for Materials Science

P3-140: Materials and Process Design for Metal Fused Filament Fabrication (MF3): *Paramjit Singh*¹; Sundar Atre¹; Kunal Kate¹; ¹University of Louisville

P3-141: Properties and Microstructure of Water Atomized Duplex Stainless Steel Processed by Laser-Powder Bed Fusion: *Chang woo Gal*¹; Subrata Nath¹; Harish Irrinki¹; Emma Clinning¹; Gautam Gupta¹; Sundar Atre¹; ¹University of Louisville

Light Metal Technology – Applications for the Transportation Industry — Poster Session

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

Tuesday PM
October 16, 2018
4:45 PM - 5:45 PM

Room: Hall A
Location: Greater Columbus Convention Center

P3-20: Development of the Commercial Automotive Wheel Manufacturing Process through the Lightweight Aluminum Multi-Cavity Forging Process: *Min Seok Moon*¹; GunSung Chung¹; MyeongHan Yoo¹; JoonHyuk Song¹; NaRa Park¹; WonTae Kim¹; JeHa Oh¹; JongDae Yoon²; GeeWon Kim²; DongChul Chung¹; ¹Korea Institute of Carbon Convergence; ²Rheoforge, Co., Ltd.

P3-21: Effects of the Eutectic Silicon on Microstructure Mechanical Properties of Sand Casting Al-7Si-0.35Mg Alloy during Solution Treatment: *Myounggyun Kim*¹; ¹Research Institute of Industrial Science

P3-22: In-situ Manufacturing Techniques for Aluminum Matrix Nanocomposites: *Jeremy Fedors*¹; Eunkyung Lee¹; Brajendra Mishra¹; ¹Worcester Polytechnic Institute

Materials for Nuclear Applications and Extreme Environments — Poster Session

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

Tuesday PM
October 16, 2018
12:00 PM - 1:00 PM

Room: Hall A
Location: Greater Columbus Convention Center

P2-26: Density Functional Theory Study of Tritium Solubility and Diffusivity in Lithium Aluminate and Lithium Zirconate Pellets: Hari Paudel¹; *Yueh-Lin Lee*¹; Yuhua Duan¹; ¹National Energy Technology Lab

P2-27: Microstructure Based Process Modeling and Integration of U-10%wt Mo Alloys: *Chao Wang*¹; Zhijie Xu¹; Xiaohua Hu¹; William Frazier¹; Ayoub Soulami¹; Xiaowo Wang²; Guang Cheng³; Vineet Joshi¹; ¹Pacific Northwest National Laboratory; ²Ansys Inc.; ³Independent Scholar

Materials Property Understanding through Characterization — Poster Session

Program Organizers: Indrajit Dutta, Corning Incorporated; Nicholas Smith, Corning Incorporated

Tuesday PM
October 16, 2018
12:00 PM - 1:00 PM

Room: Hall A
Location: Greater Columbus Convention Center

P2-38: Characterization of Mechanical Behavior High Strain Rate of Polymeric Foams: *Khlif Mohamed*¹; Hammami Dorra¹; Bradai Chedly²; ¹ENIS; ²Ecole Nationale D'Ingenieurs de Sfax

P2-39: Characterization of Spacecraft Materials Using Reflectance Spectroscopy: *Jacqueline Reyes*¹; ¹University of Texas El Paso

P2-40: Correlation of Physical and Mechanical Properties with Structural Changes curing Cold Deformation of 3rd Generation AHSS: *Daniel Branagan*¹; Andrew Frerichs¹; Brian Meacham¹; Sheng Cheng¹; Alla Sergueeva¹; ¹NanoSteel Company Inc

P2-41: Development and Characterization of a Mouthguard (MG) Biocomposite Made from a Polymer and a Natural Fibre: Analysis of Mechanical, Physical and Antibacterial Properties: *Alejandro Restrepo Carmona*¹; Henry Colorado¹; ¹University of Antioquia

P2-42: Dynamically Templated Acquisition of EDS X-ray Spectral Images Using Electron Image Contrast: *Stephen Seddio*¹; ¹Thermo Fisher Scientific

P2-43: Effect of Basicity and Ferro-silicon Addition Matte Formation from Ge-copper Bearing Slag: *Michel Kalenga Wa Kalenga*¹; Junior Kayembe¹; Didier Nyembwe¹; ¹University of Johannesburg

P2-44: First-Order-Reversal-Curve (FORC) Study of Magnetic Materials: *Brad Dodrill*¹; ¹Lake Shore Cryotronics

P2-45: Investigation of Transformation Plasticity Peculiarities of Alloyed Steel: *Rasa Kandrotaitė Janutiene*¹; Darius Mažeika¹; Arunas Baltušnikas²; ¹Kaunas University of Technology; ²Lithuanian Energy Institute

P2-46: Neutron Irradiation Effect on 0.4t-CT Specimen of Alloy 690 Tested at Elevated Temperature: *Joo-hag Kim*¹; ¹Korea Atomic Energy Research Institute



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POSTERS

P2-47: Structural, Electronic and Magnetic Properties of Heusler Alloys under Pressure from a Theoretical Approach: *Emilia Olivos*¹; Navdeep Singh²; Gerardo Trápaga³; D. Altamirano-Juárez⁴; Raymundo Arroyave¹; ¹Texas A&M University; ²University Of Houston; ³CINVESTAV (on sabbatical leave at CIATEQ A.C.); ⁴Universidad Tecnológica del Centro de Veracruz

P2-48: Synthesis, Characterization, and Performance of Transition Metal Sulfide-based Anodes in Electrochemical Cells: *Amanda Gibson*¹; William McCulloch²; Yiying Wu²; Vicky Doan-Nguyen³; ¹Ohio State University; ²Department of Chemistry, The Ohio State University; ³Department of Materials Science and Engineering, The Ohio State University

Mechanochemical Synthesis and Reactions in Materials Science III — Poster Session

Program Organizers: Antonio Fuentes, Cinvestav Unidad Saltillo; Laszlo Takacs, University of Maryland Baltimore County; Challapalli Suryanarayana, University of Central Florida; Huot Jacques, University Du Quebec A Trois Rivieres

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P3-24: Mechanical Activation Assisted Synthesis of Akermanite/Forsterite Nanocomposite: *Fariborz Tavangarian*¹; Sophia Novak¹; Camryn Shoppe¹; ¹Pennsylvania State University, Harrisburg

P3-25: Microstructural Evolution of Metastable Mixed Oxides in the Bi2O3-Ta2O5 System Induced by Mechanical Alloying: *Pee-Yew Lee*¹; Pei-Hao Lin¹; ¹National Taiwan Ocean University

P3-27: Synthesis and Characterization of Akermanite Powder by Mechanical Activation and Thermal Treatment: *Fariborz Tavangarian*¹; Caleb Zolko¹; ¹Pennsylvania State University, Harrisburg

Multifunctional Ceramic- and Metal-matrix Composites: Processing, Microstructure, Properties and Performance — Poster Session

Program Organizers: Martin Pech-Canul, Cinvestav IPN Saltillo; Golam Newaz, Wayne State University; Xiaoming Wang, Purdue University

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Location: Greater Columbus Convention Center

12:00 PM - 1:00 PM

Session Chair: Xiaoming Wang, Purdue University

P2-49: A Revamped Classification of Composite Materials: *Martin Pech-Canul*¹; Socorro Valdez²; Milka Acosta-Enríquez³; Héctor Hdz-García⁴; Eulices Acosta-Enriquez³; José Flores-García¹; ¹Cinvestav IPN Saltillo; ²UNAM; ³Universidad de Sonora; ⁴Corporación Mexicana de Investigación en Materiales (COMIMSA)

P2-50: CNT/Cu Composite for Improved Functional and Structural Materials: *Shengchen Xue*¹; Christopher Kovacs²; Michael Sumption²; Edward Collings²; CJ Thong³; John Phillips³; Michael Tomsic³; ¹Ohio State University; ²OSU; ³Hyper Tech Research, Inc.

P2-51: Microstructure and Mechanical Properties of Coconut Shell Reinforced Epoxy Composites: Suleiman Hassan¹; *Johnson Agunsoye*¹; Sefiu Bello²; Adekunle Adebisi³; Joseph Agboola¹; ¹University of Lagos; ²Kwara State University; ³University of Ilorin

P2-52: Updating Definitions and Concepts in the Discipline of Composite Materials: *Martin Pech-Canul*¹; Socorro Valdez²; Luis González¹; Golam Newaz³; Xiaoming Wang⁴; Carlos León-Patiño⁵; ¹Cinvestav IPN Saltillo; ²UNAM; ³Wayne State University; ⁴Purdue University; ⁵Universidad Michoacana

Multiscale Modeling of Microstructure Deformation in Material Processing — Poster Session

Program Organizers: Lukasz Madej, AGH University of Science and Technology; Krzysztof Muszka, AGH University of Science and Technology; Danuta Szeliga, AGH University of Science and Technology; Jaimie Tiley, Air Force Office of Scientific Research

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P3-28: Numerical Evaluation of Static Recrystallization Progress in Microalloyed Steels through Cellular Automata Model: *Lukasz Madej*¹; Mateusz Sitko¹; Krzysztof Muszka¹; Janusz Majta¹; ¹AGH University of Science and Technology

Neutron and Synchrotron Techniques for Advanced Materials Characterization — Poster Session

Program Organizers: Helen Playford, ISIS Facility; Lewis Owen, University of Cambridge

Tuesday PM
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P2-53: Characterizing Subsurface Dislocation Content Using Micro-lae Diffraction and Frank-bilby Streak Analysis: *Chen Zhang*¹; Shanoob Balachandran¹; Philip Eisenlohr¹; Martin Crimp¹; Carl Boehlert¹; Ruqing Xu²; Thomas Bieler¹; ¹Michigan State University; ²Argonne National Laboratory

P2-54: In-situ 3D Mapping of Spatially Resolved Stress Fields Associated with Twinning in Bulk HCP Magnesium: *M Arul Kumar*¹; Bjorn Clausen¹; Laurent Capolungo¹; Rodney McCabe¹; W Liu²; J Tischler²; Carlos Tome¹; ¹Los Alamos National Laboratory; ²Argonne National Laboratory

P2-55: In-situ Neutron Diffraction Investigation of Shear Deformation in IF and AHS Steel: *Thomas Gnaupel-Herold*¹; Justin Milner¹; ¹National Institute of Standards and Technology

P2-56: Microstructural Evolution of Ti-7Al under Cyclic Loading: *Rachel Lim*¹; Darren Pagan²; Yufeng Shen¹; Vahid Tari¹; Joel Bernier³; Robert Suter¹; Anthony Rollett¹; ¹Carnegie Mellon University; ²Cornell High Energy Synchrotron Source; ³Lawrence Livermore National Laboratory

P2-57: Texture Mapping in Electron Beam Welded Dissimilar Cu-SS Joints by Neutron Diffraction: *Soumitra Dinda*¹; Jyotirmaya Kar¹; Gour Gopal Roy¹; Prakash Srirangam²; Winfried Kockelmann³; ¹Indian Institute of Technology Kharagpur; ²University of Warwick; ³STFC-Rutherford Appleton Laboratory

P2-58: X-ray Computed Tomography and Digital Volume Correlation: Revealing Hidden Failure Mechanisms of Composites in 3D: *Brendan Croom*¹; Xiaodong Li¹; ¹University of Virginia

P2-59: X-ray Pair Distribution Function Analysis of the Chemically Induced Degradation in Alkali-activated Slags: *Kai Gong*¹; Claire E. White¹; ¹Princeton University

Next Generation Biomaterials — Poster Session

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

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12:00 PM - 1:00 PM

Session Chair: Roger Narayan, NC State University

P2-1: Effects of Cold Swaging and Annealing on the Microstructures and Mechanical Properties of Biomedical Co-Cr-Mo Alloy Rods: *Mori Manami*¹; Nanae Sato¹; Kenta Yamanaka²; Kazuo Yoshida²; Koji Kuramoto³; Akihiko Chiba²; ¹National Institute of Technology, Sendai College; ²Tohoku University; ³Eiwa Co., Ltd.

P2-2: Fabrication of Biocompatible Bijels-derived Hybrid Hydrogel Membranes for Growth Factor Delivery: Haoran Sun¹; *Min Wang*¹; ¹The University of Hong Kong

P2-3: Use of Computational Tools in the Search for the Next Generation of Materials for Regenerative Medicine Applications: *Felipe Fabricio Pacci Evaristo*¹; Wolfgang Windl¹; ¹The Ohio State University

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

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

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P3-30: Structure and Properties of Induction Sintered Copper-based Powder Metal Parts: Christian Muth¹; *Kurt Diehl*¹; Daudi Waryoba¹; ¹Pennsylvania State University

Semiconductor Heterostructures: Theory, Growth, Characterization, and Device Applications — Poster Session

Program Organizers: John Ayers, University of Connecticut; Ganesh Balakrishnan, University of New Mexico; Phil Ahrenkiel, South Dakota School of Mines & Technology

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Session Chair: John Ayers, University of Connecticut

P2-20: Carbon Doping of 2D Transition Metal Dichalcogenides by Plasma Enhanced CVD: *Yanfu Lu*¹; Susan Sinnott¹; ¹Penn State University

P2-21: Comparison of Chirped and Unchirped Superlattices as Dislocation Filters for Metamorphic in GaAs/GaAs (001) Devices: Md Tanvirul Islam¹; Xinkan Chen¹; Minglei Cai¹; *Tedi Kujofsa*¹; John Ayers¹; ¹University of Connecticut

P2-22: Plastic Flow in Lattice Mismatched III-V (001) Heterostructures: *Tedi Kujofsa*¹; John Ayers¹; ¹University of Connecticut

Sintering and Related Powder Processing Science and Technologies — Poster Session

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

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P3-31: Microstructural Evolution of WE43 Powder Processed by Spark Plasma Sintering: *Julie Soderlind*¹; ¹Department of Materials Science and Engineering

Small-scale Properties of Materials and Length-scale Phenomena — Poster Session

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

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P2-60: Effect of Sm on Mechanical Properties of Cu-Zr-Al Bulk Metallic Glasses: *Fatih Sikan*¹; Sila Atabay²; Sezer Özering¹; Ilkay Kalay³; Eren Kalay¹; ¹Middle East Technical University; ²McGill University; ³Cankaya University

P2-61: In Situ Observation of Microbuckling Failure in Carbon Fibre Reinforced Polymers: *Giorgio Sernicola*¹; Mary Ryan¹; Finn Giuliani¹; ¹Imperial College London

P2-62: Measurement of Fiber-matrix Interface Strength by In-situ Push-out Tests: *Eden Spencer*¹; Giorgio Sernicola¹; Finn Giuliani¹; Mary Ryan¹; ¹Imperial College London



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P2-63: Micropillar Compression Study of the Size and Internal Boundary Effects on the Strength of HT9 Tempered Martensitic Steel: Sangyeob Lim¹; Chansun Shin²; Hyung-Ha Jin¹; ¹Korea Atomic Energy Research Institute; ²Myongji University

P2-65: Multi-Length Scale Measurements of Mechanical Properties of Age Hardened 18Ni (350) Maraging Steel: Sepideh Parvinian¹; Ali Khosravani¹; Hamid Garmestani¹; Surya Kalidindi¹; ¹Georgia Institute of Technology

P2-66: Nanomechanically Supported Computational Modeling for Thermo-mechanical Property Design and Optimization in Small-scale Powder Metallurgy: Derek Tsaknopoulos¹; Bryer Sousa¹; Victor Champagne²; Danielle Cote¹; ¹Worcester Polytechnic Institute; ²Army Research Laboratory

P2-67: Predicting the Shape Memory Response of New Alloys: Richard Blocher¹; Anindya Ghoshal²; Muthuvel Murugan²; Luis Bravo²; Peter Anderson²; ¹Ohio State University; ²Army Research Laboratory

P2-68: The Limits of Delta-K Controlled Fatigue Crack Growth in Ultrathin Sheets: Syed Javid¹; Wade Lanning¹; Christopher Muhlstein¹; ¹Georgia Institute of Tech

Solid State Processing — Poster Session

Program Organizers: Richard Fonda, Naval Research Laboratory; Simon Larose, National Research Council Canada

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P3-32: Smoothed Particle Hydrodynamics Simulation of Additive Friction Stir Manufacturing of Aluminum Alloy 6061: George Stubblefield¹; Kirk Fraser²; Paul Allison¹; Brian Jordon¹; ¹University of Alabama; ²National Research Council Canada

Surface Properties of Biomaterials — Poster Session

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

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P2-4: Controlled Release of Sodium Bicarbonate and Doxorubicin on Osteoblast and Osteosarcoma Cell Viability Using Polycaprolactone Coatings: Dishary Banerjee¹; Susmita Bose¹; ¹Washington State University

P2-5: Enhanced in Vivo Bone and Blood Vessel Formation by Iron and Silicon Doped 3D Printed Tricalcium Phosphate Scaffolds: Susmita Bose¹; Dishary Banerjee¹; Sam Robertson¹; ¹Washington State University

P2-6: Liposome Encapsulated Curcumin for Enhanced Bone Cell - Material Interactions Using Calcium Phosphate Based Bone Grafts: Naboneeta Sarkar¹; Susmita Bose¹; ¹Washington State University

P2-7: Starch Hydroxyapatite Composite Scaffolds Utilizing a Slurry Based 3D Printer: Effects of Amylose Content on Compressive Strength: Caitlin Koski¹; Bonny Onuikwe¹; Amit Bandyopadhyay¹; Susmita Bose¹; ¹Washington State University

Surface Protection and Spray Technology for Enhanced Materials Performance: Science, Technology, and Application — Poster Session

Program Organizers: Kang Lee, NASA Glenn Research Center; Jun Song, McGill University; Yutaka Kagawa, The University of Tokyo; Dongming Zhu, NASA Glenn Research Center; Rodney Trice, Purdue University; Daniel Mumm, University of California, Irvine; Mitchell Dorfman, Oerlikon Metco (US) Inc.; Christian Moreau, Concordia University; Emmanuel Boakye, UES Inc.; Edward Gorzkowski, Naval Research Laboratory; Scooter Johnson, Naval Research Laboratory; Richard Chromik, McGill University; Stephen Yue, McGill University

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P3-33: Microstructural and Multiscale Tribological Properties of the Cold-sprayed Ti2AlC MAX Phase Coating: Archana Loganathan¹; Ashutosh Sahu²; Chris Rudolf¹; Cheng Zhang¹; Sara Rengifo¹; Tapas Laha²; Benjamin Boesl¹; Arvind Agarwal¹; ¹Florida International University; ²Indian Institute of Technology, Kharagpur

P3-34: Portable Device to Modify Rail Surface for Wear and Crack: Seky Chang¹; ¹Korea Railroad Research Institute

Synthesis, Characterization, Modeling, Properties and Applications of Functional Porous Materials — Poster Session

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

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Session Chair: Lan Li, Boise State University

P3-35: Study on Anti-impact Performance of Closed Aluminum Foam Sandwich Panels: Guo Qian¹; Yao Wenjin¹; Li Wenbing¹; Tang Jun²; Wang Xiaoming¹; ¹Nanjing University of Science and Technology; ²Nanjing CEPREI Industrial Technology Research Institute

**Ultra High Performance Metallic Systems for
Aerospace, Defense, and Automotive Applications —
Poster Session**

Program Organizers: Ali Yousefiani, Boeing Research And Technology;
Troy Topping, California State University, Sacramento; Robert Dillon, Jet
Propulsion Laboratory; Linruo Zhao, NRC Aerospace

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P3-37: The Effect of Titanium on the Tungsten-free Cobalt-base Superalloys:

*Semanti Mukhopadhyay*¹; Prafull Pandey²; Surendra Makineni³; Krishanu Biswas⁴;
Dierk Raabe⁵; Kamano Chattopadhyay²; ¹The Ohio State University; ²Indian
Institute of Science Bangalore; ³Max-Planck-Institut für Eisenforschung GmbH;
⁴Indian Institute of Technology Kanpur; ⁵Max-Planck-Institut für Eisenforschung
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