FINAL PROGRAM & EXHIBIT DIRECTORY

Technical Meeting and Exhibition

MS&T19

MATERIALS SCIENCE & TECHNOLOGY

SEPTEMBER 29 – OCTOBER 3, 2019

PORTLAND OREGON

MATSCITECH.ORG/MST19

WHERE MATERIALS INNOVATION HAPPENS

Organizers:

The American Ceramic Society www.ceramics.org

AIST Association for Iron & Steel Technology

ASM International

TMS The Minerals, Metals & Materials Society

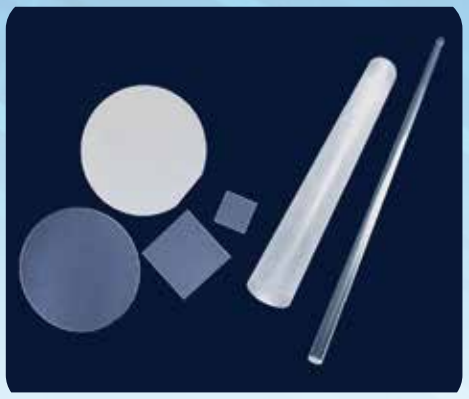
Co-Sponsored by:

NACE International The Worldwide Corrosion Authority

AdValue Technology

Booth #511

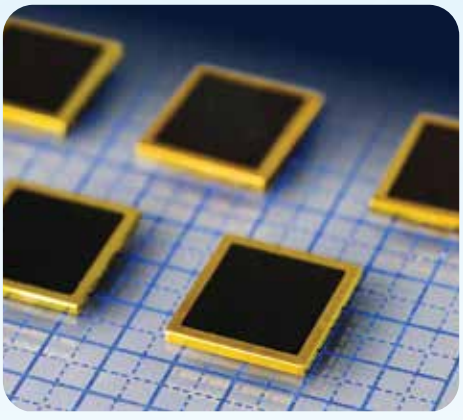
Alumina



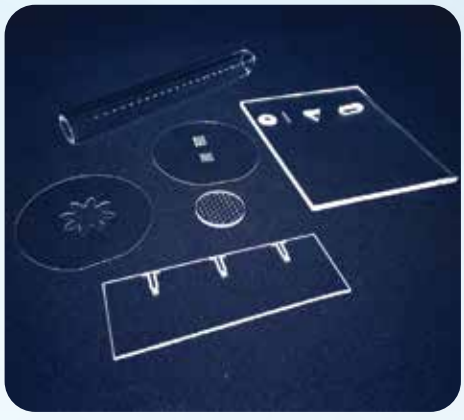
Sapphire

Quartz

High Purity Powders



Metallization



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PORTLAND OREGON

SEPTEMBER 29 – OCTOBER 3, 2019

Organizers: The American Ceramic Society www.ceramics.org; AIST Association for Iron & Steel Technology; ASM International; TMS The Minerals, Metals & Materials Society

Co-Sponsored by: NACE International The Worldwide Corrosion Authority

WELCOME TO MS&T19!

Thank you all for joining us at the 18th installment of the Materials Science & Technology (MS&T) conference series.

My colleagues and I representing the MS&T sponsoring societies on the Program Coordinating Committee have worked hard to develop a comprehensive technical program that addresses structure, properties, processing, and performance across the materials community. We encourage you to take full advantage of the collected expertise found in the 12 topic areas covered by the program. Remember, you are not confined to attending presentations at just one symposium or on a single topic, so browse all of our offerings to create a conference experience that meets your unique needs.

If you haven't already downloaded the MS&T19 conference app, I encourage you to do that today. Through it, you can build a personalized schedule on your phone or tablet that will guide you through the week and help you make the most of your conference.

We hope you enjoy exploring this year's technical program, but also be sure to make time for some of our other events:

- ***Visit the Exhibit Hall:*** *On Tuesday and Wednesday, the exhibit hall will offer lunches and a networking reception—be sure to stop and visit our exhibitors during this time or any time during exhibit hours. See the Exhibit Directory starting on page 189 to find out which companies you can meet.*
- ***Check Out Our Networking Events:*** *Receptions, luncheons, banquets, and breakfasts offer opportunities for you to meet and talk with your fellow attendees. See page xiv for a complete listing of events. Some events are free; others require tickets to attend. If a ticketed event still has openings, you can purchase a ticket at the registration desk.*
- ***Attend the Plenary Session:*** *Three respected speakers, selected by the four MS&T sponsoring societies, will deliver invited presentations at Tuesday morning's all-conference plenary session. Learn more about this year's speakers on page ii.*

On behalf of the MS&T Program Coordinating Committee, I hope you have a productive and enjoyable week.

Monica Ferraris

Chair and ACerS Representative, MS&T19 Program Coordinating Committee

PROGRAM COORDINATING COMMITTEE MEMBERS

2019 Chair and ACerS Representative
MONICA FERRARIS, Politecnico Di Torino

AIST Representative
KONSTATIN REDKIN, Whemco Inc.

ASM Representative
ANDRZEJ WOJCIESZYNSKI,
ATI Specialty Materials

TMS Representative
CARL CADY, Los Alamos National Laboratory

NACE Representative
AJIT MISHRA, Haynes International

CONTENTS

PLENARY SESSION

Tuesday, October 1 | 8:00 – 10:40 a.m. | Portland Ballroom 251/257/258

ASM/TMS DISTINGUISHED LECTURESHIP IN MATERIALS AND SOCIETY

Carolyn Hansson

Professor of Materials Engineering, University of Waterloo, Canada

The Challenge of 100 Year Service-life Requirement

Abstract *The highway authorities in Canada and the U.S. are considering raising the service-life specification for reinforced concrete highway infrastructure from the current 75 years to 100 years or more. The goals are to reduce the financial and environmental costs and improve the sustainability of the system by limiting the need for maintenance, remediation, and replacement of the structures. In coastal areas and in the northern parts of North America and Europe, the major culprit in limiting the durability of reinforced concrete is salt from seawater and de-icing agents. The chlorides destroy the natural passivity of reinforcing steel in concrete and allow active corrosion, which eventually causes cracking and spalling of the concrete. De-icing agents containing calcium- or magnesium-chloride, can attack the concrete directly. This presentation will describe the research at Waterloo on identifying the most appropriate stainless steels to combat the chloride attack over the long term.*

Biography Hansson received her B.Sc., A.R.S.M, D.I.C., and Ph.D. in metallurgical engineering from Imperial College, London. She has been employed in private sector research, a not-for-profit consulting company, and in academia. Her research has covered many aspects of environmental degradation of materials, particularly the corrosion and erosion of metals and alloys. Over the last 20 years, her major research focus has been the durability of infrastructure materials, particularly the chloride-induced corrosion of reinforcing bar and those properties of the concrete which affect this process. Her current research is focused on the application of corrosion–resistant alloys as reinforcing materials with a view to understanding the influence of the metallurgy on the corrosion resistance and prediction of the relative life-cycle costs of the different alloys.

She has served on a number of professional boards and committees, including the Natural Sciences and Engineering Council of Canada, the Minister's National Advisory Council for CANMET, the U.S. National Materials Advisory Board and the Acta Materialia Board of Governors. She is a licensed Professional Engineer in Ontario and a Chartered Engineer in the U.K. She is a member of the Order of Canada and a Fellow of the Royal Society of Canada, the Canadian Academy of Engineering, the Danish Academy of Technical Sciences, The Minerals, Metals & Materials Society, the U.K. Institute of Materials, Minerals, and Mining, and the American Concrete Institute. She was also this year's AIST Howe Memorial Lecturer.

ACERS EDWARD ORTON JR. MEMORIAL LECTURE

Minoru Tomozawa

Professor, Department of Materials Science and Engineering, Rensselaer Polytechnic Institute, USA

Glass and Water: Fast Surface Relaxation

Abstract *Water has large influence on various glass properties such as mechanical, optical, and chemical properties. Mechanical strength of glasses decreases in water or water vapor; the strength decreases with increasing loading time and crack growth rate increases in increasing water vapor. Structure and properties of glass can change with time near the glass transition temperature. This time dependence is a unique characteristic of glasses, called "relaxation," and its speed increases with increasing temperature. In the presence of water vapor, it was discovered that the relaxation of surface layer of glasses becomes much faster than that of the bulk relaxation. Correspondingly, the surface relaxation was observed at a temperature much lower than the glass transition temperature. In the present talk, this newly discovered phenomena will be discussed: the method of the measurement of surface relaxation method, its structural origin, its ap-*

plication to make stronger glass fibers, and its use to explain long standing mysteries related to mechanical properties of glasses, such as degradation of strengthened glasses, glass toughening, and fatigue limit.

Biography Tomozawa is professor of materials science and engineering at Rensselaer Polytechnic Institute. He previously worked there as associate professor (1972–1979), assistant professor (1970–1972), and as a post-doctoral research associate (1969–1970). He also served as director of Rensselaer's Center for Glass Science and Technology from 1985–1992. He received his B.S. degree in electrochemistry at Yokohama National University in Japan and his Ph.D. in metallurgy and materials science at University of Pennsylvania.

Tomozawa's primary research area is glass science. He has authored 295 technical papers, edited nine books, and currently holds three patents. He received the International Contribution Award from the Ceramic Society of Japan in 1991.

HIs current research interest is glass and water interaction. Through his work he found fast surface relaxation, which led to a new method of making stronger glass fibers and clarification of various mysteries of glasses such as fatigue limit.

Tomozawa is a Fellow of The American Ceramic Society and has been a member since 1969. He is a member of ACerS Glass & Optical Materials Division, serving as Division editor and Division chair. He received the Ceramic Educational Council Outstanding Educator Award (1988), the GOMD's George W. Morey Award (2011), and was recently elected as ACerS Distinguished Life Member (2019).

AIST ADOLF MARTENS MEMORIAL STEEL LECTURE

Wolfgang Bleck

Chair, Department of Ferrous Metallurgy, IEHK Steel Institute, RWTH Aachen University, Germany

The Fascinating Variety of New Manganese Alloyed Steels

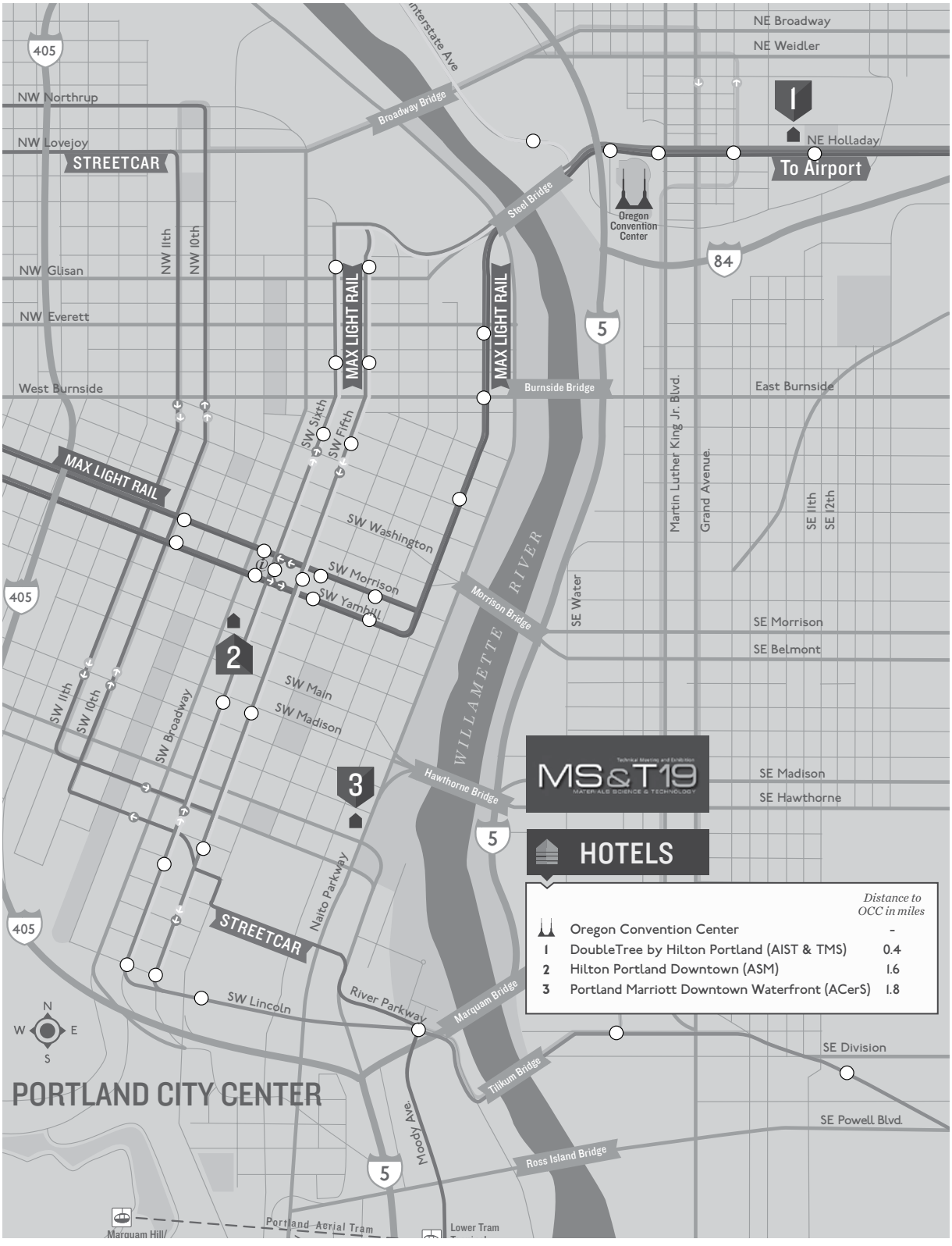
Abstract *The alloying element Manganese is used in virtually all steels for enabling hot formability, to increase hardenability or for solid solution strengthening. Optimizing the balance of conflictive mechanical properties like strength, toughness, fatigue, formability is the key issue of current steel and process development. Therefore, new steel design concepts use manganese for stabilizing the fcc phase and for adjusting the stacking fault energy. By this, phenomena such as the TRIP, TWIP, or MBIP effects are triggered. This interest in stress-controlled or strain-induced low temperature transformations of the austenite provides the basis for new steel groups like the advanced high strength steels (AHSS), which are of prime interest for sheet metal forming but also for new forging steel concepts.*

In medium and high manganese alloyed steels, new alloying concepts and new complex temperature-time-cycles during annealing have been combined for developing nanostructured matrices. A specific feature of these new materials, is that by element partitioning on the nm-scale, local enrichments of carbon and manganese can lead to a complex interplay of phases and crystal defects, providing a new promising field for future materials and process development. The strong interaction of alloying elements among themselves as well as with various crystal defects are regarded as major parameters for the control of mechanical properties. Thus, developing these new steels requires the use of the latest analytical techniques, modern microstructural description methods, advanced simulation techniques, and thorough evaluation of the local and global mechanical behavior.

The talk will provide examples of recent steel and process design with a focus on automotive car body and drive train applications.

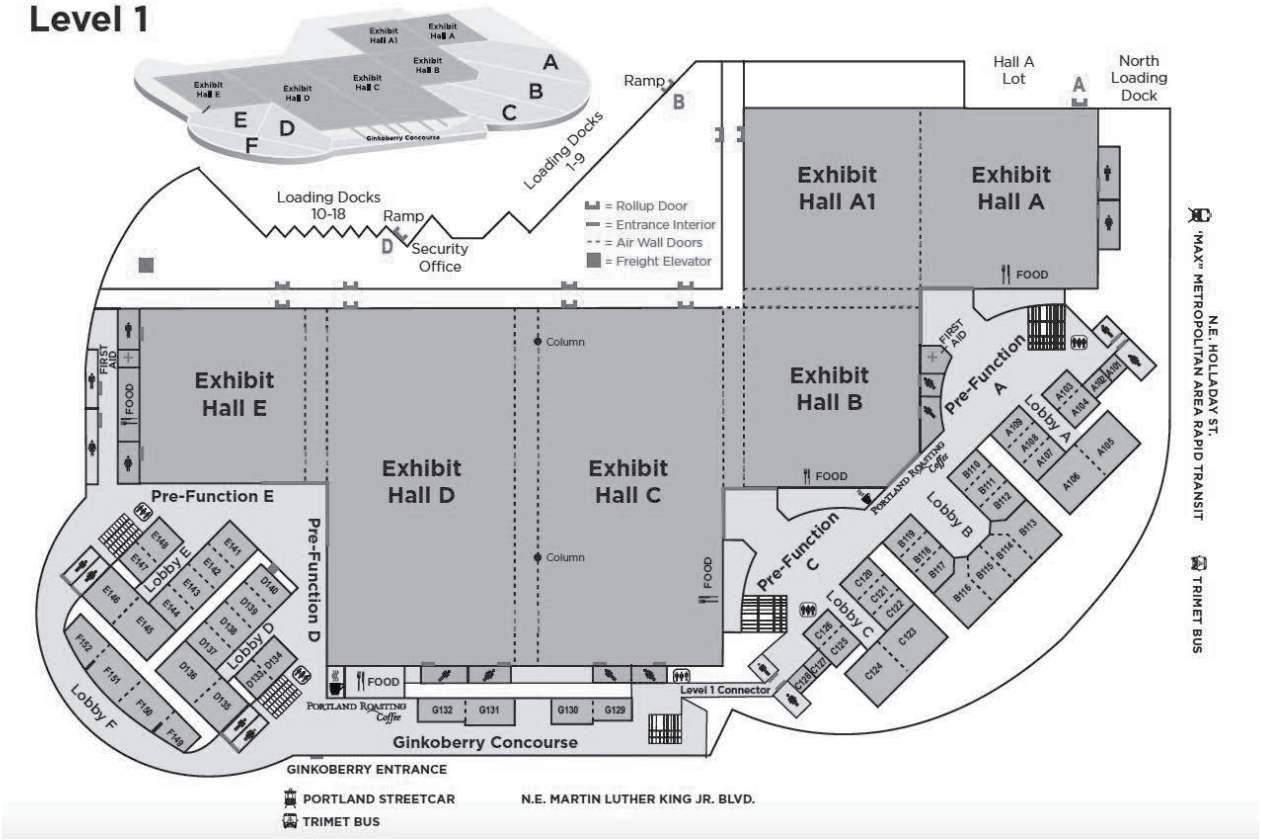
Biography Bleck received his Dr.-Ing. degree in physical metallurgy in 1979 from Clausthal University, Germany. From 1980 to 1993, he served as head of the Department of Process and Steel Development of flat-rolled products at ThyssenKrupp Stahl AG in Duisburg, Germany. Since 1994 he has been a professor of ferrous metallurgy at RWTH Aachen University. During his time at RWTH Aachen University, he has served as head of the RWTH Steel Institute; vice rector for structure, research and human resources; dean of the faculty of geo resources and materials engineering; speaker of the collaborative research center SFB 761; and member of the steering committee of the excellence cluster "production in high-wage countries." His research activities include principles of steel design, numerical modeling of material and component properties, and integrated computational materials engineering of steel processing.

NAVIGATING THE CITY

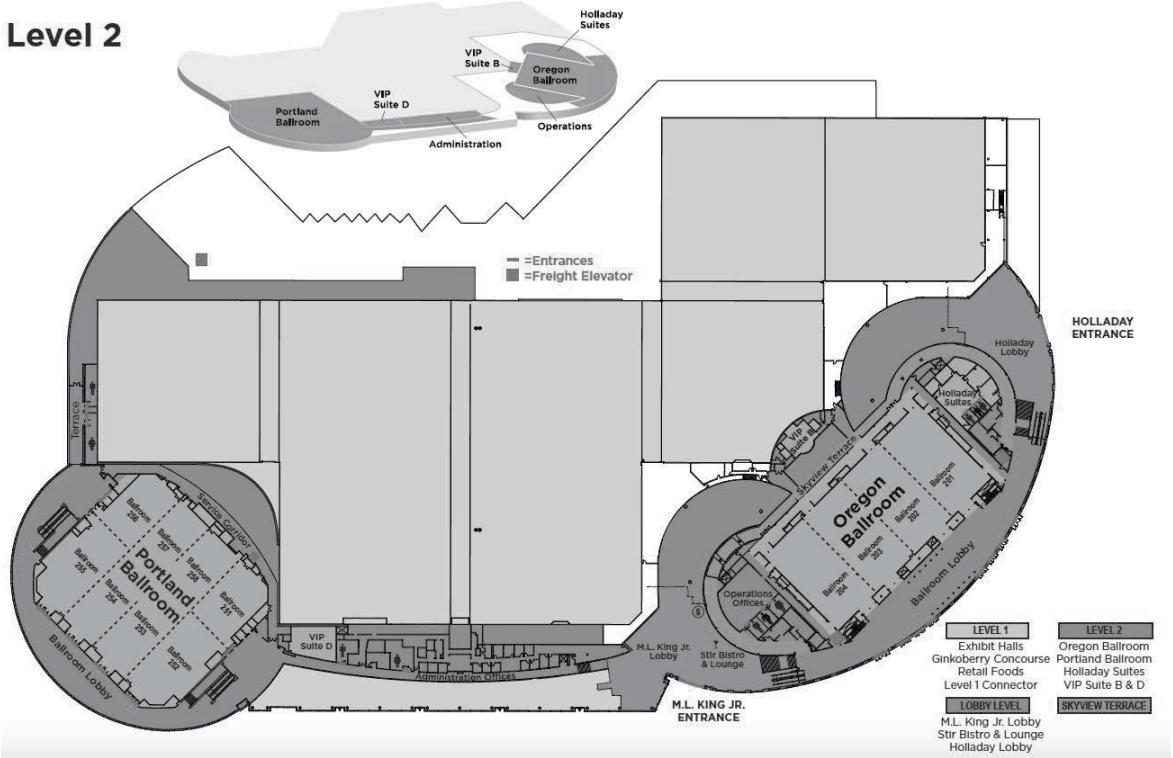


NAVIGATING THE CONVENTION CENTER

Level 1



Level 2



CONFERENCE PERKS/POLICIES

Your MS&T Full Conference Registration includes:

- MS&T Partners' Welcome Reception (Monday)
- Technical Sessions (Monday – Thursday)
- Electronic access to conference proceedings (please see below for more information)
- Exhibition & poster session
- Exhibit hall happy hour reception (Tuesday)
- Tuesday lunch ticket (full conference attendees/students/exhibitors)
- Wednesday lunch ticket (full conference attendees/exhibitors)
- Exhibition contests and activities
- Complimentary memberships* in ACerS, AIST, TMS, if selected (for non-members only)

*Non-member students receive one free year Material Advantage membership

Registration includes free
pass for Portland's MAX Light Rail, to get you to and from the conference

(Pick up at registration)

Exhibit Dates & Show Hours

Tuesday, October 1	10:00 a.m. – 6:00 p.m.
Wednesday, October 2	9:30 a.m. – 2:00 p.m.

Refreshment Breaks

Refreshments are available throughout the concourses of the Oregon Convention Center during the morning and afternoon technical session breaks on Monday, Wednesday and Thursday. The Tuesday morning coffee break will be in the exhibit hall.

Contributed Papers Online Access for Conference Registrants

MS&T19 Proceedings will be published in an online-only format. Conference registrants have free access approximately a week before the meeting through December 31, 2019. Paid access for non-registrants will be available at the same time and will continue for one year.

Society Member Lounges—Not Just for Members!

Visit ACerS, AIST, ASM, and TMS member lounges on the Oregon Convention Center Ginkoberry Concourse to:

- Meet members and society staff
- Learn about membership and benefits offered by each society
- Find books, magazines, journals, and other technical resources
- Network with colleagues

Internet Access

Complimentary WiFi access is available for MS&T19 attendees in public spaces of the Oregon Convention Center.

Meeting App

Download the MS&T19 app to serve as your hand held guide to the meeting. Search for MS&T19 in the App Store and Google Play Store. Once downloaded, log in with the email address you used at registration. App features include:

- Up-to-date program information
- Build your personal conference schedule
- Exhibitor and product details
- Special events and lectures
- Portland, Oregon information
- And much more!

Message Board

For your convenience, a message board is located near the registration area of the Oregon Convention Center to post messages for participants and attendees.

Badge Pick-up and Onsite Conference Registration

The MS&T Conference registration desk will be located in the Oregon Convention Center Prefunction C. Advance registrants may pick up badges and light rail passes at the registration area during the following hours:

Sunday, September 29	Noon – 5:00 p.m.
Monday, September 30	7:00 a.m. – 6:00 p.m.
Tuesday, October 1	7:00 a.m. – 6:00 p.m.
Wednesday, October 2	7:00 a.m. – 5:00 p.m. (note: end time is different than Mon. and Tue.)
Thursday, October 3	7:00 a.m. – Noon

Guests With Special Needs and Family Needs

ACerS, AIST, ASM, TMS, the Oregon Convention Center, and all the conference hotels strive to accommodate all guests with special needs. Two nursing suites are located near the A and E Meeting rooms on level one. Please see staff at the MS&T registration desk for assistance with any other special needs.

Audio and Visual Recording of Technical Paper Presentations/Sessions

ACerS, AIST, ASM, and TMS reserve the right to any still photography, audio, and video reproduction of presentations at every technical session. Recording of sessions (audio, video, still photography) intended for personal use, distribution, publication, or copyright is strictly prohibited without the express written consent of MS&T and the individual authors. MS&T will take photographs and video during the MS&T conference and exhibition, and reproduce them in MS&T educational, news or promotional material, whether in print, electronic or other media, including the MS&T website. By participating in the MS&T conference and exhibition, you grant MS&T the right to use your name, photograph and biography for such purposes. All postings become the property of MS&T. Postings may be displayed, distributed, or used by MS&T for any purpose.

Cellular Phone Usage

In consideration of attendees and presenters, MS&T19 organizing societies kindly request your cooperation in minimizing disturbances during technical sessions. Please place phones and other electronic devices in silent mode while you are in meeting rooms.

Be Materials-minded

MS&T19 management is committed to being environmentally responsible. Please join us in our efforts by using recycling bins located throughout the convention center.

Alumni Receptions

Purdue University is holding its reception at MS&T. For time and location, see the bulletin board near Registration.

Start in the Session Room

Presenters and session chairs are asked to report to their session rooms 30 minutes prior to the start of their sessions in order to confirm attendance, to load presentations onto the session room laptop computer, and to network. Coffee will be available in the morning at the break stations near session rooms.

Presenters and session chairs for morning sessions should report to their session rooms by 7:30 a.m. and for afternoon sessions by 1:30 p.m.

CALENDAR OF EVENTS

current as of 08-30-19 (subject to change)

Legend:

OCC = Oregon Convention Center
Doubletree by Hilton Portland= Doubletree (AIST & TMS HQ)
Portland Marriott Downtown Waterfront= (ACerS HQ)
Hilton Portland & Executive Tower= Hilton (ASM HQ)

Event	Time	Location	
FRIDAY, SEPTEMBER 27			
Committee and Business Meetings			
ACerS Executive Committee Meeting	11:00 a.m. – 5:00 p.m.	Marriott	Hawthorne
ACerS President's Council of Student Advisors (PCSA) Business Meeting	1:00 p.m. – 6:00 p.m.	Marriott	Salon GH
SATURDAY, SEPTEMBER 28			
Committee and Business Meetings			
ACerS President's Council of Student Advisors (PCSA) Business Meeting	8:00 a.m. – 5:00 p.m.	Marriott	Salon GH
ACerS Board of Directors Meeting	9:00 a.m. – 5:00 p.m.	Marriott	Salon AB
TMS Professional Registration Committee workshop and Meeting	9:00 a.m. – 5:00 p.m.	Doubletree	Idaho
ACerS PCSA/Board of Directors Lunch	Noon – 1:00 p.m.	Marriott	Salon F
TMS Professional Registration Committee dinner	6:00 p.m. – 8:00 p.m.	Off-site	TBD
Educational Courses			
Sintering of Ceramics - short course	9:00 a.m. – 4:30 p.m.	Marriott	Salon D
SUNDAY, SEPTEMBER 29			
Conference Activities			
Registration	Noon – 5:00 p.m.	OCC	Pre-Function C
Society Lounges	Noon – 5:00 p.m.	OCC	Ginkoberry Concourse
ACerS Basic Science Division Ceramographic Exhibit and Competition	Noon – 5:00 p.m.	OCC	Portland Ballroom Lobby
Programming Support Desk	2:00 p.m. – 5:00 p.m.	OCC	Pre-Function C
Educational Courses			
Introduction to Machine Learning for Materials Science	8:00 a.m. – Noon	Marriott	Salon BC
Metallography for Failure Analysis	8:30 a.m. – 4:30 p.m.	Hilton	Galleria III
Sintering of Ceramics	9:00 a.m. – 2:30 p.m.	Marriott	Salon D
Design for Advanced Manufacturing for Lightweighting Certificate	1:00 p.m. – 5:00 p.m.	Hilton	Galleria I
Additive Manufacturing Materials and Processes Workshop	1:00 p.m. – 5:00 p.m.	Doubletree	Roosevelt
Material Advantage Student Functions			
Chapter Leadership Workshop (Material Advantage Chapters officers)	10:00 a.m. – Noon	Marriott	Salon E
Undergraduate Student Speaking Contest Semi-Final 1	1:00 p.m. – 3:00 p.m.	Marriott	Mt Hood
Undergraduate Student Speaking Contest Semi-Final 2	1:00 p.m. – 3:00 p.m.	Marriott	Columbia
Undergraduate Student Speaking Contest Finals	3:00 p.m. – 4:00 p.m.	Marriott	Mt Hood
Student Networking Mixer	7:00 p.m. – 9:00 p.m.	Marriott	Salon EF
Social Functions			
MS&T Women in Materials Science Reception	5:00 p.m. – 6:00 p.m.	OCC	Portland Ballroom Lobby
TMS LGBTQ+ and Allies 0Pride Networking Mixer	8:00 p.m. – 10:00 p.m.	Offsite	TBD
Committee and Business Meetings			
ACerS Keramos National Board and Business Meeting	7:00 a.m. – 9:00 a.m.	Marriott	Restaurant
ASM Committee Council Office	7:00 a.m. – 5:00 p.m.	Hilton	Boardroom East/West
ASM IMS Board and Judges Breakfast	7:15 a.m. – 8:00 a.m.	Hilton	Executive Suite
TMS Board of Directors Meeting	7:45 a.m. – 2:00 p.m.	Doubletree	Oregon
ACerS Keramos Student Chapter Business Meeting	8:00 a.m. – 9:00 a.m.	Marriott	Salon I
AMS IMS Board Meeting	8:00 a.m. – 11:30 a.m.	Hilton	Directors Suite
Alpha Sigma Mu Board of Trustees	8:00 a.m. – Noon	Hilton	Cabinet Suite
ACerS Board of Directors and Volunteer Leaders Meeting	8:30 a.m. – Noon	Marriott	Salon F
ASM International Metallographic Contest Judging	8:00 a.m. – 5:00 p.m.	Hilton	Council Suite
TMS Superalloys 2020 Organizing Committee Meeting	8:00 a.m. – 5:00 p.m.	Doubletree	Hamilton
ACerS Keramos Convocation & Business Meeting	9:00 a.m. – 11:00 a.m.	Marriott	Salon I
ACerS President's Council of Student Advisors (PCSA) Meeting	9:00 a.m. – Noon	Marriott	Salon GH
ASM Action in Education	10:00 a.m. – 1:00 p.m.	Hilton	Senate Suite
ACerS Keramos Career Speaker	11:00 a.m. – Noon	Marriott	Salon I
ASM Annual Meeting, Awards Dinner and Leadership Luncheon Rehearsal	11:00 a.m. – 2:00 p.m.	Hilton	Galleria
ASM IMS Board and Judges Lunch	11:30 a.m. – 12:30 p.m.	Hilton	Executive Suite

Event	Time	Location	
Committee and Business Meetings			
ACerS Ceramic and Glass Industry Foundation (CGIF) Board of Directors Lunch	Noon – 1:00 p.m.	Marriott	Hawthorne/Belmont/ Laurelhurst
ACerS Publications Committee	Noon – 3:00 p.m.	Marriott	Salon A
TMS Accreditation Committee	12:30 p.m. – 2:30 p.m.	Doubletree	3 Sisters
ACerS Electronics Division Executive Committee Meeting	1:00 p.m. - 4:00 p.m.	Marriott	Eugene
ASM FAS Board Meeting	1:00 p.m. – 5:00 p.m.	Hilton	Directors Suite
ACerS Ceramic and Glass Industry Foundation (CGIF) Board of Directors Meeting	1:00 p.m. – 5:00 p.m.	Marriott	Hawthorne/Belmont/ Laurelhurst
ACerS Nuclear & Environmental Technology Division Executive Committee Meeting	2:00 p.m. – 4:00 p.m.	Marriott	Salem
ACerS Glass and Optical Materials Division Programming and Executive Committee Meeting	2:00 p.m. – 4:30 p.m.	Marriott	Portland
TMS Leadership Recruitment Committee	3:00 p.m. – 4:00 p.m.	Doubletree	Grant
ACerS/*JACerS* Editors Meeting	3:00 p.m. – 4:30 p.m.	Marriott	Salon A
ACerS Engineering Ceramics Division Executive Committee	3:00 p.m. – 4:30 p.m.	Marriott	Salon G
TMS Diversity Committee Meeting	3:00 p.m. – 4:30 p.m.	Doubletree	Mt. Bachelor
TMS ABET Refresher Training	3:00 p.m. – 5:30 p.m.	Doubletree	3 Sisters
ACerS Basic Science Division Executive Committee Meeting	3:30 p.m. – 5:30 p.m.	Marriott	Salon C
ASM JMEP Editorial Team	4:00 p.m. – 5:30 p.m.	Hilton	Cabinet Suite
TMS Program Committee Meeting	4:00 p.m. – 6:00 p.m.	Doubletree	Oregon
ASM Emerging Technologies Awareness Committee	5:00 p.m. – 7:00 p.m.	Hilton	Plaza Suite
TMS Nanomechanical Materials Behavior Committee	5:45 p.m. – 6:45 p.m.	Doubletree	Alaska
TMS Steels Committee Meeting	6:00 p.m. – 7:00 p.m.	Doubletree	Mt. Hood
TMS Materials Innovation Committee Meeting	6:00 p.m. – 7:30 p.m.	Doubletree	Washington
TMS Mechanical Behavior of Materials Committee Meeting	7:00 p.m. – 8:30 p.m.	Doubletree	Alaska
ACerS Past Presidents Council	7:00 p.m. – 8:30 p.m.	Marriott	Pearl
ASM Materials Properties Database Committee (MPDC) Meeting	7:00 p.m. – 9:30 p.m.	Hilton	Senate Suite
ASM International Materials Reviews (IMR) Committee	7:00 p.m. – 10:00 p.m.	Hilton	Directors Suite
TMS Phase Transformations Committee Meeting	7:30 p.m. – 8:30 p.m.	Doubletree	Oregon
MONDAY, SEPTEMBER 30			
Conference Activities			
Registration	7:00 a.m. – 6:00 p.m.	OCC	Pre-Function C
Programming Support Desk	7:00 a.m. – 6:00 p.m.	OCC	Pre-Function C
Society Lounges	7:00 a.m. – 6:00 p.m.	OCC	Ginkoberry Concourse
ACerS Basic Science Division Ceramographic Exhibit and Competition	8:30 a.m. – 6:00 p.m.	OCC	Portland Ballroom Lobby
MS&T Partners' Welcome Reception	5:00 p.m. – 6:00 p.m.	OCC	Ginkoberry Concourse
Exhibition			
Exhibitor Set-Up	8:00 a.m. – 5:00 p.m.	OCC	Exhibit Hall CD
Poster Installation	3:30 p.m. – 5:00 p.m.	OCC	Exhibit Hall CD
Lectures			
ACerS Navrotsky Award for Experimental Thermodynamics of Solids	8:10 a.m. – 8:55 a.m.	OCC	B119
ACerS/EPDC: Arthur L. Friedberg Ceramic Engineering Tutorial and Lecture	9:00 a.m. – 10:00 a.m.	OCC	Portland Ballroom 253
ACerS Richard M. Fulrath Award Session	2:00 p.m. – 4:40 p.m.	OCC	Portland Ballroom 253
Alpha Sigma Mu Lecture	2:30 p.m. – 4:00 p.m.	OCC	Portland Ballroom 254
Material Advantage Student Functions			
ACerS PCSA Humanitarian Pitch Competition	8:00 a.m. – 11:00 a.m.	Marriott	Mt. Hood
ACerS Lunch with a Pro	Noon – 1:00 p.m.	OCC	ACerS Lounge
AIST Student Plant Tour - EVRAZ Oregon Steel	Noon – 4:00 p.m.	OCC	MLK Lobby
Social Functions			
ASM Women in Materials Engineering Breakfast (Ticketed Event)	7:00 a.m. – 9:00 a.m.	Hilton	Grand Ballroom II
AIST University Industry Relations Roundtable	10:30 a.m. – 1:00 p.m.	Doubletree	Oregon
ASM Leadership Awards Luncheon	11:30 a.m. – 1:00 p.m.	Hilton	Grand Ballroom I
ASM Tuxedo Pick up	4:00 p.m. – 6:00 p.m.	Hilton	Senate Suite
ASM Foundation Reception	5:00 p.m. – 6:30 p.m.	Hilton	Grand Ballroom II
Purdue University Alumni and Friends Reception	6:00 p.m. – 7:30 p.m.	Offsite	Spirit of '77
AIST Steel to Students Reception	6:00 p.m. – 8:00 p.m.	Doubletree	Oregon/Alaska
ACerS Annual Honor and Awards Banquet Reception	6:45 p.m. – 7:30 p.m.	Marriott	Salon EF Prefunction
ACerS Annual Honor and Awards Banquet	7:30 p.m. – 10:00 p.m.	Marriott	Salon EF
ASM Canada Council Suite and Ice Breaker Reception	9:00 p.m. – 12:00 a.m.	Hilton	Grand Ballroom Parlor ABC"
Annual Meetings			
ACerS 121st Annual Membership Meeting	1:00 p.m. – 2:00 p.m.	OCC	Portland Ballroom 253
ASM 106th Annual Business Meeting	4:00 p.m. – 5:00 p.m.	Hilton	Grand Ballroom I
ASM IMS Annual General Meeting and Symposium Planning	5:00 p.m. – 6:00 p.m.	OCC	F152

CALENDAR OF EVENTS

current as of 08-30-19 (subject to change)

Legend:

OCC = Oregon Convention Center
Doubletree by Hilton Portland= Doubletree (AIST & TMS HQ)
Portland Marriott Downtown Waterfront= (ACerS HQ)
Hilton Portland & Executive Tower= Hilton (ASM HQ)

Event	Time	Location	
MONDAY, SEPTEMBER 30			
Committee and Business Meetings			
ACerS SPEO Meeting	7:00 a.m. – 9:00 a.m.	Marriott	Salon C
ASM Committee Council Office	7:00 a.m. – 5:00 p.m.	Hilton	Boardroom East/West
TMS Membership and Student Development Committee Meeting	7:30 a.m. – 9:00 a.m.	Doubletree	Hamilton
ASM Metallography, Microstructure and Analysis (MMA) Editorial Board	8:00 a.m. – 9:30 a.m.	Hilton	Forum Suite
ASM Foundation Campaign Meeting	8:00 a.m. – 10:00 a.m.	Hilton	Grand Ballroom Parlor C
ASM Guest Hospitality	8:00 a.m. – 10:30 a.m.	Hilton	Executive Suite
ASM Canada Council Business Meeting (ASM)	9:00 a.m. – 10:00 a.m.	Hilton	Cabinet Suite
ASM Past Presidents Meeting	9:30 a.m. – 11:00 a.m.	Hilton	Directors Suite
ASM Women in Materials Engineering Committee	10:00 a.m. – 11:00 a.m.	Hilton	Council Suite
ASM Education Meeting	10:00 a.m. – 11:00 a.m.	Hilton	Senate Suite
ACerS Member Services	10:30 a.m. – Noon	OCC	C128
ACerS Meetings Committee Meeting	10:30 a.m. – Noon	OCC	G129
TMS Executive Committee Meeting	11:30 a.m. – 1:00 p.m.	Doubletree	Madison
ACerS Basic Science Division General Membership Meeting	Noon – 1:00 p.m.	OCC	E143
ACerS Engineering Ceramics Division General Membership Meeting	Noon – 1:00 p.m.	OCC	C122
TMS Integrated Computational Materials Engineering Committee Meeting	12:15 p.m. – 1:45 p.m.	Doubletree	Alaska
ACerS Electronics Division General Membership Meeting	12:30 p.m. – 1:30 p.m.	OCC	A105
TMS Education Committee	12:30 p.m. – 2:00 p.m.	Doubletree	Grant
ASM Awards Policy Committee Meeting	1:30 p.m. – 2:30 p.m.	Hilton	Forum Suite
ASM Membership Committee	1:30 p.m. – 3:30 p.m.	Hilton	Cabinet Suite
ACerS Educational and Professional Development Council (EPDC)	2:00 p.m. – 4:00 p.m.	OCC	G129
TMS Nuclear Materials Committee	5:00 p.m. – 6:30 p.m.	Doubletree	3 Sisters
ASM AM&P Editorial Committee	5:00 p.m. – 7:00 p.m.	Hilton	Plaza Suite
ASM Processing and Application Committee Meeting	5:30 p.m. – 7:00 p.m.	Hilton	Executive Suite
TMS Composite Materials Committee	5:45 p.m. – 6:45 p.m.	Doubletree	Roosevelt
ACerS Nuclear & Environmental Technology Division General Membership Meeting	5:30 p.m. – 6:30 p.m.	OCC	E147
TMS Additive Manufacturing Committee Meeting	6:00 p.m. – 7:30 p.m.	OCC	B113
ASM Finance Committee dinner	6:00 p.m. – 9:00 p.m.	Hilton	Forum Suite
ASM Emerging Professionals Committee Business Meeting	7:00 p.m. – 9:15 p.m.	Hilton	Directors Suite
ASM Alloy Phase Diagram (APD) Committee	7:30 p.m. – 9:30 p.m.	Hilton	Council Suite
TUESDAY, OCTOBER 1			
Conference Activities			
Registration	7:00 a.m. – 6:00 p.m.	OCC	Pre-Function C
Programming Support Desk	7:00 a.m. – 6:00 p.m.	OCC	Pre-Function C
Society Lounges	7:00 a.m. – 6:00 p.m.	OCC	Ginkoberry Concourse
ACerS Basic Science Division Ceramographic Exhibit & Competition	7:00 a.m. – 6:00 p.m.	OCC	Portland Ballroom Lobby
Exhibition			
ASM Mini-Materials Camp	9:00 a.m. – 2:00 p.m.	OCC	Exhibit Hall CD
Poster Installation	10:00 a.m. – 11:00 a.m.	OCC	Exhibit Hall CD
Exhibition Show Hours	10:00 a.m. – 6:00 p.m.	OCC	Exhibit Hall CD
General Poster Session with Presenters #1	11:00 a.m. – Noon	OCC	Exhibit Hall CD
General Poster Session with Presenters #2	Noon – 1:00 p.m.	OCC	Exhibit Hall CD
MS&T Food Court	Noon – 2:00 p.m.	OCC	Exhibit Hall CD
General Poster Viewing	1:00 p.m. – 4:45 p.m.	OCC	Exhibit Hall CD
Exhibitor Networking Reception	4:00 p.m. – 6:00 p.m.	OCC	Exhibit Hall CD
General Poster Session with Presenters #3	4:45 p.m. – 5:45 p.m.	OCC	Exhibit Hall CD

Event	Time	Location	
Lectures			
MS&T Plenary Lectures	8:00 a.m. – 10:40 a.m.	OCC	Portland Ballroom 251/257/258
TMS Young Professional Tutorial Luncheon (ticketed)	Noon – 12:45 p.m.	OCC	G130
TMS Young Professional Tutorial Lecture (open)	12:45 p.m. – 2:00 p.m.	OCC	G130
ASM Edward DeMille Campbell Memorial Lecture	12:45 p.m. – 1:45 p.m.	OCC	Portland Ballroom 254
ACerS Frontiers of Science and Society - Rustum Roy Lecture	1:00 p.m. – 2:00 p.m.	OCC	Portland Ballroom 253
IMS Henry Clifton Sorby Lecture (ASM)	2:00 p.m. – 3:00 p.m.	OCC	F152
ACerS GOMD Alfred R. Cooper Award Session	2:00 p.m. – 4:40 p.m.	OCC	A106
Material Advantage Student Functions			
Material Advantage Committee Meeting	7:30 a.m. – 8:30 a.m.	OCC	G129
ASM DomesDay Competition	10:15 a.m. – 1:30 p.m.	OCC	Exhibit Hall CD
Undergraduate Student Poster Contest judging	10:00 a.m. – 11:00 a.m.	OCC	Exhibit Hall CD
Graduate Student Poster Contest judging	10:00 a.m. – 11:00 a.m.	OCC	Exhibit Hall CD
Undergraduate Student Poster Contest display with presenters	11:00 a.m. – Noon	OCC	Exhibit Hall CD
Graduate Student Poster Contest display with presenters	11:00 a.m. – Noon	OCC	Exhibit Hall CD
Mug Drop Contest	11:15 a.m. – 12:15 p.m.	OCC	Exhibit Hall CD
Disc Golf Contest	12:30 p.m. – 1:30 p.m.	OCC	Exhibit Hall CD
Undergraduate Student Poster Contest display	Noon – 6:00 p.m.	OCC	Exhibit Hall CD
Graduate Student Poster Contest display	Noon – 6:00 p.m.	OCC	Exhibit Hall CD
Student Awards Ceremony	2:00 p.m. – 3:00 p.m.	OCC	Exhibit Hall CD
Social Functions			
ASM Tuxedo Pick Up	11:00 a.m. – 5:00 p.m.	Hilton	Senate Suite
ASM Board of Trustees Photograph	6:00 p.m. – 6:30 p.m.	Hilton	Executive Suite
ASM Awards Dinner Reception	6:00 p.m. – 7:15 p.m.	Hilton	Grand Ballroom Foyer
ASM Head Table Line Up	6:45 p.m. – 7:15 p.m.	Hilton	Grand Ballroom Parlor C
ASM Awards Dinner	7:00 p.m. – 9:30 p.m.	Hilton	Grand Ballroom I/II
ASM President's Reception	9:30 p.m. – 11:30 p.m.	Hilton	Skyline I/II
Committee and Business Meetings			
ASM Board, Finance, Investment & Past President's Breakfast	7:00 a.m. – 8:00 a.m.	Hilton	Skyline I
ACerS Diversity & Inclusion Sub-Committee Meeting	7:00 a.m. – 8:00 a.m.	OCC	C128
ASM Committee Council Office	7:00 a.m. – 5:00 p.m.	Hilton	Boardroom East/West
ASM Journal of Failure Analysis & Prevention (JFAP) Editorial Board	8:00 a.m. – 9:00 a.m.	Hilton	Directors Suite
ASM and Foundation Leadership Operations Review	8:00 a.m. – 10:30 a.m.	Hilton	Skyline II
ASM Volunteerism Planning Meeting	8:30 a.m. – 10:30 a.m.	Hilton	Plaza Suite
ASM Handbook and Technical Book Committee	8:00 a.m. – Noon	Hilton	Cabinet Suite
ASM Materials Education Foundation Board of Trustees	10:00 a.m. – 2:00 p.m.	Hilton	Council Suite
ASM Finance Committee Meeting	11:00 a.m. – 12:30 p.m.	Hilton	Forum Suite
ASM Joining of Advanced and Specialty Materials	Noon – 1:30 p.m.	Hilton	Grand Ballroom Parlor C
ASM *Journal of Materials Engineering & Performance* (JMEP) Committee	Noon – 2:15 p.m.	Hilton	Plaza Suite
AIST Metallurgy - PPA Committee Meeting	Noon – 2:00 p.m.	OCC	Portland Ballroom 256
TMS Powder Materials Committee Meeting	12:30 p.m. – 2:00 p.m.	Doubletree	3 Sisters
ACerS Bioceramics Division General Business Meeting	1:00 p.m. – 2:00 p.m.	OCC	C122
ASM & Foundation Investment Committee Meeting	1:00 p.m. – 2:30 p.m.	Hilton	Forum Suite
TMS ICTP 2020 Organizer Meeting	2:00 p.m. – 3:00 p.m.	Doubletree	Washington
ASM Board of Trustees Meeting	2:30 p.m. – 4:30 p.m.	Hilton	Grand Ballroom Parlor AB
TMS *Metallurgical and Materials Transactions* Board of Review	3:00 p.m. – 4:00 p.m.	Doubletree	Oregon
ACerS Panel of Fellows Meeting	3:00 p.m. – 5:00 p.m.	OCC	A101
ASM Student Board Member Meeting	3:30 p.m. – 4:45 p.m.	Hilton	Grand Ballroom Parlor C
ACerS/JACerS Associate Editors Meeting	3:30 p.m. – 5:00 p.m.	OCC	G129
ASM Content Committee Meeting	4:00 p.m. – 5:30 p.m.	Hilton	Cabinet Suite
ACerS Glass and Optical Materials Division General Business Meeting	4:45 p.m. – 5:45 p.m.	OCC	A106
TMS Titanium Committee Meeting	5:00 p.m. – 6:00 p.m.	Doubletree	Mt. Hood
TMS Surface Engineering Committee Meeting	5:00 p.m. – 6:00 p.m.	Doubletree	Roosevelt
TMS High Temperature Alloys Committee Meeting	5:00 p.m. – 6:00 p.m.	Doubletree	3 Sisters
TMS Shaping & Forming Committee Meeting	5:00 p.m. – 6:30 p.m.	Doubletree	Alaska
TMS Refractory Metals & Materials Committee Meeting	6:00 p.m. – 7:00 p.m.	Doubletree	Jefferson/Adams
TMS Corrosion & Environmental Effects Committee Meeting	6:00 p.m. – 7:00 p.m.	Doubletree	Oregon
TMS Biomaterials Committee Meeting	6:00 p.m. – 7:00 p.m.	Doubletree	Hamilton

CALENDAR OF EVENTS

current as of 08-30-19 (subject to change)

Legend:

OCC = Oregon Convention Center
Doubletree by Hilton Portland= Doubletree (AIST & TMS HQ)
Portland Marriott Downtown Waterfront= (ACerS HQ)
Hilton Portland & Executive Tower= Hilton (ASM HQ)

Event	Time	Location	
WEDNESDAY, OCTOBER 2			
Conference Activities			
Registration	7:00 a.m. – 5:00 p.m.	OCC	Pre-Function C
Programming Support Desk	7:00 a.m. – 6:00 p.m.	OCC	Pre-Function C
Society Lounges	7:00 a.m. – 5:00 p.m.	OCC	Ginkoberry Concourse
ACerS Basic Science Division Ceramographic Exhibit & Competition	7:00 a.m. – 5:00 p.m.	OCC	Portland Ballroom Lobby
Exhibition			
General Poster Viewing	9:30 a.m. – 2:00 p.m.	OCC	Exhibit Hall CD
Exhibition Show Hours	9:30 a.m. – 2:00 p.m.	OCC	Exhibit Hall CD
ASM Mini-Materials Camp	9:00 a.m. – 2:00 p.m.	OCC	Exhibit Hall CD
MS&T Food Court	Noon – 2:00 p.m.	OCC	Exhibit Hall CD
General Poster Session Removal	2:00 p.m. – 3:00 p.m.	OCC	Exhibit Hall CD
Exhibitor Tear-Down	2:00 p.m. – 9:00 p.m.	OCC	Exhibit Hall CD
Lectures			
ACerS Basic Science Division Robert B. Sosman Lecture	1:00 p.m. – 2:00 p.m.	OCC	Portland Ballroom 253
Material Advantage Student Functions			
ACerS Student Tour - Pacific Northwest National Laboratory	6:00 a.m. – 7:30 p.m.	Marriott	Lobby
Undergraduate Student Poster Contest Display	9:30 a.m. – 2:00 p.m.	OCC	Exhibit Hall CD
Graduate Student Poster Contest Display	9:30 a.m. – 2:00 p.m.	OCC	Exhibit Hall CD
ACerS Lunch with a Pro	Noon – 1:00 p.m.	OCC	ACerS Lounge
Social Functions			
ASM Tuxedo Drop-Off	7:00 a.m. – Noon	Hilton	Boardroom East/West
Committee and Business Meetings			
ASM Board of Trustees and 2019 Class of Fellows Breakfast	8:00 a.m. – 9:00 a.m.	Hilton	Forum Suite
ASM Committee Council Office	7:00 a.m. – Noon	Hilton	Boardroom East/West
ASM Acta Board of Governors Meeting	7:00 a.m. – 4:00 p.m.	Hilton	
TMS Financial Planning Committee Meeting	8:00 a.m. – 10:30 a.m.	Doubletree	Roosevelt
ASM Programming Committee	11:30 a.m. – 1:00 p.m.	Hilton	Director's Suite
TMS Industrial Advisory Committee	Noon – 4:00 p.m.	Doubletree	Hamilton
ASM FAS General Membership Meeting	6:30 p.m. – 7:30 p.m.	Hilton	Pavilion Ballroom West
ASM FAS Programming Committee Meeting	7:30 p.m. – 9:00 p.m.	Hilton	Pavilion Ballroom West
THURSDAY, OCTOBER 3			
Conference Activities			
Registration	7:00 a.m. – Noon	OCC	Pre-Function C
Programming Support Desk	7:00 a.m. – Noon	OCC	Pre-Function C
ACerS Basic Science Division Ceramographic Exhibit & Competition	7:00 a.m. – Noon	OCC	Portland Ballroom Lobby

LECTURES

(all are located in the convention center)

MONDAY, SEPTEMBER 30

ACerS NAVROTSKY AWARD FOR EXPERIMENTAL THERMODYNAMICS OF SOLIDS
8:10 – 8:55 a.m. | B119

– **Alexander Beutl**, Institute of Inorganic Chemistry-Functional Materials, University of Vienna, Austria
A Novel Apparatus for Coulometric Titrations in Lithium Containing Systems

ACerS/EPDC ARTHUR L. FRIEDBERG CERAMIC ENGINEERING TUTORIAL AND LECTURE
9:00 – 10:00 a.m. | Portland Ballroom 253

– **Kathleen Richardson**, University of Central Florida, USA
Redefining Material Design Paradigms for Next Generation Optical Materials

ACerS RICHARD M. FULRATH AWARD SESSION
2:00 – 4:40 p.m. | Portland Ballroom 253

– **Manabu Fukushima**, National Institute of Advanced Industrial Science and Technology, Japan
Engineering Cellular Ceramics with Modulated Pore Configurations

– **Keigo Suzuki**, Murata Manufacturing Co. Ltd., Japan
Fabrication and Characterization of Nanoscale Dielectrics for the Design of Advanced Ceramic Capacitors

– **Ronald Polcawich**, Defense Advanced Research Projects Agency (DARPA), USA
Piezoelectric Thin Film Processing, PiezoMEMS Devices, and an Overview of PRIGM, SHRIMP, & AMEBA Programs

– **Koichiro Morita**, Taiyo Yuden Co. Ltd., Japan
Dielectric Material Design and Lifetime Prediction for Highly Reliable MLCCS

– **Vilas Pol**, Purdue University, USA
Engineered Ceramic Materials for Energy Storage

ALPHA SIGMA MU LECTURE
2:30 – 4:00 p.m. | Portland Ballroom 254

– **Diana Lados**, **FASM**, Worcester Polytechnic Institute, USA
The Role of Additive Manufacturing in Industry 4.0: From Integrated Design and Fabrication to Structural Performance and Qualification

TUESDAY, OCTOBER 1

MS&T PLENARY SESSION
8:00 a.m. – 10:40 a.m. | Portland Ballroom 251/257/258

ASM/TMS DISTINGUISHED LECTURESHIP IN MATERIALS AND SOCIETY

– **Carolyn Hansson**, Professor of Materials Engineering, University of Waterloo, Canada
The Challenge of 100 Year Service-life Requirement

ACerS EDWARD ORTON JR. MEMORIAL LECTURE

– **Minoru Tomozawa**, Professor, Department of Materials Science and Engineering, Rensselaer Polytechnic Institute, USA
Glass and Water: Fast Surface Relaxation

AIST ADOLF MARTENS MEMORIAL STEEL LECTURE

– **Wolfgang Bleck**, Chair, Department of Ferrous Metallurgy, IEHK Steel Institute, RWTH Aachen University, Germany
The Fascinating Variety of New Manganese Alloyed Steels

ASM EDWARD DEMILLE CAMPBELL MEMORIAL LECTURE
12:45 p.m. – 1:45 p.m. | Portland Ballroom 254

– **Katherine Faber**, **FASM**, California Institute of Technology, USA
Breaking Old Barriers: New Opportunities in Brittle Fracture

ACerS FRONTIERS OF SCIENCE AND SOCIETY – RUSTUM ROY LECTURE
1:00 p.m. – 2:00 p.m. | Portland Ballroom 253

– **Jennifer Lewis**, Harvard University, USA
Printing Architected Matter in Three Dimensions

ASM-IMS HENRY CLIFTON SORBY LECTURE
2:00 p.m. – 3:00 p.m. | F152

– **Helmut Clemens**, Montanuniversitaet Leoben, Austria
Development and Characterization of High-performance Materials by Means of Cross-scale Metallography and Complementary Methods

ACerS GOMD ALFRED R. COOPER AWARD SESSION
2:00 p.m. – 4:40 p.m. | A106

COOPER DISTINGUISHED LECTURE

– **Kathleen Richardson**, University of Central Florida, USA
Function-tailoring Strategies for Broadband Infrared Glasses

2019 ALFRED R. COOPER YOUNG SCHOLAR AWARD PRESENTATION

– **Wataru Takeda**, Coe College, USA
Topological Constraint Model of High Lithium Content Borate Glasses

WEDNESDAY, OCTOBER 2

ACerS BASIC SCIENCE DIVISION ROBERT B. SOSMAN LECTURE
1:00 p.m. – 2:00 p.m. | Portland Ballroom 253

– **Yury Gogotsi**, Drexel University, USA
Nanomaterials Born from Ceramics: Transformative Synthesis of Carbons, Carbides and Nitrides

SPECIAL EVENTS

SUNDAY, SEPTEMBER 29

MS&T Women in Materials Science Reception
5:00 p.m. – 6:00 p.m. | OCC – Portland Ballroom lobby
Enjoy the chance to network with professionals and peers in a relaxed environment.

TMS LGBTQ+ and Allies Networking Mixer
8:00 p.m. – 10:00 p.m. | Off-site – TBD
Enjoy an evening of informal networking at a local venue to celebrate shared experiences as LGBTQ+ individuals and allies. Cash bar. Organized by TMS Pride of the TMS Diversity Committee.

MONDAY, SEPTEMBER 30

ACerS Basic Science Division Ceramographic Exhibit and Competition
OCC – Portland Ballroom Lobby
Join us for this intriguing annual poster exhibit that promotes the use of microscopy and microanalysis as tools in the scientific investigation of scientific materials.

Monday: 8:30 a.m. – 6:00 p.m.
Tuesday: 7:00 a.m. – 6:00 p.m.
Wednesday: 7:00 a.m. – 5:00 p.m.

ASM Women in Materials Breakfast (ticketed event)
7:00 a.m. – 9:00 a.m. | Hilton Grand Ballroom
Join your colleagues for a lively discussion of relevant topics with featured speakers. This breakfast sells out each year, so make sure to reserve your tickets ahead of time with your MS&T19 registration.

Things to do in Portland Presentation
9:00 a.m. – 10:00 a.m. | OCC – G130
Tim Mongin with Travel Portland will discuss all the great things to do in Portland during your visit!

ASM Leadership Awards Luncheon (ticketed event)
11:30 a.m. – 1:00 p.m. | Hilton Grand Ballroom
ASM's organizational unit awards, as well as awards and scholarships of the ASM Materials Education Foundation will be presented. ASM's incoming committee/council chairs will also be recognized for their leadership.

ACerS 121st Annual Membership Meeting
1:00 p.m. – 2:00 p.m. | OCC – Portland Ballroom 253
The president reports on Society activities and newly elected officers take their positions during the annual membership meeting. All ACerS members and guests are welcome.

ASM 106th Annual Business Meeting
4:00 p.m. – 5:00 p.m. | Hilton Grand Ballroom 1
Officers will be elected for the 2019-2020 term, as well as other ASM business transactions. ASM members and guests are welcome.

MS&T Partners' Welcome Reception
5:00 p.m. – 6:00 p.m. | OCC – Ginkoberry Concourse
Grab this opportunity to mingle with members and representatives from all five societies and MS&T partners at this reception in the society lounge area.

MONDAY, SEPTEMBER 30

AIST Steel to Students Reception
6:00 p.m. – 8:00 p.m. | DoubleTree by Hilton Hotel Portland, Oregon Room
Students with an interest in steel are encouraged to attend this networking event.

ACerS Annual Honor and Awards Banquet (ticketed event)
6:45 p.m. – 10:00 p.m. | Marriott – Salon EF

Enjoy dinner, conversation, and the presentation of Society awards. You can purchase tickets with your MS&T registration.

(Reception) 6:45 – 7:30 p.m.

(Banquet) 7:30 -10:00 p.m.

TUESDAY, OCTOBER 1

TMS Young Professional Tutorial Luncheon/Lecture
(ticketed event)
Noon – 2:00 p.m. | OCC – G130
Speaker: **Mark Asta**, University of California, Berkeley; Organized by the TMS Young Professionals Committee

MS&T19 Exhibit Happy Hour Reception
4:00 p.m. – 6:00 p.m. | OCC Hall CD
Network with colleagues and build relationships with qualified attendees, buyers, and prospects.

ASM Awards Dinner/Reception
6:15 p.m. – 9:00 p.m. | Hilton Grand Ballroom I/II
Join ASM in celebrating the accomplishments of this year's award recipients and the 2019 Class of Fellows. Tickets, which include the President's Reception following the dinner can be purchased with MS&T registration.

(Reception) 6:15 p.m. – 7:00 p.m. | Foyer
(Banquet) 7:00 p.m. – 9:00 p.m. (invitation only)

STUDENT EVENTS

Undergraduate Student Poster Contest
The contest encourages undergraduate students to present their undergraduate research experiences and improve their communication skills. The poster entered must be the work of an undergraduate and completed during the student's undergraduate education. Work presented in the poster does not have to be performed at the student's home institution, but could be, for example, from a project performed as part of a co-op experience, a summer internship, or a Research Experience for Undergraduates (REU) project.

Graduate Student Poster Contest
The contest, open to current graduate students pursuing M.S. or Ph.D. degrees, recognizes superior research performed during graduate study. Posters must be accepted in the MS&T technical program to be entered into the contest. Entries will be displayed in the general poster session.

Sunday, September 29

Chapter Officer Workshop – *FOR CHAPTER OFFICERS ONLY*
10:00 a.m. – Noon | Marriott – Salon E
Meet fellow chapter officers, share best practices, and learn about Material Advantage! This workshop is for chapter officers only (chair, vice-chair, secretary, and treasurer). Registration is required for this workshop.

Undergraduate Student Speaking Contest
1:00 p.m. – 4:00 p.m. | Marriott – Mt. Hood/Columbia
MS&T hosts the semifinal and final rounds of the Material Advantage Undergraduate Student Speaking Contest. This contest encourages undergraduate students to present technical papers and improve their presentation skills. The presentation subject must be technical but can relate to any aspect of materials science and engineering. One contestant per university competes in this contest.

Student Networking Mixer
7:00 p.m. – 9:00 p.m. | Marriott – Salon EF
Join in this relaxed, casual, and fun atmosphere designed for students, Material Advantage Faculty Advisors, and society volunteer leaders. Students are encouraged to wear their school colors. Music will be provided.

Monday, September 30

MS&T Partners' Welcome Reception
5:00 p.m. – 6:00 p.m. | OCC-Ginkoberry Concourse
Meet with members and representatives from the MS&T organizing societies and partners at this reception.

Emerging Professionals Symposium
Be sure to attend the symposium *Perspectives for Emerging Materials Professionals* in room B110! Several sessions have been developed to help students and young professionals navigate their career in the materials science profession.

ACerS PCSA Humanitarian Pitch Competition — *NEW*
8:00 a.m. – 11:00 a.m. | Marriott – Mt. Hood
The President's Council of Student Advisors (PCSA) is hosting the inaugural Humanitarian Pitch Competition for students to pitch their ideas to a panel of judges about how they can address a challenge that a community is experiencing. By utilizing their material engineering background, they should aim to show how improved materials/processes will benefit the community in need. Both undergraduate and graduate students are eligible to participate.

ACerS Lunch with a Pro
Noon – 1:00 p.m. | OCC – ACerS Lounge
To foster relationships between students and professionals in the field, ACerS Young Professionals Network (YPN) will pair students with industry, national lab, and academia professionals over lunch. This is an opportunity for students to ask candid questions about careers in materials science in an informal, intimate setting. Lunch is on your own, as the YPN will simply be linking students with professionals. Students should meet at the ACerS Lounge at noon.

AIST Student Plant Tour
Noon – 4:00 p.m. | OCC –MLK Lobby
AIST will offer students the opportunity to tour EVRAZ Oregon Steel—a plate, coil, and large diameter pipe manufacturer for energy and industrial end markets. Advance registration is required.

Tuesday, October 1

Ceramic Mug Drop Contest
11:15 a.m. – 12:15 p.m. | OCC – Exhibit Hall CD
Mugs fabricated by students from ceramic raw materials are judged on aesthetics and breaking thresholds. Mugs are dropped from varying levels until the breaking threshold is reached. The mug with the highest successful drop distance wins!

Ceramic Disc Golf Contest
12:30 p.m. – 1:30 p.m. | OCC – Exhibit Hall CD
This contest is sure to draw a crowd! Students create discs from ceramic or glass materials to meet certain specifications; the discs are then thrown into a regulation disc golf basket. Each disc will be judged in the categories of farthest distance achieved and artistic merit (aesthetics). The disc that is successfully thrown into the disc golf basket from the farthest distance in the fewest number of shots will be named winner of the Ceramic Disc Golf Contest; the most aesthetically pleasing/creative disc will be recorded as "Best Looking" disc.

ASM Geodesic Dome Design Competition "DomesDay"
10:15 a.m. – 1:30 p.m. | OCC – Exhibit Hall CD
Can these domes take the weight? Join us in the exhibit hall for the display, judging, and selection of winners at the annual ASM Geodesic Dome Design Competition! For more information, visit www.asminternational.org/domesday.

Student Awards Ceremony
2:00 p.m. – 3:00 p.m. | OCC – Exhibit Hall CD
Congratulate the winners of this year's contests: Material Advantage Chapters of Excellence, Student Speaking Contest, Graduate and Undergraduate Poster Contests, Ceramic Mug Drop Contest, Ceramic Disc Golf Contest, TMS Superalloys Awards, AIST/AISI Scholarships, and Keramos National Awards.

Wednesday, October 2

ACerS Lunch with a Pro
Noon – 1:00 p.m. | OCC – ACerS Lounge
To foster relationships between students and professionals in the field, ACerS Young Professionals Network (YPN) will pair students with industry, national lab, and academia professionals over lunch. This is an opportunity for students to ask candid questions about careers in materials science in an informal, intimate setting. Lunch is on your own, as the YPN will simply be linking students with professionals. Students should meet at the ACerS Lounge at noon.

ACerS Student Tour
6:00 a.m. – 7:30 p.m. | Marriott – Lobby
Pacific Northwest National Laboratory (PNNL)
ACerS President's Council of Student Advisors (PCSA) offers students an opportunity to attend an all-day tour at the Pacific Northwest National Laboratory in Richland, Washington. The tour is open to all MS&T19 student registrants. Advance registration is required.

SHORT COURSES

SATURDAY, SEPTEMBER 28

***Sintering of Ceramics* (ACerS)**

Ricardo Castro, University of California, Davis
9:00 a.m. – 4:30 p.m. | **Marriott Salon D**

This course will focus on the principles and practices of sintering, the important roles it plays in other processes, such as additive manufacturing, nanotechnology, and thin films, and the challenges encountered in the powder sintering process. Students will also learn how to solve problems encountered in producing required target microstructures.

SUNDAY, SEPTEMBER 29

***Introduction to Machine Learning for Materials Science* (ACerS)**

Joshua Tappan, Bryce Meredig, Citrine Informatics;
John Mauro, Pennsylvania State University
8:00 a.m. - Noon | **Marriott Salon BC**

Attendees will get an overview of machine learning and materials informatics with a focus on tools, platforms, and applications for ceramic and glass research. Instructors will also share case studies and success stories of machine learning in glass and ceramics research.

***Metallography for Failure Analysis* (ASM)**

Frauke Hogue, FASM, Hogue Metallography
8:30 a.m. – 4:30 p.m. | **Hilton Portland Downtown Galleria III**

This full-day short course will start with a short discussion of documentation for failure investigation followed by suggestions for sample preparation techniques, specific for failure analysis such as fracture cleaning and replication, and different etchants for different purposes. The influence of various manufacturing techniques on the microstructure will be discussed and demonstrated including manufacturing and processing imperfections such as cracks, folds, IGA, decarburization. Additionally, the basic structures of various alloys, their heat treatment, and mechanical properties and failure modes are discussed (steels, cast irons, tool steels, stainless steels, super alloys, titanium, copper, and aluminum). Over two dozen case studies of failures will be presented. In each case, metallography plays a major role.

Net Shape Forming-Conventional Processes or Additive Manufacturing? **(ASM)**

Howard A. Kuhn, FASM, University of Pittsburgh, America Makes
8:30 a.m.–4:30 p.m. | **Hilton Portland Downtown Forum Suite**

This full-day short course will aid decisions on adoption of Additive Manufacturing (AM) for production of mechanical and thermal load-bearing parts from the perspective of traditional net shape forming. Beyond the basic knowledge of net shape forming and AM materials and process capabilities, we focus on the shape and material flexibilities of AM to develop a design and manufacturing mindset able to capitalize on design for functionality, optimum-shape processing, leaner manufacturing, and greater sustainability values. Additive manufacturing options are illustrated through successful AM applications, and examples are given of AM for production of tooling for conventional net-shape processes, repair of conventionally manufactured parts, and hybrid (additive/subtractive) manufacturing. Cost comparisons of conventional and AM processes will be given along with supply chain considerations in adoption of AM. Attendees will be able to describe the terminology and physical concepts of both net shape forming and metal additive manufacturing processes; understand the differences between design for manufacturing by net-shape processing and design for functionality by AM; describe the circumstances leading to successful AM applications; recognize opportunities for AM in production of tooling for conventional processes, repair of conventional parts, and hybrid additive/subtractive manufacturing; adapt to the supply chain anomalies of AM; and evaluate the potential for success of AM in a given application.

Sintering of Ceramics **(ACerS)**

Ricardo Castro, University of California, Davis
9:00 a.m. – 2:30 p.m. | **Marriott Salon D**

Additive Manufacturing Materials and Processes **(TMS)**

David L. Bourell, University of Texas at Austin; **Sudarsanam Suresh Babu**, University of Tennessee-Knoxville; **Kirk Rogers**, The Barnes Group Advisors
1:00 p.m. – 5:00 p.m. | **Doubletree Roosevelt**

The purpose of this popular workshop is to familiarize participants with current Additive Manufacturing (AM) processes; current AM practice for metals, polymers, and ceramics; modeling of AM processes, microstructural evolution, and service properties; and current challenges and research opportunities.

Design for Advanced Manufacturing for Lightweighting Certificate **(ASM)**

Sunniva Collins, Ph.D., FASM, Case Western Reserve University
1:00 p.m. – 5:00 p.m. | **Hilton Portland Downtown Forum Suite**

This half-day short course will cover where Additive Manufacturing (AM) technologies can be applied for design or economic advantage. Understand lightweighting AM technologies, trends and applications in transportation industries. Demonstrate problem-solving skills in lightweighting through analysis of case studies. Learn the fundamentals of materials science and how to improve properties such as strength, stiffness and ductility in a wide array of lightweight material options. Attendees will be able to understand the use of advanced materials databases (e.g., Granta) and the impact of key market drivers on the selection criteria for critical applications in the transportation industry. Additionally, learn practical uses of AM and advanced materials in advanced manufacturing and how to diagnose and solve practical problems using AM. Gain insights into practical problems through case study analysis.

THURSDAY, OCTOBER 3

Electroceramics in Modern Technology: Applications and Impact **(ACerS)**

R.K. Pandey, Texas State University
8:00 a.m. – 4:30 p.m. | **Marriott Hawthorne/Laurelhurst**

This course covers perovskite oxides, leading members of the electroceramic group, and applications related to emerging electronics and sensor technology. In-depth discussions will include applications like spintronics, magneto-electronics, thin film transparent transistors, actuators and transducers, ceramic transistors, and magnetic sensors. Includes the book, *Fundamentals of Electroceramics: Materials, Devices, and Applications* by the instructor.

FRIDAY, OCTOBER 4

Electroceramics in Modern Technology: Applications and Impact **(ACerS)**

R.K. Pandey, Texas State University
8:00 a.m. – Noon | **Marriott Hawthorne/Laurelhurst**

UPCOMING CONFERENCES

Event	Date	Location/Sponsor
Energy and Utilities — Industry Insights and Fundamentals	October 7–10, 2019	Oak Ridge, Tenn., USA – AIST
Engineering Solutions for Sustainability: Materials and Resources 4	October 13–16, 2019	Indianapolis, Ind., USA – AIST
Secondary Steelmaking Refractories — A Practical Training Seminar	October 14–17, 2019	San Antonio, Texas, USA – AIST
Heat Treat 2019	October 15–17, 2019	Detroit, Mich., USA – ASM
Hot Rolling Fundamentals — A Practical Training Seminar with Plate Rolling Fundamentals	October 20–24, 2019	Michigan City, Ind., USA – AIST
Continuous Casting — A Practical Training Seminar	October 21–24, 2019	Memphis, Tenn., USA – AIST
AIST European Steel Forum	October 23–25, 2019	Leoben, Austria – AIST
80th Conference on Glass Problems	October 28–31, 2019	Columbus, Ohio, USA – ACerS
Making Shaping and Treating of Steel:101	October 29–30, 2019	Milwaukee, Wis., USA – AIST
Managing Technology — ArcelorMittal Dofasco G.P.	November 5–7, 2019	Hamilton, Ontario, Canada – AIST
ISTFA 2019	November 10–14, 2019	Portland, Ore., USA – ASM
World Congress on High Entropy Alloys (HEA 2019)	November 17-20, 2019	Seattle, Wash., USA – TMS
ASM Global Materials Summit	December 3–5, 2019	Marco Island, Fla., USA – ASM
Electronic Materials and Applications 2020 (EMA 2020)	January 22–24, 2020	Orlando, Fla., USA – ACerS
44th International Conference and Expo on Advanced Ceramics and Composites (ICACC 2020)	January 26–31, 2020	Daytona Beach, Fla., USA – ACerS
Modern Electric Furnace Steelmaking — A Practical Training Seminar	February 3–7, 2020	Portland, Ore., USA – AIST
Long Products Rolling — A Practical Training Seminar	February 10–13, 2020	Jacksonville, Fla., USA – AIST
TMS 2020 Annual Meeting & Exhibition (TMS2020)	February 23–27, 2020	San Diego, Calif., USA – TMS
The Making, Shaping and Treating of Steel: 101	February 24, 2020	Richmond, Va., USA (tentative) – AIST
Cold Rolling Fundamentals — A Practical Training Seminar	March 1–6, 2020	Charleston, S.C., USA – AIST
Scrap Supplements and Alternative Ironmaking	March 2–4, 2020	Lake Buena Vista, Fla., USA – AIST
Heat Treat Mexico	March 3–5, 2020	Queretaro, Mexico – ASM
Digital Transformation Forum for the Steel Industry	March 16–19, 2020	Pittsburgh, Pa., USA – AIST
Shape Memory Regional Conference	May 4–5, 2020	Palm Springs, Calif., USA – ASM
AeroMat 2020	May 4–6, 2020	Palm Springs, Calif., USA – ASM
AISTech 2020	May 4–7, 2020	Cleveland, Ohio, USA – AIST
6th Ceramics Expo	May 5–6, 2020	Cleveland, Ohio, USA – ACerS
Ceramic Manufacturing Solutions Conference	May 6–7, 2020	Cleveland, Ohio, USA – ACerS
2020 Glass and Optical Materials Division Annual Meeting (GOMD2020)	May 17–21, 2020	New Orleans, La., USA – ACerS
27th Crane Symposium	June 7–9, 2020	Pittsburgh, Pa., USA – AIST
International Thermal Spray Conference	June 10–12, 2020	Vienna, Austria – ASM
Congress on Safety in Engineering and Industry 2020: Leading Safety into the Future	June 21–24, 2020	Philadelphia, Pa., USA – AIST/TMS
5th International Congress on 3D Materials Science (3DMS 2020)	June 28–July 1, 2020	Washington, D.C., USA – TMS
Long and Forged Products	July 12–15, 2020	Vail, Colo., USA – AIST
Pan American Ceramics Congress and Ferroelectrics Meeting of the Americas (PACC-FMAs 2020)	July 19–23, 2020	Panama City, Panama – ACerS
The 13th International Conference on the Technology of Plasticity	July 26–31, 2020	Columbus, Ohio, USA – TMS
Materials Challenges in Alternative & Renewable Energy 2020 (MCARE2020) combined with the 4th Annual Energy Harvesting Society Meeting (AEHSM 2020)	August 16–21, 2020	Bellevue, Wash., USA – ACerS
The 14th International Symposium on Superalloys (Superalloys 2020)	September 13–17, 2020	Seven Springs, Pa., USA – TMS
IMAT 2020 – International Materials Applications & Technologies Conference & Expo	September 14–17, 2020	Cleveland, Ohio, USA – ASM
Sheet Processing and Finishing Lines	September, 2020	Columbus, Ohio, USA – AIST
MS&T20	October 4–8, 2020	Pittsburgh, Pa., USA – MS&T Team
MS&T21	October 17–21, 2021	Columbus, Ohio, USA – MS&T Team

ORGANIZED BY THE LEADING MATERIALS SOCIETIES:

The American Ceramic Society is the premier global membership organization for the technical ceramics and glass community. Celebrate with us Monday evening at ACerS 121st Annual Honors and Awards Banquet for the induction of the 2019 Class of Fellows and awards presentations. The Society's prestigious award lectures will be presented at MS&T19: **ACerS/EPDC Arthur L. Friedberg Ceramic Engineering Tutorial and Lecture, Frontiers of Science and Society—Rustum Roy Lecture, Edward Orton, Jr. Memorial Lecture, Robert B. Sosman Lecture**, and ACerS' newest award, **Navrotsky Award for Experimental Thermodynamics of Solids**. All attendees are welcome to attend the ACerS lectures. Be sure to stop by the member lounge to relax between sessions, network with peers, hear what's new with the Society, and more. **ceramics.org**

The **Association for Iron & Steel Technology** is a non-profit entity with over 17,500 members from more than 70 countries. AIST is recognized as a global leader in networking, education and sustainability programs for advancing iron and steel technology. Serving the entire iron and steel community, including steel manufacturers, suppliers, consumers and academics, our mission is to advance the technical development, production, processing and application of iron and steel. The Iron and Steel symposia is just one of the highlights for AIST members. The **Adolf Martens Memorial Steel Lecture** is part of the plenary session beginning at 8 a.m. on Tuesday, October 1. Students with an interest in steel are encouraged to attend the Steel to Students Reception on Monday, 30 September! **AIST.org**

ASM International (ASM) is the world's largest and foremost professional technical society serving the information needs of scientists, engineers, and technicians who develop, test, select, and apply advanced materials, including metals, composites, polymers, and ceramics. With over 25,000 members and 80-plus professional chapters worldwide, ASM engages and connects members to a global network of peers and provides access to trusted materials information through reference content and data, education courses, international events, and applied research. Join us Monday for the **ASM Women in Materials Engineering Breakfast**, the **Alpha Sigma Mu Lecture**, and attend the **ASM Leadership Awards Luncheon**, where ASM Materials Education Foundation, Committee/Council and ASM organizational unit awards will be presented. Attend **ASM's Annual Meeting** where officers will be elected for the 2019-2020 term. On Tuesday, attend the **ASM/TMS Distinguished Lecture** in Materials and Society as included in the Plenary Session. Additionally, ASM will host the **ASM Dome Design Competition** sponsored by the ASM Student Board Members, and the **Edward DeMille Campbell Memorial Lecture** will be presented. You won't want to miss the **ASM Awards Dinner** on Tuesday evening! Join us in celebrating the accomplishments of this year's award recipients and the 2019 Class of Fellows. Tickets, which include the President's Reception, can be purchased via the registration form. **asminternational.org**

The Minerals, Metals & Materials Society (TMS) is a member-driven international professional society dedicated to fostering the exchange of learning and ideas across the entire range of minerals, metals, and materials science and engineering, from minerals processing and primary metals production, to basic research and the advanced applications of materials. Included among its nearly 14,000 professional and student members are metallurgical and materials engineers, scientists, researchers, educators, and administrators from more than 80 countries on six continents. TMS invites attendees to join us on Tuesday for the **TMS Young Professional Tutorial Lecture**, featuring Mark Asta from the University of California, Berkeley, and for the **ASM/TMS Joint Distinguished Lecture in Materials and Society**, delivered by the University of Waterloo's Carolyn Hansson as part of the MS&T plenary session. **TMS.org**

CO-SPONSORED BY:

NACE International, The Worldwide Authority Corrosion Society, is the world's largest and most recognized association for corrosion control. With over 36,000 members in 140 countries, NACE International is dedicated to protecting people, assets and the environment from the effects of corrosion. The association is involved in every industry and area of corrosion prevention and control, from chemical processing and water systems, to transportation and infrastructure protection. **nace.org**

WHERE MATERIALS INNOVATION HAPPENS

MS&T20

pittsburgh pennsylvania

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Organizers:

The American Ceramic Society
www.ceramics.org

AIST
ASSOCIATION FOR IRON & STEEL TECHNOLOGY

TMS
The Minerals, Metals & Materials Society

TECHNICAL PROGRAM

Technical Meeting and Exhibition

MS&T19

MATERIALS SCIENCE & TECHNOLOGY

SEPTEMBER 29 – OCTOBER 3, 2019

PORTLAND OREGON

MATSCITECH.ORG/MST19

WHERE MATERIALS INNOVATION HAPPENS

Organizers:

The American Ceramic Society www.ceramics.org

AIST Association for Iron & Steel Technology

ASM International

TMS The Minerals, Metals & Materials Society

Co-Sponsored by:

NACE International The Worldwide Corrosion Authority

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Additive Manufacturing of Miscellaneous Non-ferrous Alloys	WED	AM	B115	80
Additive Manufacturing: Design, Modeling, Simulations, Defects and Inspection	WED	PM	B115	101
Additive Manufacturing of Composite Materials and Composite Like Structures	THU	AM	B115	119
Additive Manufacturing: Materials, Solidification, Controlled Growth, Properties and Testing	THU	AM	B114	120
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Advanced Materials for Oil and Gas Applications - Performance and Degradation	TUE	PM	B111	63
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Session III	WED	PM	C126	113
Session IV	THU	AM	C126	128
Late News Poster Session				
Nanomaterials	TUE	AM	Exhibit Hall CD	138
Processing and Manufacturing				
11th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing				
Novel Materials Processing Paradigm I	MON	AM	Portland Ballroom 255	16
Novel Materials Processing Paradigm II	MON	PM	Portland Ballroom 255	38
Novel Materials Design for Sustainable Society	TUE	PM	Portland Ballroom 255	58
Energy, Sustainability, and Biobased Materials I	WED	AM	Portland Ballroom 255	77
Energy, Sustainability, and Biobased Materials II	WED	PM	Portland Ballroom 255	99
Design and Development of Sustainable Technologies	THU	AM	Portland Ballroom 255	119
Poster Session	TUE	PM	Exhibit Hall CD	138
Advanced Manufacturing, Processing, Characterization and Modeling of Functional Materials				
Additive Manufacturing of Functional Materials	WED	AM	D136	82
NiTiHf Alloys	WED	PM	D136	103
Magnetic and Other SMAs	THU	AM	D136	121
Poster Session	TUE	PM	Exhibit Hall CD	141
Advances in Surface Engineering				
Session I	MON	AM	D137	22
Poster Session	TUE	PM	Exhibit Hall CD	142
Boron Based Materials and Coatings: Structure, Properties, Processing, and Applications				
Boron Based Materials and Coatings: Structure, Properties, Processing, and Applications	TUE	PM	E141	65
Joining of Advanced and Specialty Materials XXI				
Friction and Friction Stir Welding I	MON	AM	Portland Ballroom 252	29
Friction and Friction Stir Welding II / Welding Proceses	MON	PM	Portland Ballroom 252	50
Welding in the Automotive Industry / Joining, Brazing and Adhesive of Advanced Materials	TUE	PM	Portland Ballroom 252	70
Micro and Nano-Joining / Steel Welding I	WED	AM	Portland Ballroom 252	91

	Date	StartTime	Room	Page
Welding Metallurgy / Steel Welding II	WED	PM	Portland Ballroom 252	111
Dissimilar Materials Joining	THU	AM	Portland Ballroom 252	127
Poster Session	TUE	PM	Exhibit Hall CD	143
Light Metal Technology				
Aluminum Technology	TUE	PM	D138	70
Magnesium Technology	WED	AM	D138	92
Processing Technology I	WED	PM	D138	112
Processing Technology II	THU	AM	D138	128
Poster Session	TUE	PM	Exhibit Hall CD	144
Mechanochemical Synthesis and Reactions in Materials Science IV				
Session I	MON	AM	E141	31
Session II	MON	PM	E141	52
Poster Session	TUE	PM	Exhibit Hall CD	144
Metal and Polymer Matrix Composites IV				
Polymer Matrix Composites I	MON	AM	D136	31
Polymer Matrix Composites II	MON	PM	D136	52
Metal Matrix Composites	TUE	PM	D136	71
Metamorphic Manufacturing – Incremental Deformation Processing for Agile, High-quality Metallic Component Production				
Metamorphic Manufacturing I: Concepts and Pathways	MON	AM	D138	32
Metamorphic Manufacturing II: Microstructures by Design	MON	PM	D138	52
Multifunctional Ceramic- and Metal-matrix Composites: Processing, Microstructure, Properties and Performance				
Characterization and Properties of Ceramic and Metal Matrix Composites	MON	AM	C125	33
Poster Session	TUE	PM	Exhibit Hall CD	145
Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals				
Metal Injection Moulding and Powder Processing	TUE	PM	F149	74
Powder Metallurgy of Titanium, Aluminium, Magnesium and Calcium I	WED	AM	D135	94
Powder Metallurgy of Titanium, Aluminium, Magnesium and Calcium II	WED	PM	D135	115
Powder Metallurgy of Superalloys, Amorphous Metal Powder and Molybdenum-Silicon-Boron Alloy	THU	AM	D135	129
Poster Session	TUE	PM	Exhibit Hall CD	145
Processing and Performance of Materials Using Microwaves, Electric and Magnetic Fields, Ultrasound, Lasers, and Mechanical Work – Rustum Roy Symposium				
Session I	MON	AM	D139	35
Session II	MON	PM	D139	55

	Date	StartTime	Room	Page
Session III	TUE	PM	D139	74
Poster Session	TUE	PM	Exhibit Hall CD	145
Sintering and Related Powder Processing Science and Technologies				
Fundamentals of Sintering	TUE	PM	E142	75
Characterization of Sintering	WED	AM	E142	95
Advanced Sintering Techniques	WED	PM	E142	117
SPS Sintering	THU	AM	E142	130
Poster Session	TUE	PM	Exhibit Hall CD	145
Surface Protection for Enhanced Materials Performance: Science, Technology, and Application				
CMAS Degradation and Mitigation / Environmental Barrier Coatings	TUE	PM	D137	76
Thermal Barrier Coatings / Ceramic Coatings Formed by Aerosol Deposition I	WED	AM	D137	96
Ceramic Coatings Formed by Aerosol Deposition II / Coatings and Surface Modifications for Oxidation, Corrosion, and Wear Resistance	WED	PM	D137	117
Poster Session	TUE	PM	Exhibit Hall CD	146
Synthesis, Characterization, Modeling and Applications of Functional Porous Materials				
Porous Materials I	WED	AM	D139	97
Porous Materials II	WED	PM	D139	118
Porous Materials III	THU	AM	D139	131
Poster Session	TUE	PM	Exhibit Hall CD	146
Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications				
Shape Memory Alloys, Bulk Metallic Glasses and Functionally Graded Materials	MON	AM	D140	37
Titanium, Aluminum and Hierarchical Materials	MON	PM	D140	57
High Entropy Alloys and High Temperature Materials	TUE	PM	D140	77
Ultrafine Grain and Severe Plastic Deformation Influence on Materials	WED	AM	D140	98
Poster Session	TUE	PM	Exhibit Hall CD	146
Late News Poster Session				
Processing and Manufacturing	TUE	PM	Exhibit Hall CD	149
Special Topics				
Activating Allies: Navigating the Intersectional Landscape of Diversity & Inclusion				
Abolishing the "Other" - How Intersectionality Challenges Our Current Approaches to Inclusion of People of Minority Identity	MON	PM	A104	39
Curricular Innovations and Continuous Improvement of Academic Programs (and Satisfying ABET along the Way): The Elizabeth Judson Memorial Symposium				
ABET Changes and Visit Success	MON	AM	A108	24
Improving Materials Education	MON	PM	A108	46

	Date	StartTime	Room	Page
Global Young Investigators Forum				
Global Young Investigator's Forum: Session I	WED	AM	A109	89
Global Young Investigator's Forum: Session II	WED	PM	A109	109
Poster Session	TUE	AM	Exhibit Hall CD	134
Journal of the American Ceramic Society Awards Symposium				
JACerS Award Symposium Session I	WED	AM	A107	91
JACerS Award Symposium Session II	WED	PM	A107	112
Perspectives for Emerging Materials Professionals				
Session I	MON	AM	B110	34
Session II	MON	PM	B110	55
Undergraduate Global University				
What to Expect Post Bachelor's Degree I	MON	AM	A103	38
What to Expect Post Bachelor's Degree II	MON	PM	A103	58

11th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Novel Materials Processing Paradigm I

Program Organizers: Surojit Gupta, University of North Dakota; Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technololgy; John Wolodko, University of Alberta; Christopher Taylor, DNV GL; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin; 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 AM
September 30, 2019

Room: Portland Ballroom 255
Location: Oregon Convention Center

Session Chairs: Junichi Tatama, Yokohama National University; Yiquan Wu, Alfred University; Bai Cui, University of Nebraska-Lincoln; Manabu Fukushima, National Institute of Advanced Industrial Science and Technology

8:00 AM
Manufacturing Potential of Flash Sintering: *Rishi Raj*[1]; [1]University of Colorado

8:20 AM Invited
Laser Shock Processing of Ceramic Materials: *Bai Cui*[1]; Fei Wang[1]; Xueliang Yan[1]; Chenfei Zhang[1]; Leimin Deng[1]; Michael Nastasi[1]; Yongfeng Lu[1]; [1]University of Nebraska Lincoln

8:40 AM Invited
Mechanism of Microwave Activation on Molybdenite: Shuang-ping Yang[1]; *Qihang Liu*[1]; Miao Wang[1]; [1]Xi'an University of Architecture and Technology

9:00 AM Invited
Pressureless Densification, Microstructure Tailoring and Performance Optimization of Ta0.8Hf0.2C Solid Solution Ultra-high Temperature Ceramics: *Jie Yin*[1]; Xuejian Liu[1]; Zhengren Huang[1]; [1]Shanghai Institute of Ceramics Chinese Academy of Sciences

9:20 AM
Properties, Microstructures and Modeling of Gelation-freezing Derived Ceramic Thermal Insulators: *Manabu Fukushima*[1]; Hideki Hyuga[1]; Yu-ichi Yoshizawa[1]; [1]National Institute of Advanced Industrial Science and Technology (AIST)

9:40 AM Invited
Processing of ZnS and Cr-doped ZnS Infrared Transparent Ceramics: *Yiyu Li*[1]; Yiquan Wu[1]; [1]Alfred University

10:00 AM Invited
Novel Single Crystals for Electro-optical Applications: Growth and Characterization: *Kiyoshi Shimamura*[1]; Encarnación García Víllora[1]; [1]National Institute for Materials Science

10:20 AM Break

10:40 AM Invited
Improving the Accident-tolerance of Zircaloy Cladding by Gradient Ceramic Coating: *Jie Zhang*[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

11:00 AM Invited
Polymer Derived High Temperature Ti-SiOC: *Kathy Lu*[1]; Ni Yang[1]; [1]Virginia Polytechnic Institute

11:20 AM Invited
Reaction-bonded Microwave and Flash Sintering of SiC-B4C Composites: *Raymond Brennan*[1]; Selva Raju[2]; Michael Kornecki[3]; [1]U.S. Army Research Laboratory; [2]ORAU; [3]SURVICE Engineering

11:40 AM Invited
Synthesis of Coarser and Equiaxed h-BN Particles from B_4C by Adding Alkali Earth Compounds and Firing in NH_3 Gas: *Junichi Tatami*[1]; Midori Sotokawa[1]; Takanoki Wakata[1]; Motoyuki Iijima[1]; [1]Yokohama National University

12:00 PM Invited
Towards the Processing of Transparent Ceramics without Pressure Assisted Sintering: *Ricardo Castro*[1]; Joao Rodrigues Neto[1]; [1]University of California, Davis

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

Monday AM
September 30, 2019

Room: Portland Ballroom 253
Location: Oregon Convention Center

9:00 AM Invited
Redefining Material Design Paradigms for Next Generation Optical Materials: *Kathleen Richardson*[1]; [1]University of Central Florida

Additive Manufacturing Education — Session I

Program Organizers: Somayeh Pasebani, Oregon State University; Hang Yu, Virginia Polytechnic Institute and State University; Amy Elliott, Oak Ridge National Laboratory

Monday AM
September 30, 2019

Room: B111
Location: Oregon Convention Center

Session Chairs: Amy Elliott, Oak Ridge National Laboratory; Hang Yu, Virginia Polytechnic Institute and State University

8:00 AM Invited
Additive Manufacturing Education at Georgia Tech: *David Rosen*[1]; [1]Georgia Institute of Technology

8:30 AM Invited
Data Analytics for Metal Additive Manufacturing: *Amir Mostafaei*[1]; Nihal Sivakumar[1]; David Crockett[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

9:00 AM Invited
Engineering Better Additive Manufacturing Education: Leveraging Research-based Approaches to Prepare the Future Workforce: *Nicholas Meisel*[1]; [1]Pennsylvania State University

9:30 AM Invited
Additive Manufacturing in Capstone Design Projects at Materials Innovation Guild @ University of Louisville: *Vamsi Balla*[1]; Kunal Kate[1]; Sundar Atre[1]; [1]University of Louisville

10:00 AM Break

10:30 AM Invited
Hands-on Additive Manufacturing Education for Undergraduate Materials Engineers: *Zachary Cordero*[1]; [1]Rice University

11:00 AM Invited
Meta-crystals: Damage-tolerant Architected Lattice Materials and Its Educational Use in Visualising Crystal Microstructure: *Chen Liu*[1]; Jedsada Lertthanasarn[1]; Minh-Son Pham[1]; [1]Imperial College London

Additive Manufacturing of Glass, Ceramics and Composites — Additive Manufacturing of Glass, Ceramics and Composites I

Program Organizers: Tobias Schaedler, Hrl Laboratories Llc; Matthew Dickerson, Air Force Research Laboratory; Rebecca Dylla-Spears, Lawrence Livermore National Laboratory; Chang-Jun Bae, Korea Institute of Materials Science (KIMS)

Monday AM
September 30, 2019

Room: B113
Location: Oregon Convention Center

Session Chair: Tobias Schaedler, HRL Laboratories, LLC

8:00 AM Invited
Additive Manufacturing of Multi-functional Materials by Design: from Smart Materials to Assembly-free Transducers: *Xiaoyu Zheng*[1]; [1]Virginia Tech

8:30 AM
Additive Manufacturing of Ferroelectric Oxides and Ceramic Matrix Composites: *Tulsi Patel*[1]; John Bowen[1]; S. Pamir Alpay[2]; Rainer Hebert[2]; Matthew Dickerson[1]; [1]Air Force Research Laboratory; [2]University of Connecticut

8:50 AM
Improving Crystallographic Alignment and Piezoelectric Properties in Direct Written Piezoelectric Ceramics: *Rebecca Walton*[1]; Michael Brova[1]; Beecher Watson[1]; Elizabeth Kupp[1]; Richard Meyer[2]; Gary Messing[1]; [1]The Pennsylvania State University; [2]The Applied Research Laboratory at Penn State

9:10 AM
Ceramic Fused Filament Fabrication (CF3) 3D Printing of NiO-YSZ Structures for Solid Oxide Fuel Cells: Noah Wright[1]; Paramjot Singh[1]; Jacob Zimmerman[1]; Vamsi Balla[1]; Alex Bates[1]; Sam Park[1]; Rak-Hyun Song[1]; *Kunal Kate*[1]; [1]University of Louisville

9:30 AM
Zetamix: 3D Printing of Dense Ceramics by Fused Filament Fabrication: Julien Source[1]; *Yogesh Ramadoss*[1]; [1]NANOE

9:50 AM
Additive Manufacturing of High-temperature Ceramics for Aerospace Applications: *Lisa Rueschhoff*[1]; Connor Wyckoff[1]; Matthew Dickerson[1]; [1]Air Force Research Laboratory

10:10 AM Break

10:30 AM Invited
Design for Ceramic Additive Manufacturing: *Shawn Allan*[1]; [1]Lithoz America, LLC

11:00 AM
Small-scale TZP Architectures Manufactured Via Stereolithography: *Hunter Rauch*[1]; Hang Yu[1]; Huachen Cui[1]; Xiaoyu Zheng[1]; [1]Virginia Tech

11:20 AM
Additive Manufacturing of Multi-material Systems for Aerospace Applications: *Michael Halbig*[1]; Mrityunjay Singh[2]; [1]NASA Glenn Research Center; [2]Ohio Aerospace Institute

Additive Manufacturing of Metals: Microstructure and Material Properties of Nickel-based Alloys — Optimization of AM Processes for Ni-based Alloys

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

Monday AM
September 30, 2019

Room: B117
Location: Oregon Convention Center

Session Chair: Andrzej Wojcieszynski, ATI Specialty Materials

8:00 AM
Processing Optimization for Additive Manufacturing of Nickel Superalloys: *Dongsheng Li*[1]; Gopal Das[1]; Seyed Nikham[2]; Tom Maloney[3]; [1]Advanced Manufacturing LLC; [2]Western New England University; [3]Connecticut Center of Advanced Technology

8:20 AM
Effects of Laser Processing Parameters and Build Orientation on the Surface Roughness and High-cycle Fatigue Life of Inconel 718 Manufactured Using Laser Powder Bed Fusion: *Dillon Watring*[1]; Kristen Carter[1]; Dustin Crouse[2]; Ashley Spear[1]; [1]Department of Mechanical Engineering, University of Utah; [2]Metals Customer Innovation Center, 3D Systems

8:40 AM
The Effect of Static Magnetic Field on Electron Beam Melting Process of Ti6Al4V: *Shuang Han*[1]; Qiang Zhu[1]; [1]Southern University of Science and Technology

9:00 AM
Wire-arc Additive Manufacturing of Single Crystals: *Jacob Miller*[1]; Michael Maughan[1]; [1]University of Idaho

9:20 AM
Developing Processing Parameters for Epitaxial Growth in Single Crystal CMSX-4 Single Beads via Laser Powder Bed Fusion: *Amir Mostafaei*[1]; Joseph Pauza[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

9:40 AM
LPBF Production of Inconel 939: Powder Evaluation & Process Parameters Investigation: *Simone Parizia*[1]; Giulio Marchese[1]; Abdollah Saboori[1]; Mariangela Lombardi[1]; Paolo Fino[1]; Diego Manfredi[2]; Sara Biamino[1]; [1]Politecnico di Torino; [2]Istituto Italiano di Tecnologia

10:00 AM
High Throughput Process Mapping of Metal Additive Manufacturing Applied to Austenitic Stainless Steel and Ni-based Superalloys: *Ankur Kumar Agrawal*[1]; Gabriel Meric De Bellefon[1]; Dan Thoma[1]; [1]University of Wisconsin-Madison

MONDAY AM

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

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

Monday AM
September 30, 2019

Room: B115
Location: Oregon Convention Center

Session Chair: Prashanth Konda Gokuldoss, Tallinn University of Technology

8:00 AM
Characterization of the Balling Defect in Stainless Steels during Laser Powder Bed Additive Manufacturing: Debomita Basu[1]; *Bryan Webler*[1]; Jack Beuth[1]; [1]Carnegie Mellon University

8:20 AM
Concurrent Chemical and Structural Microanalysis of 316L Stainless Steel Parts Built with Closed Lifecycle Additive-subtractive Manufacturing: *Justin Morrow*[1]; Marcus Jackson[2]; John Konopka[1]; Dan Thoma[3]; Frank Pfefferkorn[2]; [1]Thermo Fisher Scientific; [2]University of Wisconsin-Madison; [3]Grainger Institute for Engineering

8:40 AM
On the Contribution of Defects on Small-scale Mechanical Properties of Additive Manufactured Stainless Steel 316: *Mahmoud Baniasadi*[1]; Nicholas Sutton[1]; Meysam Haghshenas[2]; [1]Georgia Southern University; [2]University of North Dakota

9:00 AM
On the Thermal Stability of the Cellular Microstructure of Additively Manufactured Stainless Steel 316L: *Janith Wanni*[1]; Andrew Birnbaum[2]; John Michopoulos[2]; Amit Bagchi[2]; Ajit Achuthan[1]; [1]Clarkson University; [2]U.S. Naval Research Laboratory

9:20 AM
Modeling and Characterization of as-built Microstructure of SLM-processed 17-4PH Stainless Steel: *Abhinav Saboo*[1]; Swathi Vunnam[2]; Dana Frankel[1]; Thomas Starr[2]; [1]QuesTek Innovations LLC; [2]University of Louisville

9:40 AM
The Effect of Microstructural Features on the Local Stress Field in Additively Manufactured 17-4 Steel: *Ajit Achuthan*[1]; Robert Saunders[2]; John Michopoulos[2]; Amit Bagchi[2]; [1]Clarkson University; [2]US Naval Research Laboratory

10:00 AM Break

10:20 AM
Microstructures and Properties of Tool Steels Produced by Laser Powder Bed Fusion: Yining He[1]; Jack Beuth[1]; *Bryan Webler*[1]; [1]Carnegie Mellon University

10:40 AM
Correlation between Processing Parameters and Mechanical Properties of Additive Manufactured H13 Steel: *Piter Gargarella*[1]; Adriel de Oliveira[2]; Luiz Henrique de Lima[1]; Bianca Caroline Felipe[1]; Claudemiro Bolfarini[1]; Nelson de Alcântara[1]; [1]Materials Engineering Department, Federal University of São Carlos; [2]Posgraduate Program in Materials Science and Engineering, University of São Carlos

11:00 AM
Additive Manufacturing of Duplex Stainless Steel via Selective Laser Melting and Subsequent Heat Treatment: *Gregory Nigon*[1]; Somayeh Pasebani[1]; Burkan Isgor[1]; [1]Oregon State University

Additive Manufacturing: Effective Production, Characterization, and Recycling of Powder Materials — Production and Recycling

Program Organizers: James Paramore, U.S. Army Research Laboratory; Ulf Ackelid, Freemelt AB; Sudarsanam Babu, University of Tennessee, Knoxville; Brady Butler, U.S. Army Research Laboratory; Zhigang Fang, University of Utah; Ola Harrysson, North Carolina State University; Don Li, Arconic Titanium & Engineered Products; Andrzej Wojcieszynski, ATI Specialty Materials

Monday AM
September 30, 2019

Room: B116
Location: Oregon Convention Center

Session Chairs: James Paramore, United States Army Research Laboratory; Brady Butler, United States Army Research Laboratory

8:00 AM Keynote
Hydrogen Assisted Magnesiothermic Reduction (HAMR) for Making Low-oxygen Ti Powder: *Pei Sun*[1]; Z. Zak Fang[1]; Ying Zhang[1]; Yang Xia[1]; Hyrum Lefler[1]; Tuoyang Zhang[1]; [1]University of Utah

8:30 AM
Effects of Recycling PREP and Plasma Atomized Ti-6Al-4V Powder from LENS Process: *Courtney Morgan-Barnes*[1]; Ryan Stokes[1]; Joseph Young[1]; Linkan Bian[1]; Matthew Priddy[1]; Haley Doude[1]; Jacob Easley[1]; [1]Mississippi State University

8:50 AM
Characterization of Titanium Powder Produced from Battlefield Scrap for Additive Manufacturing: *Christopher Massar*[1]; [1]Worcester Polytechnic Institute

9:10 AM Invited
Exploring the Feasibility of Cryomilled Aluminum Alloy 5083 as Feed Stock Material for Additive Manufacturing: *Franklyn Kellogg*[1]; Andelle Kudzal[2]; Ryan Rogers[3]; Brandon McWilliams[2]; [1]SURVICE Engineering; [2]US Army Research Laboratory; [3]Bowhead Science and Technology

9:40 AM
Additive Manufacturing Alloys: Influence of Powder Preparation Method in Aluminum Matrix Composites: *Jakob Hamilton*[1]; Ola Harrysson[2]; Christopher Rock[2]; Iris Rivero[1]; [1]Rochester Institute of Technology; [2]North Carolina State University

10:00 AM Break

10:20 AM
Assessment of 316L Stainless Steel Powder Produced from Recycled Machining Chips for Closed Lifecycle Additive-Subtractive Manufacturing: *Marcus Jackson*[1]; Justin Morrow[2]; John Konopka[2]; Dan Thoma[3]; Frank Pfefferkorn[1]; [1]University of Wisconsin-Madison; [2]Thermo Fisher Scientific; [3]Grainger Institute for Engineering

10:40 AM
Metal Particulate Produced by Modulation-assisted Machining: Indrani Biswas[1]; Stiven Puentes[1]; James Mann[2]; Srinivasan Chandrasekar[1]; *Kevin Trumble*[1]; [1]Purdue University; [2]University of West Florida

Additive Manufacturing: In-situ Process Monitoring and Control — Imaging Methods

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

Monday AM
September 30, 2019

Room: B112
Location: Oregon Convention Center

Session Chair: Ulf Ackelid, Freemelt AB

8:00 AM
High-speed Video Monitoring of Stochastic PBFAM Flaw Formation: David Corbin[1]; *Abdalla Nassar*[1]; Edward Reutzel[1]; Michael Krane[1]; Ryan Overdorff[2]; [1]Applied Research Laboratory; [2]3D Systems

8:20 AM
Enabling Thermal Signature Mapping in AM Parts Using Infrared Imaging: *Sujana Chandrasekar*[1]; Jamie Coble[1]; Fred List[2]; James Carver[2]; Caitlin Hensley[1]; Travis Mcfalls[3]; Vincent Paquit[2]; Ryan Dehoff[2]; Sudarsanam Babu[1]; [1]University of Tennessee, Knoxville; [2]Oakridge National Laboratory; [3]BWXT Technologies

8:40 AM
Feedback Control of Scanning Laser Epitaxy (SLE) – Estimation of Melt Pool Temperature and Size: *Amrita Basak*[1]; Rohan Bansal[2]; Suman Das[2]; [1]Pennsylvania State University; [2]Georgia Institute of Technology

9:00 AM Invited
In Situ Detection and Tracking of Spatter in Laser Powder Bed Fusion: Christopher Barrett[1]; Evan Harris[1]; Carolyn Carradero-Santiago[1]; Jeremy McKnight[1]; Eric MacDonald[1]; *Brett Conner*[1]; [1]Youngstown State University

9:40 AM
Identification of Powder Layer Defects in Additive Manufacturing via Digital Image Correlation: *Jamison Bartlett*[1]; Xiaodong Li[1]; [1]University of Virginia

10:00 AM Break

10:20 AM
Oxygen and Moisture Effects on Particle-melt Pool Wetting Characterized via In-situ High Speed Imaging in Laser Directed Energy Deposition: *James Haley*[1]; Enrique Lavernia[2]; Julie Schoenung[2]; Ryan Dehoff[1]; [1]Oak Ridge National Laboratory; [2]University of California, Irvine

10:40 AM
Process Monitoring and Control Using Electron Signals in the EBM Process: *Mouda Tung*[1]; Chris Ledford[1]; Timothy Horn[1]; [1]North Carolina State University, Center for Additive Manufacturing and Logistics

11:00 AM
Real Time Observation of Binder Jetting Printing Process Using High-speed X-ray Imaging: *Niranjan Parab*[1]; Cang Zhao[1]; Ross Cunningham[1,2]; Kamel Fezzaa[1]; John Barnes[3]; Anthony Rollett[2]; Tao Sun[1]; [1]Argonne National Laboratory; [2]Carnegie Mellon University; [3]The Barnes Group Advisors

11:20 AM
In Situ Observation of Crack Mitigation Effects of Alloy Additives in Tungsten: *Bey Vrancken*[1]; Rishi Ganeriwala[1]; Wayne King[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory

Additive Manufacturing: Solid-state and Other Nonbeam-based Technologies for the Manufacturing of Metallic Parts — AM by Friction Stir Welding and Cold Spray Methods

Program Organizers: Olaf Andersen, Fraunhofer Society; J. Brian Jordon, University of Alabama; Orlando Rios, Oak Ridge National Laboratory; Paul Allison, University of Alabama; Mark Norfolk, Fabrisonic LLC; Luke Brewer, University of Alabama

Monday AM
September 30, 2019

Room: B114
Location: Oregon Convention Center

Session Chair: Olaf Andersen, Fraunhofer Society

8:00 AM Introductory Comments

8:10 AM
SLS Production Friction Stir Plugs by Solid State Additive Deposition: *Kathryn Anderson*[1]; Paul Allison[1]; Robert Amaro[2]; [1]The University of Alabama; [2]Southern Research

8:30 AM
Smoothed Particle Hydrodynamics Simulation of Additive Friction Stir Manufacturing of Aluminum Alloy 6061: *George Stubblefield*[1]; Kirk Fraser[2]; Paul Allison[1]; Brian Jordon[1]; [1]University of Alabama; [2]National Research Council Canada

8:50 AM
Microstructure and Mechanical Properties of Solid-state Additive Friction Stir Processed Alloy 600 on 304L Stainless Steel: Biswajit Dalai[1]; Jie Song[2]; Syeda Sumaiya[2]; Benjamin Sutton[3]; Nicholas Mohr[3]; Young-Sik Pyun[4]; Seetha Mannava[2]; Matthew Steiner[2]; *Vijay Vasudevan*[2]; [1]Lulea University of Technology; [2]University of Cincinnati; [3]Electric Power Research Institute; [4]Sun Moon University

9:10 AM
Advances in Processing and Microstructure Control in Additive Friction Stir Deposition: *Joey Griffiths*[1]; Hang Yu[1]; [1]Virginia Polytechnic Institute

9:30 AM
Microstructural-mechanical Property Relationship of Additive Friction Stir-deposition Al-Mg1-Si-Cu: *Brandon Phillips*[1]; Dustin Avery[1]; Tao Liu[1]; Omar Rodriguez[2]; C.J.T. Mason[1]; J. B. Jordon[1]; Luke Brewer[1]; Paul Allison[1]; [1]University of Alabama; [2]NASA Marshall Space Flight Center

9:50 AM
Analysis of Metallic Feedstock Powder for Solid-state Additive Manufacturing: *Kyle Tsaknopoulos*[1]; Victor Champagne[2]; Danielle Cote[1]; [1]Worcester Polytechnic Institute; [2]Army Research Lab

10:10 AM Break

10:30 AM
Cold Spray of Metallic Particles: The Effects of Surface Oxide Layer: *Vahid Rahneshin*[1]; Arvand Navabi[1]; Trevor Bond[1]; Adebayo Badmos[1]; Nima Rahbar[1]; Winston Soboyejo[1]; [1]Worcester Polytechnic Institute

10:50 AM
Influence of Impacting Particle Size and Stacking Fault Energy on Ag Films Deposited by High Velocity Aerosol Deposition: *Jeremiah Mccallister*[1]; Michael Becker[1]; John Keto[1]; Desiderio Kovar[1]; [1]The University of Texas at Austin

11:10 AM
Laser Assisted Cold Spray Deposition of 4340 Steel: *Luke Brewer*[1]; Dallin Barton[1]; Venkata Bhattiprolu[1]; Gregory Thompson[1]; [1]University of Alabama

11:30 AM
Microstructural and Mechanical Properties of Solid-state Additively Manufactured Aluminum Metal Matrix Composite: *Taylor Mason*[1]; Rogie Rodriguez[2]; Brandon Phillips[1]; Dustin Avery[1]; Brady Williams[1]; Paul Allison[1]; Brian Jordon[1]; [1]The University of Alabama; [2]Boeing Research and Technology

Advanced Biomaterials for Biomedical Implants and Biosensing Devices — Session I

Program Organizers: Tolou Shokuhfar, University of Illinois at Chicago; Sahar Vahabzadeh, Northern Illinois University

Monday AM
September 30, 2019

Room: C120
Location: Oregon Convention Center

Session Chairs: Tolou Shokuhfar, University of Illinois at Chicago; Sahar Vahabzadeh, Northern Illinois University

8:00 AM Invited
Carbon Nanostructures for Neuroregeneration: Potential and Challenges: *Fariborz Tavangarian*[1]; [1]Pennsylvania State University, Harrisburg

8:30 AM
A Synergistic Effect of Proteins and Inorganic Ions on the Degradation of Absorbable Zn, and Zn-Ag-based Biomaterials: *Malgorzata Sikora-Jasinska*[1]; Ehsan Mostaed[1]; Jaroslaw W. Drelich[1]; [1]Michigan Technological University

8:50 AM
Electrochemical Studies of Titanium Alloys for Dental Implants: *Jaewan Bae*[1]; Jacob Benoun[1]; Vilupanur Ravi[1]; [1]Cal Poly Pomona

9:10 AM
Iron Effects on Physical, Mechanical and Biological Properties of Brushite Cement: *Sahar Vahabzadeh*[1]; Sarah Fleck[1]; Joshua Marble[1]; [1]Northern Illinois University

9:30 AM
Magnesium Alloy as Body Implant: Stress Corrosion Cracking Behaviour under Heat Treated Condition in Physiological Environment: *Shashikant Vagge*[1]; [1]College of Engineering Pune

9:50 AM
Ti Based Superelastic Scaffolds Prepared by Fiber Sintering: *Taehyun Nam*[1]; Shuanglei Li[1]; [1]Gyeongsang National University

10:10 AM Break

10:30 AM
Mg-Zn-Sr Alloy based Interference Screw Developed for ACL Reconstruction: *Huafang Li*[1]; [1]University of Science and Technology Beijing

10:50 AM
Modification of Low Modulus Titanium Alloys by Addition of Interstitial Solute for Biomedical Load Bearing Applications: *Madhusudan Chakraborty*[1]; Pallab Majumdar[2]; [1]Adamas University; [2]IIT Kharagpur

11:10 AM
Production of Biodegradable Mg and Mg-0.4Zn Wires Intended for Sternal Fixation in Pediatric Patients: *Karel Tesar*[1]; Pavel Klein[2]; Elena Filova[3]; Zbynek Sucharda[4]; Karel Balik[4]; [1]Czech Technical University in Prague; [2]Charles University; [3]Institute of Physiology of the Czech Academy of Sciences; [4]The Institute of Rock Structure and Mechanics of the Czech Academy of Sciences

11:30 AM
The Effects of Alloy Purity and Surface Finish on Corrosion Susceptibility of Nitinol Heart Valves: *Grazziela Sena*[1]; Alan Pelton[2]; Chris Braeuner[3]; Matthew Di Prima[4]; Philip Strafford[4]; Srinidhi Nagaraja[2]; Vilupanur Ravi[1]; [1]California State Polytechnic University, Pomona; [2]G. Rau Inc.; [3]ADMEDES GmbH; [4]US Food and Drug Administration

Advanced High Strength Steels / From Design to End Users — Steel Design

Program Organizers: Alla Sergueeva, NanoSteel Company Inc.; Daniel Branagan, The NanoSteel Company

Monday AM
September 30, 2019

Room: C124
Location: Oregon Convention Center

Session Chairs: Gary Cola, Flash Steelworks; Christian Klinkenberg, SMS group

8:00 AM
Effect of Ni Content on Impact Toughness in Tempered Matensitic Steels: *Shigeki Kitsuya*[1]; Katsuyuki Ichimiya[1]; Kazukuni Hase[1]; [1]JFE Steel Corporation

8:20 AM
Effect of Yttrium-based Rare Earth on the Microstructure and Impact Toughness of E36 Shipbuilding Steel: *Maolin Ye*[1]; Xiaojun Xi[1]; Shufeng Yang[1]; Jingshe Li[1]; [1]University of Science and Technology Beijing

8:40 AM
Hydrogen Uptake and Its Effect on Mechanical and Fracture Behavior of Ultra-high Strength Press-hardened Steels: *Lawrence Cho*[1]; Peter E. Bradley[1]; Matthew J. Connolly[1]; May L. Martin[1]; Damian S. Lauria[1]; Frank DelRio[1]; Kyoung Rea Jo[2]; Eun Jung Seo[3]; Andrew J. Slifka[1]; [1]National Institute of Standards and Technology, Boulder; [2]Graduate Institute of Ferrous Technology, Pohang University of Science and Technology; [3]Advanced Steel Processing and Products Research Center (ASPPRC), Colorado School of Mines

9:00 AM
Correlation between EBSD Quantification and Dilatometry Examination of an X70 Steel: *Anthony Roccisano*[1]; Shahrooz Nafisi[2]; Reza Ghomashchi[1]; [1]The University of Adelaide; [2]The University of Adelaide, University of Alberta, Consolidated Metco

9:20 AM
Evolution of Microstructure and Mechanical Properties during Conventional and Ultra-fast Heating of a Low Carbon Steel: The Effect of Soaking Time: Miguel Valdés-Tabernero[1]; Florian Vercruysse[2]; Miguel Monclús[1]; Jon Molina-Aldareguia[1]; Roumen Petrov[2]; *Ilchat Sabirov*[1]; [1]IMDEA Materials Institute; [2]Ghent University

9:40 AM
Effect of Strain Rate on the Columnar to Equiaxed Transition in an As-cast Medium Carbon Low Alloy Steel during Hot Deformation: *Kanwal Chadha*[1]; Mohammad Jahazi[2]; John Spray[1]; [1]University of New Brunswick; [2]Ecole de Technology Superiour

10:00 AM Break

10:15 AM
Steel-copper Nano Composited Materials: Volodymyr Tsyganov[1]; Valery Naumik[1]; Harold Byalik[1]; Leonid Ivschenko[1]; *Richard Mokhnach*[1]; [1]Zaporizhy National Technical University

10:35 AM
Research and Application of Heating Agent for 2.3 Ton Ingots: *Tongjun Zhou*[1]; Junzhan Liu[1]; [1]Baowu Group

Advanced Materials for Harsh Environments — Session I

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

Monday AM
September 30, 2019

Room: C126
Location: Oregon Convention Center

Session Chairs: Gurbinder Kaur; Gary Pickrell, Virginia Tech; Navin Manjooran, Solve Technology and Research, Inc.

8:00 AM Keynote
Materials Under Extreme Environments at the Atomic Scale: *Susan Sinnott*[1]; [1]Pennsylvania State University

8:40 AM Invited
Alloy Design and Process Development for Direct Shape Forming of Fe-based ODS Alloys with Oxidation Resistance by Cold Spray Deposition: *Iver Anderson*[1]; Rebecca Whitesell[1]; Emma White[1]; Timothy Prost[1]; Stuart Maloy[2]; Timothy Eden[3]; Todd Palmer[3]; [1]Iowa State University / Ames Laboratory; [2]Los Alamos National Laboratory; [3]Pennsylvania State University

9:00 AM
Alloy Coatings by Electrodeposition for Improved Corrosion Resistance: *Timothy Hall*[1]; Jing Xu[1]; Santosh Vijapur[1]; Jennings Taylor[1]; Maria Inman[1]; Rajeswaran Radhakrishnan[1]; Stephen Snyder[1]; [1]Faraday Technology, Inc.

9:20 AM
Adsorption and Corrosion Inhibition Effect of Ammonium Molybdate Tetrahydrate on Mild Steel in 1M of HCl: *Ojo Sunday Fayomi*[1]; [1]Covenant University

9:40 AM
Corrosion Assessment and Materials Selection for The Construction of Flue Gas Core Components at Advanced Pressurized Oxy-fuel Combustion Plants: *Yimin Zeng*[1]; Kaiyang Li[2]; Jing-li Luo[2]; [1]NRCan, Canada; [2]University of Alberta

10:00 AM Break

10:20 AM
Development of a Diamond Containing Material for Drilling in UltraHard Formations: *Jianhui Xu*[1]; Weicheng Li[2]; Xu Wang[1]; Jianlin Yao[2]; Chris Cheng[1]; Yonghong Wang[1]; Xiongwen Yang[1]; [1]CNPC USA, CNPC; [2]Chuanqing Drilling Engineering Company, CNPC

10:40 AM
High Temperature Corrosion of Iron Alloys for Direct Fired sCO_2 Power Cycle Applications: *Joseph Tylczak*[1]; Gordon Holcomb[1]; Richard Oleksak[2]; Ömer Dogan[1]; [1]National Energy Technology Laboratory; [2]National Energy Technology Laboratory, Leidos Rsearch Support Team

11:00 AM
Corrosion Behavior of Iron and Nickel Based Alloys in Superheater Tube Environments: *Kasey Hanson*[1]; Preet Singh[1]; [1]Georgia Tech

11:20 AM Concluding Comments

Advances in Dielectric Materials and Electronic Devices — Dielectrics and Piezoelectrics: Session I Modeling and Related

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

Monday AM
September 30, 2019

Room: A105
Location: Oregon Convention Center

Session Chairs: Vojislav Mitic, University Nis; Ivair Santos, State University of Maringá

8:00 AM Invited
Using First Principles Methods to Understand and Optimize the Properties of Microwave Ceramic Dielectrics: *Nathan Newman*[1]; Justin Gonzales[1]; Christopher Muhich[1]; [1]Arizona State University

8:20 AM Invited
The Fractals Microelectronics Frontiers and Graphs Theory Applications: *Vojislav Mitic*[1]; Goran Lazovic[2]; Branislav Randjelovic[3]; Vesna Paunovic[3]; Jyh Ming Wu[4]; Dragan Mancic[3]; Jih Ru Hwu[4]; Branislav Vlahovic[5]; [1]University Nis, Fac. Electronic Engineering, ITS. S.A.S.A,; [2]Faculty of Mechanical Engineering University of Belgrade; [3]Faculty of Electronic Engineering University Nis; [4]National Tsing Hua University; [5]NCCU

8:40 AM
Phase Stability of Tetragonal BiFeO3 and Bi(Fe,Cr)O3 Heterostructures by Density-functional Theory: *Michael Walden*[1]; Cristian Ciobanu[1]; Geoff Brennecka[1]; [1]Colorado School of Mines

9:00 AM
Electronic Structure and Optical Properties of La-doped KSr2Nb5O15: A First-principles Investigation: *Qian Chen*[1]; Jie Xu[1]; Shuyao Cao[1]; Yiting Guo[1]; Feng Gao[1]; Guanghua Cheng[2]; [1]Northwestern Polytechnical University; [2]Xi'an Institute of Optics and Precision Mechanics of Chinese Academy of Sciences

9:20 AM
Impact of Structure on Polarization Reversal in Polycrystalline Ferroelectric/Ferroelastic Ceramics: *Jan Schultheiß*[1]; Jurij Koruza[1]; [1]TU Darmstadt

9:40 AM
Empirical Modeling of Cation Ordering in Perovskite Ceramics: *Evan Smith*[1]; Rick Ubic[1]; [1]Boise State University

10:00 AM Break

10:20 AM Invited
NSMM Modeling and Design of Dielectric Materials: Shannon Rogers[1]; Keith Rekczis[1]; *Steven Tidrow*[1]; [1]Alfred University

10:40 AM
Numerical Optimization and Experimental Characterization of Stacked 1:3 Piezoelectric Composites for Energy Harvesting: *Bryan Gamboa*[1]; Amar Bhalla[1]; Ruyan Guo[1]; [1]University of Texas, San Antonio

11:00 AM Invited
PLD Growth of STO Thin Films on Graphene Oxide-buffered Si (001) Surface: *Zoran Jovanovic*[1]; Urška Gabor[1]; Elena Tchernychova[2]; Matejka Podlogar[1]; Danilo Suvorov[1]; Matjaž Spreitzer[1]; [1]Jozef Stefan Institute; [2]National Institute of Chemistry

11:20 AM Invited
Ultra-low Temperature Co-fired Ceramics (ULTCC) –A Review on Current Compositions Introduced: *Heli Jantunen*[1]; [1]Oulu University

11:40 AM Invited
Effect of the Nb+5 Doping on the Physical Properties of $BaTiO_3$ Electroceramics: Marco Aurélio de Oliveira[1]; Jean-Claude M'Peko[2]; Antonio Carlos Hernandes[2]; Ruyan Guo[3]; Amar Bhalla[3]; *Jose de los Santos Guerra*[1]; [1]Universidade Federal de Uberlandia; [2]Universidade de São Paulo; [3]The University of Texas at San Antonio

Advances in Surface Engineering — Session I

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

Monday AM
September 30, 2019

Room: D137
Location: Oregon Convention Center

Session Chair: Brian Skinn, Faraday Technology, Inc.

8:00 AM
Method of Thermal Spray Coating Fiber-reinforced Composite Materials: *Irina Downs*[1]; Daryl Crawmer[1]; Raymond Meuer[1]; Jim Watts[1]; [1]Fisher Barton Technology Center

8:20 AM
Fabrication and Analysis of Biomimetic Micro-patterned Ionic Polymer-metal Composite (IPMC) Thin-film Actuators: *Allison Arnold*[1]; Kavin Sivaneri Varadharajan Idhaiam[1]; Kevin Tennant[1]; Laura Leyzorek[1]; Edward Sabolsky[1]; Ji Su[1]; [1]West Virginia University

8:40 AM
Extreme Modification of Surface Wettability by Nanosecond Laser Treatment: Pablo Pou[1]; Jesús del Val[1]; *Antonio Riveiro*[1]; Rafael Comesaña[1]; Felipe Arias-González[1]; Fernando Lusquiños[1]; Aida Badaoui[1]; Juan Pou[1]; [1]University of Vigo

9:00 AM
A Comparative Study of the Effects of Surface Treatments and Finishes on the High Temperature Oxidation Behavior of Alloy 800 in a 400 °C Steam Environment: *Richard Chiang*[1]; Sebastien Teysseyre[2]; Jeffery Aguiar[3]; Geogy Abraham[4]; Vivekanand Kain[4]; Vijay Vasudevan[1]; [1]University of Cincinnati; [2]Canadian Nuclear Laboratories; [3]Idaho National Laboratory; [4]Bhabha Atomic Research Centre

9:20 AM
Nanostructured Aluminum Decoration of Multi-walled Carbon Nanotubes (MWCNTs): *Mohammed Elsharkawi*[1]; Amal Esawi[1]; [1]The American University In Cairo

9:40 AM
Development of Multifunctional Coatings via Anodizing: *Enkeleda Dervishi*[1]; Randall Edwards[1]; Moraya Gutierrez[1]; Nan Li[1]; Raven Buntyn[1]; Jamie Stull[1]; Don Johnson[1]; Dan Hooks[1]; [1]Los Alamos National Laboratory

10:00 AM Break

10:20 AM
Determination of Bonding Strength of Cold Sprayed Splats Using In-situ Nano-scratch Technique: *Cheng Zhang*[1]; Pranjal Nautiyal[1]; Benjamin Boesl[1]; Arvind Agarwal[1]; [1]Florida International University

10:40 AM
Design on Interpretable Convolutional Neural Networks for Surface Roughness Analysis: *Christopher Kantzos*[1]; Jacky Lao[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

11:00 AM
Atomistic Origins of Temperature-dependent Shear Strength in 2D Materials: *Adam Hinkle*[1]; John Curry[1]; Tomas Babuska[1]; Mark Wilson[1]; Michael Dugger[1]; Brandon Krick[2]; Nicolas Argibay[1]; Michael Chandross[1]; [1]Sandia National Laboratories; [2]Lehigh University

11:20 AM
Advances in Plasma Thermochemical Treatment: *Fuyao Yan*[1]; Mufu Yan[1]; Ruiliang Liu[1]; Yang Yang[1]; Yanxiang Zhang[1]; [1]Harbin Institute of Technology

Alumina at the Forefront of Technology III — Alumina at the Forefront of Technology III

Program Organizers: William Walker, Federal-Mogul; Charles Compson, Almatis; William Carty, Alfred University; Marina Pascucci, CeraNova

Monday AM
September 30, 2019

Room: A104
Location: Oregon Convention Center

Session Chair: William Walker, Federal-Mogul Powertrain

8:20 AM
Advances in Additive Manufacturing of High Strength Alumina and Alumina-derived Ceramics: *Shawn Allan*[1]; Nicole Ross[1]; Martin Schwentenwein[2]; [1]Lithoz America, LLC; [2]Lithoz GmbH

8:40 AM Invited
Ribbon Ceramics: *Patrick Tepesch*[1]; John Olenick[2]; [1]Corning Incorporated; [2]ENrG Incorporated

9:10 AM Invited
Corrosion Stability of Alumina in Water: *William Carty*[1]; Hyojin Lee[1]; Paul Ormond[2]; [1]Alfred University; [2]AluChem

9:40 AM
Investigating the Dependence of Microstructure Evolution during Liquid Phase Sintering on Grain Boundary Chemistry in Al_2O_3: *Sarah Whipkey*[1]; William Carty[1]; [1]Alfred University

10:00 AM Break

10:20 AM Invited
Grain Boundary Complexion Engineering: Lessons Learned in Alumina: *Amanda Krause*[1]; [1]University of Florida

10:50 AM
Investigating the Grain Growth Kinetics of Al_2O_3 During Liquid Phase Sintering in the CaO-Al_2O_3-SiO_2 System: *Sarah Whipkey*[1]; William Carty[1]; [1]Alfred University

11:10 AM
From Micro to Macro: Crack Evolution in Alumina under Compressive Loading: *Tomoko Sano*[1]; Brendan Koch[2]; Calvin Lo[2]; Haoyang Li[2]; James Hogan[2]; [1]US Army Research Laboratory; [2]University of Alberta

11:30 AM
Alumina Ceramics at Elevated Temperatures: *William Walker*[1]; [1]Federal-Mogul

Ceramic and Crystal Materials for Optics and Photonics — Session I

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Mark Dubinskiy, Army Research Laboratory; Randall Hay, U.S. Air Force Research Laboratory; Xiang-Hua Zhang, Université de Rennes 1; Michael Squillante, RMD, Inc; Long Zhang, Chinese Academy of Sciences; Takunori Taira, National Institutes of Natural Science

Monday AM
September 30, 2019

Room: A107
Location: Oregon Convention Center

Session Chairs: Victoria Blair, Army Research Laboratory; Yiquan Wu, Alfred University

8:00 AM Invited
Additive Manufacturing of Transparent Ceramics: *Zachary Seeley*[1]; Timothy Yee[1]; Nerine Cherepy[1]; Stephen Payne[1]; [1]Lawrence Livermore National Laboratory

8:40 AM Invited
Strategies to Strengthen Ceramics for Windows and Domes: *Ivar Reimanis*[1]; [1]Colorado School of Mines

9:20 AM Invited
Sulfide Ceramics for Optics and Photonics: *Odile Merdrignac-Conanec*[1]; Guillaume Durand[1]; Noha Hakmeh[1]; Renguang Ye[2]; Xiang-Hua Zhang[1]; [1]University of Rennes 1-UMR CNRS 6226-ISCR; [2]China Jiliang University-UMR CNRS 6226-ISCR

9:40 AM Invited
A Comparison of Rare Earth Dopants in a Nanocomposite Material System for Infrared Laser Gain Media: *Victoria Blair*[1]; Steven Kilczewski[1]; Zackery Fleischman[1]; [1]Army Research Laboratory

10:00 AM Break

10:20 AM Invited
Fabrication Processes for Transparent Polycrystalline YAG, LuAG, and ZnO: *Hyunjun Kim*[1]; Randall Hay[2]; Shekhar Guha[2]; Alan Martinez[1]; Randall Corns[1]; Samuel Opeka[1]; Michael Cinibulk[2]; [1]AFRL/UES, Inc.; [2]AFRL

10:40 AM Invited
Fabrication of Novel Laser Optics by Spark Plasma Sintering Technique: *Hiroaki Furuse*[1]; [1]Kitami Institute of Technology

11:00 AM Invited
Transparent $MgAl_2O_4$ Spinel Ceramics with Enhanced Strength via Suppressing the Grain Growth: *Ha-Neul Kim*[1]; Ji-Won Kim[1]; Jae-Woong Ko[1]; Young-Jo Park[1]; Jon-Do Yun[2]; Young-Chul Kim[3]; Ki-Deok Yang[3]; [1]Korea Institute of Materials Science; [2]Kyungnam University; [3]Finetech

11:20 AM Invited
Transparent Ceramics for Laser and Optical Applications: *Benxue Jiang*[1]; [1]Shanghai Institute of Optics and Fine Mechanics

Ceramics and Glasses Simulations and Machine Learning — Machine Learning and Materials Informatics

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas; Efrain Hernandez, Army Research Laboratory

Monday AM
September 30, 2019

Room: A109
Location: Oregon Convention Center

Session Chair: Peter Kroll, University of Texas Arlington

8:00 AM Invited
Embedding Machine Learning in the Physics of Disordered Solids: *Ekin Cubuk*[1]; [1]Google Brain

8:40 AM
Machine Learning Applied to Zeolite Synthesis Enabled by Automatic Literature Data Extraction: *Zach Jensen*[1]; Elsa Olivetti[1]; [1]Massachusetts Institute of Technology

9:00 AM
Machine Learning-aided Development of Empirical Force-fields for Glassy Materials: Han Liu[1]; *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

9:20 AM
Utilization of Artificial Neural Network to Explore the Compositional Space of Hollandite-structured Materials for Cs Incorporation: *Dipta Ghosh*[1]; Bijaya Karki[1]; Jianwei Wang[1]; [1]Lousiana State University

9:40 AM
Physics-Based Machine Learning Models for High Throughput Screening of Novel Scintillator Chemistries: *Blas Uberuaga*[1]; Ghanshyam Pilania[1]; Christopher Stanek[1]; Kenneth McClellan[1]; [1]Los Alamos National Laboratory

10:00 AM Break

10:20 AM
Machine Learning to Predict the Elastic Properties of Glasses: *N. M. Anoop Krishnan*[1]; Nishank Goyal[1]; Divyarth Saxena[1]; Sourabh Singh[1]; Suresh Bishnoi[1]; Ravinder Ravinder[1]; Hariprasad Kodamana[1]; [1]Indian Institute of Technology

10:40 AM
Exploring Molecular Dynamics Descriptors to Improve Machine Learning Predictions of Glass Forming Ability: *Benjamin Afflerbach*[1]; Lane Schultz[1]; Izabela Szlufarska[1]; Dane Morgan[1]; [1]University of Wisconsin-Madison

11:00 AM
Leveraging Machine Learning to Predict Microstructural and Macroscopic Properties of Alumina: *Russell Gleason*[1]; Branden Kappes[1]; Geoff Brennecka[1]; Aaron Stebner[1]; [1]Colorado School of Mines

11:20 AM
Machine Learning and Energy Minimization Approaches for Crystal Structure Predictions: A Review and New Horizons: *Jake Graser*[1]; Steven Kauwe[1]; Taylor Sparks[1]; [1]University of Utah

11:40 AM
Prediction of Compressive Strength and Modulus of Elasticity of Concrete Using Machine Learning Models: *Taihao Han*[1]; Aditya Kumar[1]; [1]Missouri University of Science and Technology

Characterization and Modeling of Metal Whisker Formation — Sn Whisker Formation

Program Organizers: Philip Eisenlohr, Michigan State University; Eric Chason, Brown University; Carol Handwerker, Purdue University

Monday AM
September 30, 2019

Room: E142
Location: Oregon Convention Center

Session Chair: Carol Handwerker, Purdue University

8:00 AM
Formation and Evolution of Tin Surface Defects Using Cyclic Mechanical Loading: *Xi Chen*[1]; [1]Purdue University

8:20 AM
Nucleation of Whisker Grains at Grain Boundaries in Sn Films at Early Stage of Thermal Cycling: *Congying Wang*[1]; John Blendell[1]; Carol Handwerker[1]; [1]Purdue University

8:40 AM Invited
Pressure Induced Whisker Growth in Sn Coatings: *Piyush Jagtap*[1]; Nupur Jain[1]; Eric Chason[1]; [1]Brown University

9:10 AM
The Effects of Bismuth on Tin Whisker Growth after High Temperature, High Humidity Storage: *Andre Delhaise*[1]; Zohreh Bagheri[1]; Stephan Meschter[2]; Jeffrey Kennedy[1]; Polina Snugovsky[1]; [1]Celestica; [2]BAE Systems

9:30 AM Invited
Understanding Driving Forces and Mechanisms of Tin Whiskers on Thermally Strained Films Using Multi-physics Simulations: Aritra Chakraborty[1]; Pratheek Shanthraj[2]; *Philip Eisenlohr*[1]; [1]Michigan State University; [2]University of Manchester

Characterization of Materials and Properties through Metallography, Mechanical Testing and Analysis - From Fundamentals to the Cutting Edge — Metallographic Preparation Techniques from Fundamentals to Novel Solutions

Program Organizer: Michael Keeble, Buehler

Monday AM
September 30, 2019

Room: F152
Location: Oregon Convention Center

Session Chairs: Burak Akyuz, pH2, LLC; Larry Somrack, NSL Analytical Services, Inc; Henry Udomon, Struers Inc.

8:00 AM
Sample Preparation on Studying of Nanostructured Materials: *Ke Han*[1]; [1]Florida State University

8:20 AM
Modern Dimple Polishing for Microstructure Analysis: *Jake Jokisaari*[1]; [1]Ted Pella

8:40 AM
Mechanical TEM Sample Preparation: *Pablo Mendoza*[1]; [1]Allied High Tech

9:00 AM Invited
A Simple Quick X-Section Method for Paint/Coating Samples: *Andrew Havics*[1]; [1]PH2 LLC

9:20 AM
Metallography of Thermal Spray Coatings: Challenges and Opportunities: *Kaushal Kishore*[1]; Dheeraj Lal[1]; Manashi Adhikary[1]; Sandip Bhattacharyya[1]; [1]Tata Steel Limited

9:40 AM
Expanding Materials Characterization with Raman and TOF-SIMS Integrated with FIB-SEM: *Dean Miller*[1]; Dave Zapotok[1]; Zdenek Juracka[1]; Jon Hiller[1]; Ute Schmidt[2]; Tavis Ezell[2]; Nancy Senabulya[3]; Bobby Kerns[3]; Victor Maroni[4]; Daniel Abraham[4]; [1]Tescan USA; [2]WITec GmbH; [3]University of Michigan; [4]Argonne National Laboratory

10:00 AM Break

10:20 AM Invited
Challenges in the Metallographic Preparation and Etching of Additive Manufactured Materials: *Michael Keeble*[1]; [1]Buehler

10:40 AM
Revealing Overheating in 7175 Aluminum: *Gabriel Lucas*[1]; Brian Battle[1]; [1]Scot Forge Company

11:00 AM
Metallurgical Investigation of Tie Rod of Bottom Dispenser Bucket Used in Steel Making Process: A Critical Case Study: *Souvik Das*[1]; [1]Tata Steel

11:20 AM
Semi-muffle Box Furnace Temperature Uniformity and It's Effects on Microstructure: *Michael Connelly*[1]; [1]Connelly Consulting

11:40 AM
One Million Indents, a Hardness (and Modulus) Story: Ude Hangen[1]; Jacob Noble[2]; Bernie Becker[2]; *Douglas Stauffer*[2]; [1]Bruker Nano GMBH; [2]Bruker Nano Inc

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

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

Monday AM
September 30, 2019

Room: A108
Location: Oregon Convention Center

Session Chairs: Gregg Janowski, University of Alabama at Birmingham; Jeffrey Fergus, Auburn University; Devarajan Venugopalan, University of Wisconsin - Milwaukee; Thomas Bieler, Michigan State University

8:00 AM Introductory Comments

8:10 AM
Effect of Changes in EAC/ABET Definitions, Criterion 3, and Criterion 5: Gregg Janowski[1]; Devarajan Venugopalan[2]; *Jeffrey Fergus*[3]; [1]University of Alabama at Birmingham; [2]University of Wisconsin-Milwaukee; [3]Auburn University

8:40 AM
The Development of Effective Program Educational Objectives: *Jeffrey Fergus*[1]; [1]Auburn University

9:10 AM
Preparing for an ABET Evaluations – Common Issues: *Jeffrey Fergus*[1]; [1]Auburn University

9:40 AM
Efficient (And Easy) College Wide Processes for Outcomes Assessment: Efficiently Automate Your Outcomes Assessment, Analysis, Reporting, and Documentation Process in a Simple System: *Steven Yalisove*[1]; [1]University of Michigan

10:10 AM Break

10:30 AM Question and Answer Period: Discussion on Preparing for an EAC/ABET Visit

Data Science for Material Property Interpretation — Machine Learning with Microscopy Data

Program Organizers: Alex Belianinov, Oak Ridge National Laboratory; Ichiro Takeuchi, University of Maryland; Jeff Simmons, Wright Patterson Air Force Research Laboratory; Jason Hattrick-Simpers, National Institute of Standards and Technology

Monday AM
September 30, 2019
Room: E145
Location: Oregon Convention Center

Session Chair: Alex Belianinov, Oak Ridge National Laboratory

8:00 AM Invited
Data Science and the MGI: *James Warren*[1]; [1]National Institute of Standards and Technology

8:40 AM
Workflows for Curation and Analysis of Microstructure-Aware Materials Data: Application to Aging of U-Nb Alloys: *Robert Hackenberg*[1]; Logan Ward[2]; [1]Los Alamos National Lab; [2]University of Chicago

9:00 AM
Data Analytics for Correlative Multimodal Chemical and Functional Imaging: *Anton Ievlev*[1]; Olga Ovchinnikova[1]; [1]Oak Ridge National Laboratory

9:20 AM
Neural Networks for Processing of Low Signal-to-noise Data in Scanning Probe Microscopy: *Nikolay Borodinov*[1]; Sabine Neumayer[1]; Sergei Kalinin[1]; Olga Ovchinnikova[1]; Rama Vasudevan[1]; Stephen Jesse[1]; [1]Oak Ridge National Laboratory

9:40 AM Invited
Recent Advances in 3D Reconstruction Based on Spherical Indexing of EBSD Data: *Marc De Graef*[1]; [1]Carnegie Mellon University

10:20 AM Break

10:35 AM
Automated Defect Detection in Electron Microscopy with Machine Learning: *Dane Morgan*[1]; Mingren Shen[1]; Wei Li[2]; Kevin Field[3]; [1]University of Wisconsin, Madison; [2]Google; [3]Oak Ridge National Laboratory

10:55 AM Invited
4D STEM Data Acquisition, Analytics and Functional Material Property Extraction: Debangshu Mukherjee[1]; Suhas Somnath[1]; Alex Belianinov[1]; Stephen Jesse[1]; *Raymond Unocic*[1]; [1]Oak Ridge National Laboratory

Failure Analysis & Characterization — Tools & Techniques

Program Organizers: Andrew Havics, PH2 LLC; James Lane, Rimkus Consulting Group Inc; Burak Akyuz, Applied Technical Services Inc; Pierre Dupont, UMONS, Faculté Polytechnique de MONS (FPMs)

Monday AM
September 30, 2019
Room: F150
Location: Oregon Convention Center

Session Chairs: James Lane, Rimkus Consulting Group, Inc.; Francisco Rumiche , Pontiificia Universidad Catolica del Peru; Mark Hood, Hood Engineering; Nicholas Cherolis, Baker Engineering and Risk Consultants, Inc.

8:00 AM
Failing Well: Case Studies Focused on the Fundamentals of Successful Failure Analysis: *John Hasier*[1]; Rachel Wittman[1]; [1]Intertek

8:20 AM
Visual Examination Techniques for Failure Analysis: *David Christie*[1]; [1]IMR Test Labs

8:40 AM Invited
Creep Damage on High Energy Piping: *Erhan Ulvan*[1]; [1]Acuren Group Inc.

9:00 AM
Use of Surface Replication Systems as a Method of Non-destructive Failure Analysis: *Joel Davis*[1]; [1]Rolls-Royce Corporation

9:20 AM Invited
Fractography Assisted Wear Mechanism for Engine VSI Application: Craig Schroeder[1]; *Paul Qiao*[1]; [1]L.E. Jones Company

9:40 AM Invited
On The Use of Thermal Simulations to Explain Complex Failures Modes of Bearings within Machineries: *Pierre Dupont*[1]; [1]UMONS, Faculté Polytechnique de MONS (FPMs)

10:00 AM Break

10:20 AM
Lateral Constraint in Flat Punch Nanoindentation: *Nathan Bailey*[1]; [1]Exponent, Inc.

10:40 AM Invited
Failure Localization in Conductive Materials for Flexible Electronics: *Meredith Nevius*[1]; Andy Schultz[1]; Kevin Pollock[1]; [1]Exponent

11:00 AM
Simultaneous Topographical and Electrochemical Mapping using Scanning Ion Conductance Microscopy–scanning Electrochemical Microscopy (SICM-SECM): Gabriela Mendoza[1]; *Byong Kim*[1]; Keibock Lee[1]; [1]Park Systems

11:20 AM
Confocal Microscope Imaging of Sub-surface Damage in Glass: *David Schoen*[1]; Amy Marquardt[1]; Edward Barnard[2]; [1]Exponent, Inc; [2]Lawrence Berkeley National Laboratory

Failure Analysis: Industry Specific Failures — Aerospace

Program Organizers: Andrew Havics, PH2 LLC; James Lane, Rimkus Consulting Group Inc; Burak Akyuz, Applied Technical Services Inc; Pierre Dupont, UMONS, Faculté Polytechnique de MONS (FPMs)

Monday AM
September 30, 2019

Room: F151
Location: Oregon Convention Center

Session Chairs: Dale Alexander , Engineering Systems Incorporated; William Rossey , General Electric Aviation; William Carden , Mcswain Engineering; Matthew Fox, NTSB; Wesley Pridemore , General Electric

8:00 AM Invited
Overview of NTSB Commercial Space Investigations: *Lorenda Ward*[1]; [1]National Transportation Safety Board

8:40 AM
Investigation of a Helicopter Accident Where Cyclic Control Was Lost Due to Improper Maintenance: *Aaron Slager*[1]; [1]Bell

9:00 AM Invited
Helicopter Main Rotor Servo Disconnect Failure Due to Self-locking Nut Reuse: *Richard McSwain*[1]; William Carden[1]; Eric Van Iderstine[1]; Leah Godwin[1]; [1]McSwain Engineering, Inc.

9:20 AM
Carbide Tools in Hard Metals Machining: Matthew Carter[1]; *Urmaze Naterwalla*[1]; [1]The Boeing Company

9:40 AM
747 Main Landing Gear Fracture after Overhaul: *Joe Epperson*[1]; [1]Retired NTSB

10:00 AM Break

10:20 AM Invited
The Little Plane that Could: Failure Analysis of a Robust Turbine Engine: *Dale Alexander*[1]; Richard Baron[1]; Mark Lewis[1]; Casey Smith[1]; Pierce Umberger[1]; Ellen Wright[1]; [1]ESi

10:40 AM
Failure of Polycrystalline CT Blade Fir Trees and the Role of Carbide Morphology: *William Carden*[1]; Amy Wells[1]; Richard McSwain[1]; [1]McSwain Engineering, Inc.

11:00 AM Invited
13-8Mo Galling Induced Fatigue: *Eric Allred*[1]; [1]Collins Aerospace

11:20 AM Invited
Fan Blade Fatigue Fractures in CFM56-7B Engines: *Matthew Fox*[1]; [1]National Transportation Safety Board

11:40 AM
Failure Analysis of a Second-stage Turbine Disk Rupture: *Donald Kramer*[1]; [1]National Transportation Safety Board

Gas/Metal Reactions, Diffusion, and Phase Transformation during Heat Treatment of Steel — Gas/Metal Reactions, Diffusion, and Phase Transformation during Heat Treatment of Steel

Program Organizer: Daniel Baker, General Motors

Monday AM
September 30, 2019

Room: C123
Location: Oregon Convention Center

Session Chair: Daniel Baker, General Motors

8:00 AM
Age Hardening in Lightweight FeMnAl Steels with Nickel Additions: Laura Bartlett[1]; *Michael Piston*[1]; Krista Limmer[2]; Daniel Field[2]; [1]Missouri University of Science & Technology; [2]CC DEVCOM Army Research Laboratory

8:20 AM
Microstructural Refinement in Martensitic and Maraging Steels: *Vikas Sinha*[1]; E.J. Payton[2]; M. Gonzales[2]; [1]Air Force Research Laboratory/UES Inc. ; [2]Air Force Research Laboratory

8:40 AM
Mechanism for Z-phase Formation in 11CrMoVNbN Martensitic Heat-resistant Steel: *Myung-Yeon Kim*[1]; Jae-Hyeok Shim[1]; Young-Kook Lee[2]; Woo-Sang Jung[1]; Young-Su Lee[1]; [1]Korea Institute of Science and Technology; [2]Yonsei university

9:00 AM
Effects of Heat Treatments on High Strength Low-alloy Nitrogen Steel: *John Chinella*[1]; [1]U S Army Research Laboratory

9:20 AM
Correlation of Microstructure and Hardness of Spheroidization Annealed Carbon Steel: *Chang-Young Son*[1]; [1]POSCO/Hot Rolled & Wire Rod Research Group

9:40 AM
Effect of Zr Microalloying on Austenite Grain Size of Low-carbon Steels: *Minghao Shi*[1]; Rangasayee Kannan[1]; Lulu Guo[1]; Xiaoguang Yuan[2]; Leijun Li[1]; [1]University of Alberta; [2]Shenyang University of Technology

10:00 AM Break

10:20 AM
Nanocrystallization during Plasma Nitriding of Steels: *Jiawei Yao*[1]; Mufu Yan[1]; Fuyao Yan[1]; [1]Harbin Institute of Technology

10:40 AM
Effect of Plasma Nitriding at Different Temperatures on Microstructure and Mechanical Properties of AerMet100 Steel: *Baofeng Chen*[1]; Fuyao Yan[1]; Mufu Yan[1]; Yanxiang Zhang[1]; [1]Harbin Institute of Technology

11:00 AM
Microstructural Evolution during Aging of a TRIP-aided Mo-free Lean Duplex Stainless Steel: *Kyung-Tae Park*[1]; Jeomyong Choi[2]; [1]Hanbat National University; [2]Zhangjiagang Pohang STS Co. Ltd.

11:20 AM
Effects of Microstructural Evolution on Corrosion Characteristics of Co-reduced UHS Stainless Steel: *Sungsoo Park*[1]; [1]POSCO

Glasses, Optical Materials, and Devices: Current Issues in Science & Technology — Advanced Characterizations of Glasses and Glass-ceramics

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

Monday AM
September 30, 2019

Room: A106
Location: Oregon Convention Center

Session Chairs: S. K. Sundaram, Alfred University; Sabyasachi Sen, University of California, Davis

8:00 AM Invited
Advanced Nanoscale Characterization of Buried Glass Interfaces by Atom Probe Tomography: *Daniel Schreiber*[1]; Daniel Perea[1]; Karen Kruska[1]; Matthew Olszta[1]; Josef Matyas[1]; Joseph Ryan[1]; [1]Pacific Northwest National Laboratory

8:40 AM Invited
Pentacoordinated Silicon in Alkali Silicate Glasses: Pressure, Temperature and Compositional Effects and Analogies to Borate and Germanate Systems: *Jonathan Stebbins*[1]; Saurav Bista[1]; [1]Stanford University

9:10 AM Invited
Total Scattering Studies of Deformation Behavior of Bulk Metallic Glasses: *Dong Ma*[1]; [1]Oak Ridge National Laboratory

9:40 AM
Scattering of Visible Light by Crystalline Particles in Glass: *Mackenzie Stevens*[1]; Shannon Rogers[1]; Hyojin Lee[1]; Bill Carty[1]; [1]Alfred University

10:00 AM Break

10:20 AM Invited
Structures and Properties of New Sodium Thioborosilicate Glasses: *Steve Martin*[1]; Brittany Curtis[1]; Steven Kmiec[1]; [1]Iowa State University of Science and Technology

10:50 AM
Threshold Detection of Crystalline Particles in Glass by X-ray Diffraction: *Shannon Rogers*[1]; Mackenzie Stevens[1]; Hyojin Lee[1]; William Carty[1]; [1]Alfred University

11:10 AM
Influence of Local Structure of the $CaO\text{-}BO_{1.5}\text{-}AlO_{1.5}$ Melts on Their Thermal Conductivity: *Hodaka Aoki*[1]; Sakae Shirayama[1]; Kazuki Morita[1]; [1]The University of Tokyo

11:30 AM
Synthesis and Electrical Conductivity of a Novel, Vanadium Containing, Mixed Conductor Glass: *Swati Soman*[1]; Mohit Yadav[1]; Ajit Kulkarni[1]; [1]Indian Institute of Technology Bombay

Grain Boundaries, Interfaces, and Surfaces in Functional Materials: Fundamental Structure-Property-Performance Relationships — Modeling of Interface Structure, Chemistry and Transport

Program Organizers: Ming Tang, Rice University; Shen Dillon, University of Illinois, Urbana-Champaign; John Blendell, Purdue University; Wayne Kaplan, Technion - Israel Institute of Technology

Monday AM
September 30, 2019

Room: E143
Location: Oregon Convention Center

Session Chairs: Ming Tang, Rice University; Fadi Abdeljawad, Clemson University

8:00 AM Keynote
Charged Grain Boundaries: Structural, Electrochemical, and Mechanical Effects: Vikrant Karra[1]; *Edwin Garcia*[1]; [1]Purdue University

8:40 AM Invited
Grain Boundary Segregation in Binary and Ternary Alloys: *Fadi Abdeljawad*[1]; [1]Clemson University

9:10 AM
Modeling Solute Interfacial Segregation Effects on θ′ Precipitates in Al-Cu Alloys: *James Morris*[1]; German Samolyuk[1]; Dongwon Shin[1]; Patrick Shower[1]; Lawrence Allard[1]; Matthew Chisholm[1]; Jonathan Poplawsky[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory

9:30 AM
Developing a Realistic Grain Boundary Model to Study Solute Segregation from First Principles: *Malavikha Rajivmoorthy*[1]; Amy Clarke[1]; Mark Eberhart[1]; [1]Colorado School of Mines

9:50 AM
Exploring the Potential Energy Landscape of ∑5(310) Cu Grain Boundary: *Keshab Bashyal*[1]; Lin Li[1]; [1]University of Alabama

10:10 AM Break

10:30 AM Invited
Effective Transport Properties of Polycrystalline Materials: W. Beck Andrews[1]; Erik Hanson[1]; Min-Ju Choe[1]; *Katsuyo Thornton*[1]; [1]University of Michigan

11:00 AM
Anisotropic Mobility of Faceted Σ11 <110> Tilt Grain Boundaries in Face Centered Cubic Metals: *Megan McCarthy*[1]; Timothy Rupert[1]; [1]University of California, Irvine

11:20 AM
Coherent Spinodal Decomposition in Nanoscale Systems: Youtian Zhang[1]; *Ming Tang*[1]; [1]Rice University

Hydrogen Effects on Materials Performance — Hydrogen Effects on Steels

Program Organizers: Samantha Lawrence, Los Alamos National Laboratory; Kip Findley, Colorado School of Mines; Megan Cordill, Erich Schmid Institute for Materials Science

Monday AM
September 30, 2019

Room: E146
Location: Oregon Convention Center

Session Chairs: Kip Findley, Colorado School of Mines; Paul Gibbs, Los Alamos National Laboratory

8:00 AM Introductory Comments

8:10 AM
Hydrogen Embrittlement Testing on Electroplated Compact Samples by the Incremental Step-loading Method: *Simon Laliberté-Riverin*[1]; Jonathan Bellemare[1]; Frédéric Sirois[1]; Myriam Brochu[1]; [1]Polytechnique Montréal

8:30 AM Invited
Effect of Retained Austenite on the Hydrogen Embrittlement Susceptibility in Hot Rolled High Strength Quenching and Partitioning Steels: *Laura Moli Sanchez*[1]; Lode Duprez[1]; Koenraad Theuwissen[1]; [1]ArcelorMittal R&D Gent

9:00 AM
Investigating Hydrogen-assisted Deformation of Oligocrystalline Austenitic Stainless Steel: *Thale Smith*[1]; Coleman Alleman[1]; Chris San Marchi[1]; [1]Sandia National Laboratories

9:20 AM
The Influence of Hydrogen on the Mechanical Response and Microstructure of Additively-manufactured 316L Stainless Steels: *Kaila Bertsch*[1]; Akihide Nagao[2]; Bailey Kuehl[1]; Baily Syring[1]; Dan Thoma[1]; [1]University of Wisconsin - Madison; [2]JFE Steel Corporation

9:40 AM
Key Factors behind Hydrogen Embrittlement of Cadmium Plated 4340 Steel: *Jonathan Bellemare*[1]; Simon Laliberté-Riverin[1]; David Ménard[1]; Myriam Brochu[1]; Frédéric Sirois[1]; [1]Polytechnique Montréal

10:00 AM Break

10:20 AM Invited
Understanding the Bounds of Oxygen Mitigated Hydrogen Embrittlement in Ferritic Steels: *Joseph Ronevich*[1]; Farid El Gabaly[1]; Norm Bartelt[1]; Konrad Thurmer[1]; Chris San Marchi[1]; Rob Kolasinski[1]; [1]Sandia National Laboratories

10:50 AM
Low Cycle Fatigue Behavior of Strain-hardened 316L Stainless Steel for Hydrogen Fuel Cell Vehicles: *Dayane Oliveira*[1]; Jeffery Gibeling[1]; Christopher San Marchi[2]; [1]University of California, Davis; [2]Sandia National Laboratories, Livermore

11:10 AM
Assessing Hydrogen-assisted Fatigue Crack Initiation and Propagation in Austenitic Stainless Steels: *Chris San Marchi*[1]; Paul Gibbs[2]; Kevin Nibur[3]; Guy Bergel[1]; Jay Foulk[1]; [1]Sandia National Laboratories; [2]Los Alamos National Laboratory; [3]Hy-Performance Materials Testing, LLC

11:30 AM
Atmospheric Corrosion and Cracking of SS304 Used for Dry Storage of Spent Nuclear Fuel: Jenifer Locke[1]; *Jay Srinivasan*[1]; Timothy Weirich[1]; Jason Taylor[2]; Charles Bryan[2]; Eric Schindelholz[2]; [1]Ohio State University; [2]Sandia National Laboratory

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

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

Monday AM
September 30, 2019

Room: G132
Location: Oregon Convention Center

Session Chairs: Abigail Hunter, Los Alamos National Laboratory; Tim Rupert, University of California, Irvine

8:00 AM Invited
Coupled Experimental and Computational Studies of Amorphous Grain Boundary Complexions: *Timothy Rupert*[1]; [1]University of California, Irvine

8:30 AM Invited
Development of Microstructure-sensitive and Mechanism-based Modeling Tools by Integrating Experimental Characterization with Multiscale Modeling: Longsheng Feng[1]; Pengyang Zhao[1]; Steve Niezgoda[1]; Michael Mills[1]; *Yunzhi Wang*[1]; [1]Ohio State University

9:00 AM
Discovery of a Wide Variety of Linear Complexions in Metallic Alloys: *Vladyslav Turlo*[1]; Timothy Rupert[1]; [1]University of California, Irvine

9:20 AM
Linking Strongest Grain Size to Underlying Deformation Mechanisms in Nanocrystalline Materials: Ankit Gupta[1]; Gregory Thompson[2]; *Garritt Tucker*[1]; [1]Colorado School of Mines; [2]University of Alabama

9:40 AM
Computation of Embrittling Potencies of Sulfur for a Range of Nickel Pure Tilt Grain Boundaries via Atomistic Simulation Methods: *Doruk Aksoy*[1]; Rémi Dingreville[2]; Douglas E. Spearot[1]; [1]University Of Florida; [2]Sandia National Labs

10:00 AM Break

10:20 AM Invited
Integration between Modeling and Experiments at the Micron Scale: *Laurent Capolungo*[1]; Aaron Tallman[1]; Aaron Kohnert[1]; Darshan Bamney[2]; Douglas Spearot[2]; Ricardo Lebensohn[1]; [1]Los Alamos National Laboratory; [2]University of Florida

10:50 AM Invited
Phase Field Dislocation Dynamics (PFDD) for Nanoscale Metals: Xiaoyao Peng[1]; Nithin Mathew[2]; Irene Beyerlein[3]; Kaushik Dayal[1]; *Abigail Hunter*[2]; [1]Carnegie Mellon University; [2]Los Alamos National Laboratory; [3]University of California, Santa Barbara

11:20 AM
Implementing Grain Boundaries in Phase-field Dislocation Dynamics: Tengfei Ma[1]; Pranay Chakraborty[1]; *Lei Cao*[1]; [1]University of Nevada

11:40 AM
Growth of Twin Embryos by Disconnection Propagation in Mg: Molecular Dynamics and Continuum Modeling: *Yang Hu*[1]; Vladyslav Turlo[1]; Subhash Mahajan[2]; Irene Beyerlein[3]; Enrique Lavernia[1]; Julie Schoenung[1]; Timothy Rupert[1]; [1]University of California, Irvine; [2]University of California, Davis; [3]University of California, Santa Barbara

Joining of Advanced and Specialty Materials XXI — Friction and Friction Stir Welding I

Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee; Hiroaki Mori, Osaka University; Yuri Hovanski, Brigham Young University; Darren Barborak, WeldQC Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell; Zhenzhen Yu, Colorado School of Mines

Monday AM
September 30, 2019

Room: Portland Ballroom 252
Location: Oregon Convention Center

Session Chair: Yuri Hovanski, Brigham Young University

8:00 AM Keynote
Friction Stir Welding of Creep Strength Enhanced Ferritic Steels for Power Plant Applications: *Glenn Grant*[1]; Jens Darsell[1]; Arun Devaraj[1]; Dalong Zhang[1]; Hellen Jiang[1]; [1]Pacific Northwest National Laboratory

8:40 AM Invited
Physical and Numerical Simulation of Friction Stir Welding for Al-based Alloys: *Anton Naumov*[1]; Anatolii Borisov[1]; Anastasiya Doroshchenkova[1]; Hannes Wenzel[2]; [1]Peter the Great St. Petersburg Polytechnic University; [2]Brandenburg University of Technology (BTU) Cottbus – Senftenberg

9:00 AM Invited
Modeling of Local Flow Stresses Near the Tool in Friction Stir Welding of 2xxx Series Aluminum: *Michael Miles*[1]; Tracy Nelson[1]; [1]Brigham Young University

9:20 AM Invited
High Speed Friction Stir Lap Welding of Al Alloys: *Piyush Upadhyay*[1]; Li Xiao[1]; Tim Roosendaal[1]; [1]Pacific Northwest National Laboratory

9:40 AM
Effect of Post Weld Heat Treatment on Microstructure and Mechanical Properties of Linear Friction Welded Ti-6Al-4V: Sidharth Rajan[1]; *Priti Wanjara*[2]; Javad Gholipour Baradari[2]; Abu Syed Kabir[1]; [1]Carleton University; [2]National Research Council Canada

10:00 AM Break

10:20 AM
Basic Study on Numerical Analysis of Friction Stir Welded Dissimilar Joint with New Particle Method based on MPS: *Hisashi Serizawa*[1]; Kenta Mitsufuji[2]; Fumikazu Miyasaka[2]; [1]JWRI, Osaka University; [2]Osaka University

10:40 AM
Development of a Numerical Model for Dissimilar Lap Joint FSW by using Particle Method: *Fumikazu Miyasaka*[1]; Kenta Mitsufuji[1]; [1]Osaka University
1

11:00 AM
Transient Microstructure Evolution during Friction Stir Processing of Dual Phase Advanced High Strength Steel.: *Koichi Taniguchi*[1]; Yong Chae Lim[2]; Zhili Feng[2]; [1]JFE Steel corporation; [2]Oak Ridge National Laboratory

11:20 AM
A Meshless Approach for 3D Modeling of Linear Friction Welding Process: Srujan Rokkam[1]; *Quang Truong*[1]; [1]Advanced Cooling Technologies, Inc.

11:40 AM
Load-Deflection Relationship and Feedback Position Control to Compensate for the welding System During Friction Stir Welding: Jinyoung Yoon; Minjung Kang[1]; *Cheolhee Kim*; [1]KITECH

Materials for Nuclear Applications — Metallic Systems

Program Organizers: Philip Edmondson, Oak Ridge National Laboratory; Yutai Katoh, Oak Ridge National Laboratory; Jake Amoroso, Savannah River National Laboratory; Levi Gardner, University of Utah; Amy Gandy, University of Sheffield; Karl Whittle, University of Liverpool; Monica Ferraris, Politecnico di Torino

Monday AM
September 30, 2019

Room: E148
Location: Oregon Convention Center

Session Chairs: Philip Edmondson, Oak Ridge National Laboratory; Djamel Kaoumi, NC State University

8:00 AM
Evolution of Microstructure, Deformation Mechanisms, and Internal Damage During Creep-Fatigue Testing of Alloy 709 (Fe-20Cr-25Ni): *Ty Porter*[1]; Kip Findley[1]; Michael Kaufman[1]; Richard Wright[2]; [1]Colorado School of Mines; [2]Idaho National Laboratory

8:20 AM
Enhancing the Properties of a Cast FeNiMnCr10 Co-free High-entropy Alloy Through Hot Rolling: *Hans Pommerenke*[1]; Jiaqi Duan[1]; Matthew Luebbe[1]; Nathan Curtis[1]; Haiming Wen[1]; [1]Missouri University of Science and Technology

8:40 AM
Effects of Ti and Al Additions on Irradiation Behavior of FeMnNiCr Based High-Entropy Alloys: *Matthew Luebbe*[1]; Andrew Hoffman[1]; Hans Pommeranke[1]; Li He[2]; Kumar Sridharan[2]; Haiming Wen[1]; [1]Missouri Univerisity of Science and Technology; [2]University of Wisconsin

9:00 AM
Aging Behavior and Microstructure Evolution in Ni-Cr-Mo-W (Haynes 244) Alloy After Surface Treatment by Laser Shock Peening (LSP): *Jie Song*[1]; Anurag Sharma[1]; Seetha Mannava[1]; Vijay Vasudevan[1]; [1]University of Cincinnati

9:20 AM
A Metallic Multilayer Composite for use in Fluoride Molten Salt Reactors: Samuel McAlpine[1]; *Govindarajan Muralidharan*[2]; Seong Gu Kim[3]; Michael Short[1]; [1]Massachusetts Institute of Technology; [2]Oak Ridge National Laboratory; [3]University of New Mexico

10:00 AM Break

10:20 AM
Rapid Multiscale Simulation of Cladding Performance: Application to HT-9: *Aaron Tallman*[1]; Arul Mariyappan[1]; Wei Wen[1]; Laurent Capolungo[1]; Carlos Tome[1]; [1]Los Alamos National Laboratories

10:40 AM
Anisotropy in Thermal Creep and Creep Life Prediction of Zr-2.5%Nb Pressure Tube Alloy: *Vivek Patel*[1]; Ram Niwas Singh[1]; [1]Homi Bhabha National Institute

11:00 AM
In-situ Characterization of Zirconium Alloy Degradation to Support Nuclear Sensing Applications: *Michael Reynolds*[1]; Corey Efaw[1]; Samuel McMurdie[1]; Pete Barnes[1]; Hongqiang Hu[2]; Claire Xiong[1]; Michael Hurley[1]; [1]Boise State University; [2]Idaho National Laboratory

11:20 AM
Effect of Ultrasonic Nanocrystalline Surface Modification (UNSM) on the Oxidation Behavior of Alloy 800HT in a Supercritical Carbon Dioxide (SCO2) Environment: *Richard Chiang*[1]; Sebastien Teysseyre[2]; Jeffery Aguiar[3]; Lucas Teeter[4]; Julie Tucker[4]; Vijay Vasudevan[1]; [1]University Of Cincinnati; [2]Canadian Nuclear Laboratories; [3]Idaho National Laboratory; [4]Oregon State University

11:40 AM
The Effects of Ultrasonic Nanocrystal Surface Modification at Room Temperature and Elevated Temperatures on Residual Stress, Microstructure and Mechanical Properties of Nuclear Alloys IN600 and IN690.: *Harsha Venkat S Naralasetty*[1]; Auezkhan Amanov[2]; Young Sik Pyoun[2]; Jie Song[1]; Nicholas Mohr[3]; Seetha R. Mannava[1]; Vijay Vasudevan[1]; [1]University of Cincinnati; [2]Sun Moon University; [3]Electric Power Research Institute

Materials Issues in Nuclear Waste Management — Materials Issues in Nuclear Waste Technology I: Properties of Nuclear Waste Forms: Modeling, Experiments, and Applications

Program Organizers: Jake Amoroso, Savannah River National Laboratory; Kyle Brinkman, Clemson University; Kevin Fox, Savannah River National Laboratory; Cory Trivelpiece, Savannah River National Laboratory; Jarrod Crum, Pacific Northwest National Laboratory

Monday AM
September 30, 2019

Room: E147
Location: Oregon Convention Center

Session Chairs: Jake Amoroso, Savannah River National Laboratory; Kevin Fox, Savannah River National Laboratory

8:00 AM Invited
Disorder and Mass Transport in Model Waste Forms: *Blas Uberuaga*[1]; [1]Los Alamos National Laboratory

8:40 AM
Investigations into Physical and Chemical Characteristics of Nuclear Waste Glass Alteration Layers: *Joelle Reiser*[1]; Joseph Ryan[1]; Benjamin Parruzot[1]; [1]Pacific Northwest National Laboratory

9:00 AM Invited
The Relationship between Zeolite Type and Glass Dissolution Rate Resumption: *James Neeway*[1]; Radha Motkuri[1]; Jarrod Crum[1]; Emily Freeman[2]; Giannis Mpourmpakis[2]; Adam Mallette[3]; Jeffrey Rimer[3]; [1]Pacific Northwest National Laboratory; [2]University of Pittsburgh; [3]University of Houston

9:40 AM
Thermodynamics of Zeolite Precipitation in Stage III Glass Corrosion: *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

10:00 AM Break

10:20 AM
Predicting the Density of High-Level Waste Glass Compositions: *Cory Trivelpiece*[1]; Thomas Edwards[1]; [1]Savannah River National Laboratory

10:40 AM
Modeling of Carbonation Effects in a Cementitious Waste Form under Dry Environmental Conditions: *Peng Zhang*[1]; Zhiliang Chen[1]; Andrew Garrabrants[1]; Kevin Brown[1]; J.C.L. Meeussen[2]; Hans van der Sloot[3]; David Kosson[1]; [1]Vanderbilt University; [2]Nuclear Research Group, Netherlands; [3]Hans van der Sloot Consultancy, Netherlands

11:00 AM
Energetics and Structure of Uranium-incorporated Iron Oxides: *Andy Lam*[1]; Katherine Morris[2]; Samuel Shaw[2]; Jesús Velázquez[1]; Alexandra Navrotsky[1]; [1]University of California, Davis; [2]University of Manchester

11:20 AM
Electrical Properties of Nuclear Glasses: Muriel Neyret[1]; Dylan Jouglard[1]; Norma Pereira Machado[1]; *Rafael Bianchini Nuernberg*[1]; Leire del Campo[2]; Mohammed Malki[2]; Andrea Piarristeguy[3]; Annie Pradel[3]; [1]CEA Marcoule; [2]CNRS-CEMHTI; [3]CNRS-ICG-Université de Montpellier

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

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

Monday AM
September 30, 2019

Room: F149
Location: Oregon Convention Center

Session Chairs: Thomas Zega, University of Arizona; Jessica Rimsza, Sandia National Laboratories

8:00 AM Introductory Comments

8:10 AM Invited
Molecules, Nanoclusters and Materials in the Extreme Environment of Interstellar Space: *Lucy Ziurys*[1]; [1]University of Arizona

8:40 AM
Transmission Electron Microscopy of Refractory Minerals from Primitive Chondritic Meteorites: *Tarunika Ramprasad*[1]; Thomas Zega[2]; [1]Material Science and Engineering, University of Arizona; [2]Lunar and Planetary Laboratory, University of Arizona

9:00 AM
Combining the Tools of Atomic-scale Characterization with Density-functional Theory and Thermodynamic Modeling to Unravel the Origins of the First Solar-system Solids: *Thomas Zega*[1]; Venkat Manga[1]; Krishna Muralidharan[1]; [1]University of Arizona

9:20 AM
Atomistic Insights into Grain Collision Dynamics in the Solar Nebula: Benjamin Geller[1]; *Steven Baro*[1]; Krishna Muralidharan[1]; [1]University of Arizona

9:40 AM Invited
Deciphering the Energy Landscapes of Solvated Interfaces: An Integrative Approach of Experimental Thermodynamics and Computational Chemistry: *Nadine Kabengi*[1]; James D. Kubicki[2]; [1]Georgia State University; [2]The University of Texas at El Paso

10:10 AM Break

10:30 AM
Synthesis and Characterization of Ceramic Foams from Earth Abundant Materials: *Pratish Rao*[1]; Krishna Muralidharan[1]; Moe Momayez[1]; Keith Runge[1]; [1]University of Arizona

10:50 AM
Thermodynamics of (111) Twin Complexions in Spinel: A First-principles Study: *Venkateswara Manga*[1]; Thomas Zega[1]; [1]University of Arizona

Mechanochemical Synthesis and Reactions in Materials Science IV — Session I

Program Organizers: Antonio Fuentes, Cinvestav Unidad Saltillo; Laszlo Takacs, University of Maryland Baltimore County; Challapalli Suryanarayana, University of Central Florida; Jacques Huot, Universite du Quebec a Trois-Rivieres

Monday AM
September 30, 2019

Room: E141
Location: Oregon Convention Center

Session Chairs: Antonio Fuentes, Cinvestav del IPN; Jacques Huot, Universite du Quebec a Trois-Rivieres

8:00 AM Invited
In-situ Synthesis of AlN-CNT Nanocomposites by Mechanochemical Reaction of Al and Melamine: *Jurgen Eckert*[1]; Seyyed Amin Rounaghi[2]; Hossein Eshghi[3]; Sergio Scudino[4]; Elaheh Esmaeili[2]; Ali-Reza Kiani-Rashid[3]; [1]Erich Schmid Institute of Materials Science; [2]Birjand University of Technology; [3]Ferdowsi University of Mashhad; [4]IFW Dresden

8:40 AM Invited
Effect on Phase Evolution and Thermal Stability of Mechanically Alloyed AlCoCrFeNi High-entropy Alloy on Addition of Mn and Ti: *Nilay Mukhopadhyay*[1]; Vikas Shivam[1]; Joysurya Basu[1]; [1]Indian Institute of Technology (BHU)

9:20 AM Invited
A Mechanochemical Effect in Cutting of Ductile Metals: Anirudh Udupa[1]; Tatsuya Sugihara[2]; Jason Davis[1]; Mojib Saei[1]; James Mann[3]; Srinivasan Chandrasekar[1]; *Kevin Trumble*[1]; [1]Purdue University; [2]Osaka University; [3]University of West Florida

10:00 AM Break

10:20 AM
Influence of Al Addition on Phase Evolution and Thermal Stability of CoCrFeNiTi High-entropy Alloy Processed by Mechanical Alloying: *Vikas Shivam*[1]; Joysurya Basu[1]; N. Mukhopadhyay[1]; [1]Indian Institute of Technology (BHU) Varanasi

10:40 AM
Mechanically Activated SHS of Silicon-based Nanostructured Materials: *Sergio Cordova*[1]; Rodrigo Mesta[1]; Evgeny Shafirovich[1]; [1]University of Texas at El Paso

11:00 AM
Neutron Total Scattering Analysis of Materials Processed by Far-from-equilibrium Methods: *Eric O'Quinn*[1]; Joerg Neuefeind[2]; Antonio Fuentes[3]; Matthew Tucker[2]; Maik Lang[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory; [3]Cinvestav Unidad Saltillo

11:20 AM
Mechanically Driven Phase Transformation in Sn Reinforced Al-Cu-Fe Quasicrystalline Matrix Nanocomposite: Influence of Mechanical Milling and Cryomilling: *Yagnesh Shadangi*[1]; Joysurya Basu[1]; Kausik Chattopadhyay[1]; Bhaskar Majumdar[2]; Nilay Mukhopadhyay[1]; [1]IIT BHU; [2]Defence Metallurgical Research Laboratory

11:40 AM
Mechanically Activated Combustion Synthesis of Nb5Si3/Nb Composites: *Reina Trevino*[1]; Edgar Maguregui[1]; Evgeny Shafirovich[1]; [1]University of Texas at El Paso

Metal and Polymer Matrix Composites IV — Polymer Matrix Composites I

Program Organizers: Nikhil Gupta, New York University; Tomoko Sano, U.S. Army Research Laboratory

Monday AM
September 30, 2019

Room: D136
Location: Oregon Convention Center

Session Chairs: Kunal Kate, University of Louisville; Ozgur Keles, San Jose State University

8:00 AM Introductory Comments

8:10 AM Invited
Fused Filament Fabrication 3D Printing of Kenaf Fiber Reinforced Polymer Composites: Maxim Livchak[1]; Rajeeva Thilakaratne[1]; Paramjot Singh[1]; Jagannadh Satyavolu[1]; *Kunal Kate*[1]; [1]University of Louisville

8:30 AM Invited
Super Water Repellant Cellulose Acetate Mats: *Fateh Mikaeili*[1]; Perena Gouma[1]; [1]Ohio State University

8:50 AM
Mechanical Behavior of 3D Printed Continuous Glass-fiber-reinforced Nylon: *Ozgur Keles*[1]; Stephanie Luke[1]; David Soares[1]; Afrah Siddiqi[1]; [1]San Jose State University

9:10 AM
Microstructure-controlled Damage Mechanisms in Elastomer-matrix Syntactic Foams: Quantitative 3D Analyses from In situ XCT Experiments: *Brendan Croom*[1]; Helena Jin[2]; Judith Brown[2]; Jay Carroll[2]; Kevin Long[2]; Xiaodong Li[1]; [1]University of Virginia; [2]Sandia National Laboratories

9:30 AM
The Tribological Behavior of Polytetrafluroethylene (PTFE) Composites: *Akshata Patil*[1]; [1]Dover India Pvt. Ltd.

9:50 AM
Unveiling the Effects of Tow Architecture Variability on the Performance of Continuous Fiber Reinforced Composite Tubes: *Frederick Heim*[1]; John Daspit[1]; Xiaodong Li[1]; [1]University of Virginia

10:10 AM Break

10:30 AM
A Study of the Effect of Mixing Method and Particle Size on Polymer Composites: *Morgan Watt*[1]; Rosario Gerhardt[1]; [1]Georgia Institute of Technology

10:50 AM
Hydroxylated Boron Nitride Nanotube Reinforced Polyvinyl Alcohol Nanocomposite Films with Simultaneous Improvement of Mechanical and Thermal Properties: *Xiaolong Lu*[1]; Jenniffer Bustillos[1]; Pranjal Nautiyal[1]; Tyler Dolmetsch[1]; Cheng Zhang[1]; Tony Thomas[1]; Yao Chen[2]; Benjamin Boesl[1]; Arvind Agarwal[1]; [1]Florida International University; [2]Soochow University

11:10 AM
On the Potential of PEEK-MAX Composites for Biomedical Applications: *Sabah Javaid*[1]; Maharshi Dey[1]; Caleb Matzke[1]; Naima Kaabouch[1]; Surojit Gupta[1]; [1]University of North Dakota

Metamorphic Manufacturing – Incremental Deformation Processing for Agile, High-quality Metallic Component Production — Metamorphic Manufacturing I: Concepts and Pathways

Program Organizers: Kester Clarke, Colorado School of Mines; Glenn Daehn, Ohio State University

Monday AM
September 30, 2019

Room: D138
Location: Oregon Convention Center

Session Chairs: Kester Clarke, Colorado School of Mines; Glenn Daehn, The Ohio State University

8:20 AM Introductory Comments Glenn Daehn, The Ohio State University

8:35 AM
Metamorphic Manufacturing: A View from Two Perspectives: *George Spanos*[1]; Michael Rawlings[1]; [1]TMS

8:55 AM Invited
Comparison of Robotic Blacksmithing, 3D Printing and CNC Machining for Aerospace Replacement Parts: *Nathan Ames*[1]; Ed Herderick[1]; Marc Purslow[1]; Blair Woodring[1]; [1]Ohio State University

9:35 AM
Robotic Blacksmithing, Building on Past Success: *Brian Thurston*[1]; [1]Daehn Research Group

9:55 AM Break

10:15 AM Invited
Opportunities and Challenges in Flexible Dieless Forming - A Summary of Double-Sided Incremental Forming (DSIF) Work at Northwestern University: *Jian Cao*[1]; [1]Northwestern University

10:55 AM
Rapid Prototyping of Forming Tools Using 4340 Steel Through Additive Manufacturing: *Ryan Mier*[1]; Colt Montgomery[1]; [1]Los Alamos National Labs

11:15 AM
Metamorphic Manufacturing Activities and Evolving Opportunities at Case Western Reserve University: *John Lewandowski*[1]; Roger Quinn[1]; Kenneth Loparo[1]; Robert Gao[1]; [1]Case Western Reserve University

Modeling Variability of Mechanical Behavior through ICME Techniques with Emphasis on Verification, Validation & Uncertainty Quantification — Additive Manufacturing

Program Organizers: Jacob Hochhalter, University of Utah; Michael Sangid, Purdue University; Corbett Battaile, Sandia National Laboratories; Barron Bichon, Southwest Research Institutue

Monday AM
September 30, 2019

Room: D135
Location: Oregon Convention Center

Session Chairs: Jacob Hochhalter, University of Utah; Harry Millwater, UTSA

8:00 AM Invited
NASA's Engineering Predictive Practices for Durability and Damage Tolerance (D&DT) of Thin Walled Materials: *Richard Russell*[1]; [1]NASA

8:30 AM Invited
Development and Transition of a Computational Materials Framework to Support Qualification of Additively Manufactured Components: Edward Glaessgen[1]; *Michael Gorelik*[2]; [1]NASA Langley Research Center; [2]Federal Aviation Administration

9:00 AM
Simulating the Impact of Process Parameters on Microstructure for the Powder Bed Fusion Process: *Christapher Lang*[1]; Saikumar Yeratapally[2]; Edward Glaessgen[1]; [1]NASA Langley Research Center; [2]National Institute of Aerospace

9:20 AM
Simulations to understand the effects of pores on the mechanical behavior of materials produced using powder bed fusion process: *Saikumar Reddy Yeratapally*[1]; Christapher Lang[2]; Edward Glaessgen[2]; [1]National Institute Of Aerospace; [2]NASA Langley Research Center

9:40 AM Invited
Next Steps for Probabilistic Modeling of Additive Manufacturing of Titanium Alloys: Thomas Ales[1]; A. Baker[1]; H. L. Fraser[1]; D.G. Harlow[1]; Y. Wang[1]; *Peter Collins*[1]; [1]Iowa State University

10:10 AM Break

10:30 AM
Multi-scale Additive Manufacturing Process Simulation: Application of CALPHAD Modeling Tools to Determine Material Properties Relevant to Part Scale Models: *Ryan Jennings*[1]; [1]Kansas City National Security Campus

10:50 AM Invited
The Stochastic Behavior of Additive Lattices: *Brad Boyce*[1]; Bradley Jared[1]; Ashley Roach[2]; Jared Allison[3]; Amber Dressler[1]; Carolyn Seepersad[3]; [1]Sandia National Laboratories; [2]University of California at Santa Barbara; [3]University of Texas at Austin

11:10 AM
Fatigue Crack Growth Surrogate Models from Symbolic Regression for Use during Topology Optimization: *Keven Carlson*[1]; Geoffrey Bomarito[2]; Miguel Aguilo[3]; Jacob Hochhalter[1]; [1]University of Utah; [2]NASA Langley Research Center; [3]Sandia National Laboratories

Multi-scale Modeling of Microstructure Deformation in Material Processing — Multi-scale Modeling of Microstructure Deformation in Material Processing I

Program Organizers: Lukasz Madej, AGH University of Science and Technology; Jaimie Tiley, Air Force Office of Scientific Research (AFOSR/RTA); Krzysztof Muszka, AGH University of Science and Technology; Danuta Szeliga, AGH University of Science and Technology

Monday AM
September 30, 2019

Room: D134
Location: Oregon Convention Center

Session Chair: Lukasz Madej, AGH University

8:00 AM
Analytical Solution to Local Relaxation of Polycrystals Due to Elastic Sliding of Grains: *Shoieb Chowdhury*[1]; Hesam Askari[1]; [1]University of Rochester

8:20 AM
Application of the Concurrent Atomistic-continuum (CAC) Method to Dislocation Reaction Pathway Modeling in FCC Metals.: *Kevin Chu*[1]; Dengke Chen[1]; Adrian Diaz[2]; Alex Selimov[1]; Youping Chen[2]; Ting Zhu[1]; David McDowell[1]; [1]Georgia Institute of Technology; [2]University of Florida

8:40 AM
Correlating Macro-scale Fracture Behavior with Microstructural Attributes in Polycrystalline Metals: *Ushasi Roy*[1]; Min Zhou[1]; [1]Georgia Institute of Technology

9:00 AM
DCPC Measurement of Crack Initiation in Inconel 718: A Large Data Investigation of Creep Noise: *Joel Lindsay*[1]; Stefanos Papanikolaou[1]; Terence Musho[1]; [1]West Virginia University - Evansdale Campus

9:20 AM
Multi-cell Monte Carlo for Phase Prediction: *You Rao*[1]; Changning Niu[1]; Wolfgang Windl[1]; Maryam Ghazisaeidi[1]; [1]Ohio State University

9:40 AM
Physical and Numerical Simulation of Surface Modification of Structural Metal Alloys through Ultrasonic Impact Treatment: *Benjamin Adam*[1]; Graham Tewksbury[1]; Lemmy Meekisho[1]; Ryan Smith[1]; Tae-Kyu Lee[1]; [1]Portland State University

10:00 AM Break

10:20 AM
Combining High-Energy X-ray Diffraction Microscopy Data and Crystal Finite Element Modeling for Macroscale Flow Stress Predictions in Ti-7Al: *Darren Pagan*[1]; Nathan Barton[2]; Paul Shade[3]; Joel Bernier[2]; [1]Cornell High Energy Synchrotron Source; [2]Lawrence Livermore National Laboratory; [3]Air Force Research Laboratory

10:40 AM
Microstructure-sensitive Computational Estimates of Driving Forces for Surface vs. Subsurface Fatigue Crack Formation in Duplex Ti-6Al-4V and Al 7075-T6: *Krzysztof Stopka*[1]; David McDowell[1]; [1]Georgia Institute of Technology

11:00 AM
Numerical Modelling of Dendritic Grain Formation and Growth during Al-Si Alloy Solidification Process with Varying Physical Parameters-A Phase Field Study: *Kun Dou*[1]; [1]Brunel University London

11:20 AM
Phase Field-crystal Plasticity Model for Dynamic Recrystallization: *Yulan Li*[1]; Shenyang Hu[1]; Erin Barker[1]; Suveen Mathaudhu[2]; [1]Pacific Northwest National Laboratory; [2]University of California-Riverside

11:40 AM
Phase Field Simulations of Precipiates in Nickel-based Superalloys: *Markus Holzinger*[1]; Felix Schleifer[1]; Michael Fleck[1]; Uwe Glatzel[1]; [1]University Bayreuth

Multifunctional Ceramic- and Metal-matrix Composites: Processing, Microstructure, Properties and Performance — Characterization and Properties of Ceramic and Metal Matrix Composites

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

Monday AM
September 30, 2019
Room: C125
Location: Oregon Convention Center

Session Chair: Martin Pech-Canul, Cinvestav IPN Saltillo

8:00 AM
Mechanical Response of Graphene-Loaded Silicon Oxycarbide: *Elizabeth Barrios*[1]; Nina Orlovskaya[1]; Lei Zhai[1]; [1]University of Central Florida

8:20 AM
Nanocarbon-reinforced Metal-matrix Nanocomposites: *Andrea Bachmaier*[1]; Andreas Katzensteiner[1]; Reinhard Pippan[1]; [1]Erich Schmid Institute

8:40 AM
Comparison of In-situ Aluminum Metal Matrix Composite Processes: *Aaron Gladstein*[1]; Caleb Reese[1]; Alan Taub[1]; [1]University of Michigan

9:00 AM
Fabrication and High-temperature Bending Strength of Fully-dense ZrB2/50vol%B4C Composites: Ken Hirota[1]; *Tung Le*[1]; Masaki Kato[1]; Hiroyuki Miyamoto[1]; Motohiro Yuasa[1]; Toshiyuki Nishimura[2]; [1]Doshisha University; [2]National Institute for Materials Science

9:20 AM
Mechanical Strengthening of Aluminosilicate Composites with Graphene Oxide Fillers: Pratish Rao[1]; *Madison Sitkiewicz*[1]; Krishna Muralidharan[1]; Moe Momayez[1]; Keith Runge[1]; [1]University of Arizona

9:40 AM Invited
Thermally-Conductive, Mechanically-Robust, Net-Shape Ceramic/Metal Composites for High-Temperature Concentrated Solar Power: *Kenneth Sandhage*[1]; Mario Caccia[1]; Meysam Tabandeh-Khorshi[1]; Grigorios Itskos[1]; Alex Strayer[1]; Adam Caldwell[1]; Supattra Singnisai[1]; Anthony Schroeder[2]; Mark Anderson[2]; Andres Marquez-Rossy[3]; Edgar Lara-Curzio[3]; Sandeep Pidaparti[4]; Devesh Ranjan[4]; Andrew Rohskopf[4]; Asegun Henry[5]; [1]Purdue University; [2]University of Wisconsin; [3]Oak Ridge National Laboratory; [4]Georgia Institute of Technology; [5]Massachusetts Institute of Technology

10:00 AM Break

10:20 AM
Fabrication of Stainless Steel Matrix Composite Reinforced with 3D Networked TiN: Seong-Beum Kim[1]; Soo-Hyun Kim[1]; *Jung-Wook Cho*[1]; [1]Postech

10:40 AM
Shear-Assisted Processing and Extrusion: A Novel Solid Phase Processing of Making Bulk Size Metal-matrix-composite without Agglomeration: *Xiao Li*[1]; Nathan Canfield[1]; Jens Darsell[1]; Chen Zhou[2]; Hongliang Wang[2]; James Schroth[2]; Glenn Grant[1]; [1]Pacific Northwest National Laboratory; [2]General Motors R&D Center

Nanostructured Materials under Extreme Environments — Materials Designed for Radiation Environment I

Program Organizers: Jin Li, Purdue University; Assel Aitkaliyeva, University of Florida; Youxing Chen, University of North Carolina at Charlotte; Yue Liu, Shanghai Jiao Tong University; Shuai Shao, Louisiana State University

Monday AM
September 30, 2019
Room: D133
Location: Oregon Convention Center

Session Chairs: Jin Li, Purdue University; Assel Aitkaliyeva, University of Florida

8:00 AM Invited
Radiation Tolerance and Mechanical Properties of Nanostructured Amorphous-ceramic/metal Composites: *Michael Nastasi*[1]; [1]University of Nebraska-Lincoln

8:30 AM Invited
Radiation Response of Nanoporous Metals: *Xinghang Zhang*[1]; Jin Li[1]; Cuncai Fan[1]; Meimei Li[2]; Haiyan Wang[1]; [1]Purdue University; [2]Argonne National Laboratory

9:00 AM Invited
Mechanically Characterizing Soft Spots in Nanostructured Ferritic Alloy 14YWT: *Jordan Weaver*[1]; Eda Aydogan[2]; Nathan Mara[3]; David Hoelzer[4]; G. Robert Odette[5]; Stuart Maloy[6]; [1]National Institute of Standards and Technology; [2]Sabanci University; [3]University of Minnesota-Twin Cities; [4]Oak Ridge National Laboratory; [5]University of California, Santa Barbara; [6]Los Alamos National Laboratory

9:30 AM Invited
Radiation Damage of Tungsten: Nanocrystalline Versus Coarse Grain Microstructures: *Qiuming Wei*[1]; Zhe Chen[1]; Kaigui Zhu[2]; [1]University of North Carolina, Charlotte; [2]Beihang University

10:00 AM Break

10:20 AM Invited
Nanomechanical Testing of Irradiated Nanostructured and Immiscible Alloys: *Janelle Wharry*[1]; Priyam Patki[1]; Kayla Yano[1]; George Warren[1]; Chidubem Enebechi[1]; Yash Pachaury[1]; Anter El-Azab[1]; Yaqiao Wu[2]; Jatuporn Burns[2]; [1]Purdue University; [2]Boise State University, Center for Advanced Energy Studies

10:50 AM Invited
Heavy Ion Irradiation of 3D Printed 316L Stainless Steels: *Miao Song*[1]; Xiaoyuan Lou[2]; [1]University of Michigan; [2]Auburn University

11:20 AM
Effect of Irradiation on Microstructure and Mechanical Properties of Mmetal Matrix Nanocomposite: *Trevor Clark*[1]; Arun Devaraj[2]; Suveen Mathaudhu[3]; Khalid Hattar[1]; [1]Sandia National Laboratories; [2]Pacific Northwest National Laboratory; [3]University of California Riverside

Next Generation Biomaterials — Next Generation Biomaterials I

Program Organizers: Roger Narayan, University of North Carolina; Federico Rosei, INRS Centre for Energy, Materials and Telecommunications

Monday AM
September 30, 2019

Room: C122
Location: Oregon Convention Center

Session Chairs: Nima Rahbar, Worcester Polytechnic Institute; Vilupanur Ravi, California State Polytechnic University, Pomona

8:00 AM Invited
Biocorrosion and Biocompatibility of Advanced Titanium Alloys: *Vilupanur Ravi*[1]; [1]California State Polytechnic University, Pomona

8:20 AM Invited
Biomimetic based Approaches for Design of Engineering Testbeds of Cancer: *Kalpana Katti*[1]; Dinesh Katti[1]; [1]North Dakota State University

8:40 AM
Therapeutic Ion-releasing Glasses to Enhance Bone Formation: An Overview of the Structure, Solubility, and Biocompatibility: *Sahar Mokhtari*[1]; Anthony Wren[1]; [1]Alfred University

9:00 AM Invited
Invited: High-Throughput Electrospinning of 3D scaffolds and Sensing Probes: *Pelagia Gouma*[1]; [1]The Ohio State University

9:20 AM Invited
Magnetic Nanoparticles for the Specific Targeting of Triple Negative Breast Cancer: *John Obayemi*[1]; Jingjie Hu[2]; Ali Salifu[1]; Karen Malatesta[3]; Winston Soboyejo[1]; [1]Worcester Polytechnic Institute (WPI); [2]Mayo Clinic; Princeton University; [3]Princeton University

9:40 AM Invited
Multi-component Biomolecular Assembly to Harness New Functions at the Interfaces: *Candan Tamerler*[1]; [1]University of Kansas

10:00 AM Break

10:20 AM Invited
Silica-calcium Phosphate Composite: A Multifunctional Bioceramic Platform for Innovative Therapy: *Ahmed El-Ghannam*[1]; [1]University of North Carolina at Charlotte

10:40 AM Invited
Silicon Oxynitride, a New Antioxidant, Osteokine, and Myokine Pathway Control for MSK Healing: *Venu Varanasi*[1]; [1]University of Texas at Arlington

11:00 AM Invited
3D Printed Bioactive Glass Scaffolds: *Aisling Coughlan*[1]; [1]The University of Toledo

11:20 AM Invited
Computationally Driven Design of Nanomaterials and Scaffolds for Tissue Regeneration: *Dinesh Katti*[1]; Kalpana Katti[1]; [1]North Dakota State University

11:40 AM Invited
Bioinspired Design of Next Generation Structural and Thermal Materials: *Nima Rahbar*[1]; [1]Worcester Polytechnic Institute

Perspectives for Emerging Materials Professionals — Session I

Program Organizers: Christopher Marvel, Lehigh University; Andrew Frerichs, The NanoSteel Company

Monday AM
September 30, 2019

Room: B110
Location: Oregon Convention Center

Session Chairs: Christopher Marvel, Lehigh University; Jonathan Healy, Naval Surface Warfare Center - Carderock Division

8:40 AM Invited
Between Industry and Academia: *C. Austin Wade*[1]; [1]Thermo Fisher Scientific

9:00 AM Invited
What Do I Do Now? Assuming Technical Leadership Roles Immediately After Entering Industry: *Andrew Baker*[1]; [1]Boeing

9:20 AM Invited
My Transformation from Graduate Student to Assistant Professor: The Metastable States and the Energy Barriers: *Ashley Paz y Puente*[1]; [1]University of Cincinnati

9:40 AM Invited
Decision Making Strategies for Prospective Professors: *Zachary Cordero*[1]; [1]Rice University

10:00 AM Break

10:20 AM Invited
Dr. Liu's TKC Theory: Thermodynamics, Kinetics, and Crystallography: *Zi-Kui Liu*[1]; [1]Pennsylvania State University

11:00 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
September 30, 2019

Room: D139
Location: Oregon Convention Center

Session Chairs: Morsi Mahmoud, King Fahd University of Petroleum and Minerals (KFUPM); Jun Fukushima, Tohoku University

8:00 AM
Radio Frequency and Microwave Heating of Preceramic Polymers and its Application in Silicon Carbide Processing: *Nutan Patil*[1]; Miladin Radovic[1]; Mohammad Saed[2]; Micah Green[1]; [1]Texas A&M University; [2]Texas Tech University

8:20 AM
Effect of Pulsed Electric Current on Metastable Austenitic Steel: *Hye-Jin Jeong*[1]; Ju-Won Park[1]; Howook Choi[1]; Moon-Jo Kim[2]; Sung-Tae Hong[3]; Heung Nam Han[1]; [1]Seoul National Univ; [2]Korea Institute of Industrial Technology; [3]University of Ulsan

8:40 AM Invited
Electro-pulse and High Magnetic Field Annealing of Cold-Rolled NiFe: *Ian Baker*[1]; Patrice Chantrenne[2]; Si Chen[3]; Damien Fabrègue[2]; Xiaobin Guo[1]; Nour Hayek[1]; Gerard Ludtka[4]; Bart Murphy[4]; Rachel Osmundsen[1]; Yang Ren[3]; Ty Teodori[1]; Liang Wang[5]; Chao Yang[1]; [1]Dartmouth College; [2]INSA Lyon; [3]Argonne National Laboratory; [4]Beijing Institute of Technology; [5]Northern Illinois University; Beijing Institute of Technology

9:00 AM Invited
Microwave Effects in Heterogenous Materials: A Study on Catalysis: *Christina Wildfire*[1]; Dushyant Shekhawat[1]; Victor AbdelSayed[2]; Terence Musho[3]; [1]NETL; [2]Leidos, NETL; [3]WVU

9:30 AM Invited
Electric Current Annealing of Zircaloy Alloy and Associated Mechanisms: *Daudi Waryoba*[1]; Zahabul Islam[1]; Baoming Wang[2]; Aman Haque[1]; [1]Pennsylvania State Univ; [2]Massachusetts Institute of Technology (MIT)

10:00 AM Break

10:20 AM Invited
Surface-charge Mobility Theory: An Explanation for Certain "Microwave Effects": *Edward Ripley*[1]; [1]Y-12 National Security Complex

10:40 AM
Advanced In-Line Nanocrystallization of Amorphous Metal Ribbon (AMR) Alloys Through Mechanical and Electromagnetic Fields: *Kevin Byerly*[1]; Paul Ohodnicki[1]; Michael McHenry[2]; Michael Lanagan[3]; Dinesh Agrawal[3]; [1]National Energy Technology Laboratory; [2]Carnegie Mellon Universiity; [3]Penn State University

11:00 AM Invited
Effective Permittivity of Metal/Ceramic Composites and Microwave Heating Characteristics: *Noboru Yoshikawa*[1]; Sinya Ohgane[1]; Naoki Ohgane[1]; Takane Watanabe[1]; Sergey Komarov[1]; [1]Tohoku University

11:30 AM Invited
Locally Activated Solution Processing Would be Preferable Than General Hydrothermal/Solvothermal Processing Using Autoclaves: *Masahiro Yoshimura*[1]; [1]National Cheng Kung University

PSDK XIV: Phase Stability and Diffusion Kinetics — Gibbs: Ab Initio and CALPHAD Modeling

Program Organizers: Michael Gao, National Energy Technology Laboratory; Hans Seifert, Karlsruhe Institute of Technology; Zi-Kui Liu, Pennsylvania State University; Fan Zhang, CompuTherm LLC; Richard Otis, Jet Propulsion Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory

Monday AM
September 30, 2019

Room: E144
Location: Oregon Convention Center

Session Chairs: Michael Gao, National Energy Technology Lab; Ursula Kattner , National Institute of Standards and Technology

8:00 AM Keynote
From Phenomenon to Energy: *Patrice Turchi*[1]; [1]Formerly at Lawrence Livermore National Laboratory

8:40 AM Invited
Utilization of First Principles Results in the Development of CALPHAD Databases: Hai-Lin Chen[1]; Giancarlo Trimarchi[1]; Qing Chen[1]; *Paul Mason*[2]; [1]Thermo-Calc Software AB; [2]Thermo-Calc Software Inc.

9:00 AM Invited
Phase Stability in Refractory Metal Silicides: *John Perepezko*[1]; [1]University of Wisconsin - Madison

9:20 AM Invited
Effects of Extreme Chemical Complexity on the Fundamentals Properties of Multicomponent Concentrated Solid Solution and High Entropy Alloys: *G Malcolm Stocks*[1]; Sai Mu[1]; German Samolyuk[1]; [1]Oak Ridge National Laboratory

9:40 AM Invited
Short-Range Order Effects Related to Mechanical Properties in Concentrated Solid Solutions: *Mark Asta*[1]; [1]University of California, Berkeley

10:00 AM Break

10:20 AM Invited
Thermodynamics of High-Entropy Alloys: *Michael Gao*[1]; Zongrui Pei[1]; Mike Widom[2]; Jeffrey Hawk[1]; David Alman[1]; [1]National Energy Technology Laboratory; [2]Carnegie Mellon University

10:40 AM Invited
Bayesian Uncertainty Quantification and Information Fusion in CALPHAD-based Thermodynamic Modeling: *Raymundo Arroyave*[1]; Pejman Honarmandi[1]; Seyefe Fatheme Ghoreishi[1]; Thien Duong[1]; Douglas Allaire[1]; [1]Texas A&M University

11:00 AM Invited
CALPHAD Modeling of the Molar Volume of Co-base Superalloys: *Ursula Kattner*[1]; [1]National Institute of Standards and Technology

11:20 AM Invited
Ab Initio Modelling of Planar Defects in M23C6: *Marcel Sluiter*[1]; Maaouia Souissi[2]; Ryoji Sahara[2]; [1]Tu Delft; [2]National Institute for Materials Science

Substrate Protection for Corrosion Prevention — Session I

Program Organizers: Mary Lyn Lim, PPG Industries; Qixin Zhou, The University of Akron; Niamh Hosking, Ford Motor Company; Matthew Asmussen, Pacific Northwestern National Laboratory; Elissa Trueman, NSWC Carderock Division; Cortney Crane, Exponent Failure Analysis Associates; Stephen Raiman, Oak Ridge National Laboratory; Raul Rebak, GE Global Research

Monday AM
September 30, 2019

Room: B118
Location: Oregon Convention Center

Session Chairs: Mary Lyn Lim, PPG; Cortney Crane, Exponent Failure Analysis Associates; Qixin Zhou, The University of Akron

8:00 AM Invited
Characterization of Zinc Phosphate Coatings with Fast Kinetics Activators: *Mark Mcmillen*[1]; [1]PPG Industries

8:40 AM
A Corrosion Study of Light Metal Cylinder Head Material in Chloride Containing Engine Coolant Environment: *Anusha Chilukuri*[1]; Gaurav Argade[1]; Justin Perry[1]; Corey Trobaugh[1]; Randy Schafer[1]; Erica Raisor[1]; Jacob Steenhoek[1]; Glenia Pena Lugo[1]; [1]Cummins Inc.

9:00 AM
Comparative Correlation of Advanced Accelerated Corrosion Exposure Tests with Traditional Methods: Brian Smith[1]; *Mason Schloder*[1]; [1]Assured Testing Services

9:20 AM
Enhanced Coating Adhesion through a Nano-structuring Laser-interference Surface Treatment: *Adrian Sabau*[1]; Jiheon Jun[1]; [1]Oak Ridge National Laboratory

9:40 AM
Anti-corrosion Failure Mechanism Study of Waterborne Isocyanate-free Polyurethane Coatings on Steel Substrate: *Cheng Zhang*[1]; [1]University of Akron

10:00 AM Break

10:20 AM
Fluoride Salt Corrosion Resistance of Binder-free Chromium Carbide Layers on Cr Substrates.: *Kevin Chan*[1]; Preet Singh[1]; [1]Georgia Institute of Technology

10:40 AM
Environmentally Friendly Multilayer Coating for Carbon Steel Corrosion Prevention: *Fangming Xiang*[1]; David Hopkinson[1]; [1]National Energy Technology Laboratory

Surface Properties of Biomaterials — Novel Biomaterials, Devices, and Test Methods

Program Organizers: Ryan Bock, SINTX Technologies; Jason Langhorn, DePuy Synthes Joint Reconstruction; Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University; Mangal Roy, Indian Institute of Technology-Kharagpur; Venu Varanasi, University of Texas at Arlington

Monday AM
September 30, 2019

Room: C121
Location: Oregon Convention Center

Session Chairs: Ryan Bock, SINTX Technologies; Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University

8:00 AM Invited
Goodbye Hospitals Hello Implantable Nanosensors: *Thomas Webster*[1]; [1]Northeastern University

8:40 AM Invited
Creating a Clinically Relevant 3rd Body Abrasion Wear Test Protocol: *Jason Langhorn*[1]; Elizabeth Hippensreel[1]; Rebecca Shaheen[1]; Madison Miller[1]; Hannah Albert[1]; Noah Bonnheim[2]; Douglas Van Citters[2]; [1]DePuy Synthes Joint Reconstruction; [2]Dartmouth College

9:20 AM Invited
Biophysical Stimulation of Stem Cells on Biomaterials and in Biomicrofluidic Device: In Vitro and in Silico Studies: *Bikramjit Basu*[1]; [1]Indian Institute of Science

10:00 AM Break

10:20 AM Invited
Nanomechanical Measurements of Tissue Engineered Materials and Pharmacological Coatings: Praveena Manimunda[1]; Benjamin Stadnick[1]; *Douglas Stauffer*[1]; [1]Bruker Nano Inc.

11:00 AM
Zirconia Toughened Alumina Reinforced Ti6Al4V for Articulating Surfaces of Load-bearing Implants: *Jose Avila*[1]; Amit Bandyopadhyay[1]; Susmita Bose[1]; [1]Washington State University

11:20 AM Invited
Refined PEEK/Silicon Nitride Composite Resists Biofilm Formation: *Ryan Bock*[1]; Erin Jones[1]; Giuseppe Pezzotti[2]; B. Sonny Bal[1]; Bryan McEntire[1]; [1]SINTX Technologies; [2]Kyoto Institute of Technology

11:40 AM
Effects of Vitamin D3 Release from 3D Printed Calcium Phosphate Scaffolds on the Bone Remodeling Process: *Ashley Vu*[1]; Susmita Bose[1]; [1]Washington State University

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

Program Organizers: Kyle Brinkman, Clemson University; Kristina Lilova, University California Davis; Alexandra Navrotsky, University California Davis; Jake Amoroso, Savannah River National Laboratory; Fei Peng, Clemson University; Xingbo Liu, West Virginia University; Gustavo Costa , NASA; Xiaofeng Guo, Washington State University

Monday AM
September 30, 2019

Room: B119
Location: Oregon Convention Center

Session Chair: Kyle Brinkman, Clemson University

8:00 AM Introductory Comments

8:10 AM Invited
ACerS Navrotsky Award for Experimental Thermodynamics of Solids: A Novel Apparatus for Coulometric Titrations in Lithium Containing Systems: *Alexander Beutl*[1]; S. Fürtauer[1]; H. Flandorfer[1]; [1]University of Vienna

8:55 AM Invited
Novel Insight into Defect Behavior of Irradiated Materials: Combined Neutron Total Scattering and High Temperature Calorimetry Investigation: *Maik Lang*[1]; Eric O'Quinn[1]; Raul Palomares[1]; Cheng-Kai Chung[2]; Anna Shelyug[2]; Joerg Neuefeind[3]; Alexandra Navrotsky[2]; [1]University of Tennessee; [2]University of California, Davis; [3]Oak Ridge National Laboratory

9:25 AM Invited
Speciation and Stability of Uranium and Thorium in Hydrothermal Environments: *Hongwu Xu*[1]; Artaches Migdissov[1]; Hakim Boukhalfa[1]; Robert Roback[1]; [1]Los Alamos National Laboratory

9:55 AM Break

10:15 AM Invited
Formation of $PuSiO_4$: Lessons Coming from Chemical Analogues: *Nicolas Dacheux*[1]; Paul Estevenon[2]; Eleonore Welcomme[2]; Stephanie Szenknect[1]; Adel Mesbah[1]; Philippe Moisy[2]; Christophe Poinssot[2]; [1]University Montpellier; [2]CEA / Nuclear Energy Division / DMRC

10:45 AM
Pyrochlore Disordering under Extreme Conditions: *Alexandra Navrotsky*[1]; [1]University of California, Davis

11:05 AM
Monazite as a Waste Form for Actinides: From Synthesis to Long-term Behavior: *Nicolas Dacheux*[1]; Dawen Qin[1]; Clemence Gausse[1]; Adel Mesbah[1]; Nicolas Clavier[1]; Stéphanie Szenknect[1]; Renaud Podor[1]; [1]University Montpellier

Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications — Shape Memory Alloys, Bulk Metallic Glasses and Functionally Graded Materials

Program Organizers: Ali Yousefiani, Boeing Research And Technology; Troy Topping, California State University, Sacramento; Robert Dillon, NASA Jet Propulsion Laboratory; Linruo Zhao, National Research Council of Canada

Monday AM
September 30, 2019

Room: D140
Location: Oregon Convention Center

Session Chair: Robert Dillon, Jet Propulsion Laboratory

8:00 AM Invited
Effect of Thermal History on Mechanical and Wear Properties of Bulk Metallic Glass Spacecraft Components: *Punnathat Bordeenithikasem*[1]; Scott Roberts[1]; Robert Dillon[1]; Michael Sansoucie[2]; [1]NASA Jet Propulsion Laboratory; [2]NASA Marshall Space Flight Center

8:40 AM
Multi Length-scale Mechanical Property Measurements in Ti-based Bulk Metallic Glass-matrix Composites (BMG-MCs): New Insights on Deformation Mechanisms in the Glass Phase: *Ali Khosravani*[1]; Naresh Thadhani[1]; Surya Kalidindi[1]; [1]Georgia Institute of Technology

9:00 AM
Cold Work-Induced Strain Glass States in Ni49.5Ti50.5 SMA Plates: *Neha John*[1]; Choongyep Lee[1]; Nathan Ley[1]; Jesse Smith[1]; Robert Wheeler[1]; Anit Giri[2]; Marcus Young[1]; [1]University of North Texas; [2]Army Research Laboratory

9:20 AM
Effects of Pd Addition to High Strength NiTiHf Shape Memory Alloys: Guher Pelin Toker[1]; *Soheil Saedi*[2]; Dipak Banerjee[2]; Haluk Karaca[1]; [1]University of Kentucky; [2], University of Arkansas at Little Rock

9:40 AM
Damping Capacity of Ultra-high Strength NiTiHfPd Alloys: *Guher Pelin Toker*[1]; Soheil Saedi[2]; Haluk Karaca[1]; [1]University of Kentucky; [2]University of Arkansas at Little Rock

10:00 AM Break

10:20 AM
Nanoindentation Measurements of Crystal Orientation Anisotropy in Elastic and Plastic Properties of Ti-Pt-Ni-Hf Shape Memory Alloys: *Ali Khosravani*[1]; Manu Mohan[2]; Dipankar Banerjee[2]; Surya Kalidindi[1]; [1]Georgia Institute of Technology; [2]Indian Institute of Science

10:40 AM
Macroscopic Ferroelastic Response of Processing-Induced Strain Glass Alloys under Tension, Compression, and Bending: *Robert Wheeler*[1]; Jessica Rider[1]; Nathan Ley[1]; Jesse Smith[1]; Anit Giri[2]; Marcus Young[1]; [1]University of North Texas; [2]Army Research Laboratory

11:00 AM
Location-Specific Mechanical Property Enhancement of Atomically Ordered Fe-Co-V Soft Magnetic Alloys: *Jeffrey Rodelas*[1]; Donald Susan[1]; Andrew Kustas[1]; Alexander Barr[1]; Matthew Vieira[1]; [1]Sandia National Laboratories

11:20 AM
Solid Phase Processing of Copper/Graphene Alloys with Ultra-high Conductivity: *Keerti Kappagantula*[1]; Xiao Li[1]; Chen Zhou[2]; Hongliang Wang[2]; James Schroth[2]; Glenn Grant[1]; [1]Pacific Northwest National Laboratory; [2]General Motors

Undergraduate Global University — What to Expect Post Bachelor's Degree I

Program Organizers: Kelley Wilkerson, Missouri University of Science and Technology; Dana Goski, Allied Mineral Products; James Hemrick, Reno Refractories Inc.; Eva Hemmer, University of Ottawa

Monday AM
September 30, 2019

Room: A103
Location: Oregon Convention Center

Session Chair: Kelley Wilkerson, Missouri University of Science and Technology

8:00 AM Introductory Comments

8:05 AM Invited
A Comparison of Academic Versus Industrial Research Experiences: *James Hemrick*[1]; [1]Reno Refractories, Inc.

8:25 AM
Career Options in Refractories and Related Industries: *Dana Goski*[1]; [1]Allied Mineral Products Inc

8:45 AM
Engineering Careers in Manufacturing and How They Can Improve the World: *Keith DeCarlo*[1]; [1]Blasch Precision Ceramics

9:05 AM
Engineering Graduate Opportunities at Alfred University: *Gabrielle Gaustad*[1]; William Carty[1]; [1]Alfred University

9:25 AM Invited
Graduate Opportunities at the Colorado School of Mines: *Geoff Brennecka*[1]; [1]Colorado School of Mines

9:45 AM
High Temperature Materials: Opportunities in Industry and Academia: *Stefan Schafföner*[1]; Lesley Frame[1]; Bryan Huey[1]; [1]University of Connecticut

10:05 AM Break

10:25 AM Invited
Industrial Support for Undergraduate Research in the PSMRC: *Ronald OMalley*[1]; [1]Missouri University of Science and Technology

10:45 AM
Life at a National Laboratory in the Pacific Northwest: *Charmayne Lonergan*[1]; [1]Pacific Northwest National Laboratory

11:05 AM
Missouri University of Science and Technology: Graduate School Opportunities: *Greg Hilmas*[1]; Kelley Wilkerson[1]; [1]Missouri University of Science and Technology

11:25 AM
My Unexpected Path from Ceramic Engineering to Nuclear Waste Immobilization: *Fabienne Johnson*[1]; [1]Savannah River National Laboratory

11th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Novel Materials Processing Paradigm II

Program Organizers: Surojit Gupta, University of North Dakota; Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technololgy; John Wolodko, University of Alberta; Christopher Taylor, DNV GL; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin; 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
September 30, 2019

Room: Portland Ballroom 255
Location: Oregon Convention Center

Session Chairs: Manoj Mahapatra, University of Alabama; John Wolodko, University of Alberta; Dipankar Ghosh, Old Dominion University

2:00 PM Invited
Electrochemical Technique for Materials Processing and Manufacturing: *Manoj Mahapatra*[1]; Mark King[1]; [1]University of Alabama at Birmingham

2:20 PM Invited
Cathode, Anode and Electrolyte for Non-flammable Sodium-ion Cells: *Palani Balaya*[1]; [1]National University of Singapore

2:40 PM
A Preliminary Review and Classification of Environmental Life Cycle Impactsfor Various Materials: *John Wolodko*[1]; Ehsan Vaziri Yeganeh[1]; [1]University of Alberta

3:00 PM Invited
Development of Ice-templated Sintered Metal Oxides with Directional Porosity and Understanding Structure-mechanical Property Relationships: *Dipankar Ghosh*[1]; Rohan Parai[1]; Sashanka Akurati[1]; Justine Marin[1]; [1]Old Dominion University

3:20 PM Break

3:40 PM Invited
Development of Low Thermal Expansion Cordierite Porcelain Cook Wares: *Lalit Sharma*[1]; Kali Singh[1]; [1]CSIR-Central Glass & Ceramic Research Institute

4:00 PM
Conductivity Properties of Mg-Al Layer Double Hydroxides: *Keiichiro Maegawa*[1]; Qiaxian Johnson[2]; Mihaela Jitianu[2]; Atsunori Matsuda[1]; Andrei Jitianu[3]; [1]Toyohashi University of Technology; [2]William Paterson University; [3]Lehman College, City University of New York

4:20 PM
Fabrication and Characterization of Metakaolin-based Geopolymers with and Battery and Construction and Demolition (C&D) Waste Content for Potential Shielding Applications: *Raul Florez*[1]; Deiber Riascos[2]; Carlos Castano[1]; Henry Colorado[2]; [1]Missouri University of Science and Technology; [2]Universidad de Antioquia

4:40 PM
Optimization of Torrefaction Parameters for High Energetic Yields: *Jamiu Odusote*[1]; Adekunle Adeleke[1]; Olumuyiwa Lasode[1]; M Malathi[2]; Dayanand Paswan[3]; [1]University of Ilorin; [2] CSIR-National Metallurgical Laboratory; [3]CSIR-National Metallurgical Laboratory

5:00 PM Invited
Fractal Nature Bridging the Gap within the Space Scale Nano-microstructures-Meso-mega Sizes: *Vojislav Mitic*[1]; Goran Lazovic[2]; Tsong Perng[3]; Dusan Milosevic[4]; Hans Fecht[5]; Branislav Vlahovic[6]; [1]University Nis, Fac. Electronic Engineering, ITS. S.A.S.A; [2]Faculty of Mechanical Engineering University of Belgrade; [3]National Tsing Hua University; [4]Faculty of Electronic Engineering University Nis; [5]University Ulm; [6]NCCU, USA

5:20 PM Invited
From Flash Sintering to Water-assisted Flash Sintering and Beyond: Energy and Cost-Saving Materials Processing Technologies: *Jian Luo*[1]; [1]University of California, San Diego

ACerS Richard M. Fulrath Award Session

Program Organizer: Jonathan Salem, NASA Glenn Research Center

Monday PM
September 30, 2019

Room: Portland Ballroom 253
Location: Oregon Convention Center

Session Chair: Jonathan Salem, NASA Glenn Research Center

2:00 PM Invited
Engineering Cellular Ceramics with Modulated Pore Configurations: *Manabu Fukushima*[1]; [1]National Institute of Advanced Industrial Science and Technology

2:40 PM Invited
Fabrication and Characterization of Nanoscale Dielectrics for the Design of Advanced Ceramic Capacitors: *Keigo Suzuki*[1]; [1]Murata Manufacturing Co., Ltd.

3:00 PM Invited
Piezoelectric Thin Film Processing, PiezoMEMS Devices, and an Overview of PRIGM, SHRIMP, & AMEBA Programs: *Ronald Polcawich*[1]; [1]Defense Advanced Research Projects Agency (DARPA)

3:20 PM Break

3:40 PM Invited
Dielectric Material Design and Lifetime Prediction for Highly Reliable MLCCs: *Koichiro Morita*[1]; [1]Taiyo Yuden Co., Ltd.

4:00 PM Invited
Engineered Ceramic Materials for Energy Storage: *Vilas Pol*[1]; [1]Purdue University

Activating Allies: Navigating the Intersectional Landscape of Diversity & Inclusion — Abolishing the "Other" - How Intersectionality Challenges Our Current Approaches to Inclusion of People of Minority Identity

Program Organizers: Thomas Reeve, Lawrence Livermore National Laboratory; Matthew Korey, Purdue University

Monday PM
September 30, 2019

Room: A104
Location: Oregon Convention Center

Session Chairs: Thomas Reeve, Lawrence Livermore National Laboratory; Matthew Korey, Purdue University

2:00 PM Introductory Comments

2:10 PM Invited
Ally, Advocate, Accomplice: How both Knowledge and Action are Vital to Creating Inclusivity within Science: *Decatur Foster*[1]; [1]Portland State University

2:40 PM Question and Answer Period

2:45 PM Invited
Way Beyond the Bird-Bee Binary: Why Diversity Can Be an Uncomfortable Topic, Who Needs to Start the Conversation, and How to Do It Right: *K. Cunningham*[1]; [1]ATI Specialty Alloys & Components

3:15 PM Question and Answer Period

3:20 PM Break

3:50 PM Invited
Building Sustainable Partnerships between Historically Black Colleges and Universities (HBCUs) and Majority, Research-Intensive Universities: *Shaik Jeelani*[1]; Mahesh Hosur[2]; Melissa Reeves[1]; Michael Curry[1]; Inez Hua[3]; Carol Handwerker[3]; [1]Tuskegee University; [2]Texas A&M University-Kingsville; [3]Purdue University

4:20 PM Question and Answer Period

Additive Manufacturing Education — Session II

Program Organizers: Somayeh Pasebani, Oregon State University; Hang Yu, Virginia Polytechnic Institute and State University; Amy Elliott, Oak Ridge National Laboratory

Monday PM
September 30, 2019

Room: B111
Location: Oregon Convention Center

Session Chair: Somayeh Pasebani, Oregon State University

2:00 PM
Additive Manufacturing in Making Powder Metallurgy Filters – Student Experiences in Manufacturing Laboratory: *Serdar Tumkor*[1]; Jonathan Holman[1]; Tanner Badoud[1]; [1]University of Pittsburgh

2:20 PM
Developing an Improved Approach for Teaching Additive Manufacturing: *Bandar AlMangour*; [1]

2:40 PM
Free-form Additive Manufacturing Lab: *Craig Johnson*[1]; Charles Pringle[1]; John Choi[1]; [1]Central Washington University

Additive Manufacturing of Glass, Ceramics and Composites — Additive Manufacturing of Glass, Ceramics and Composites II

Program Organizers: Tobias Schaedler, Hrl Laboratories Llc; Matthew Dickerson, Air Force Research Laboratory; Rebecca Dylla-Spears, Lawrence Livermore National Laboratory; Chang-Jun Bae, Korea Institute of Materials Science (KIMS)

Monday PM
September 30, 2019

Room: B113
Location: Oregon Convention Center

Session Chair: Chang-Jun Bae, Korea Institute Of Materials Science (KIMS)

2:00 PM Invited
Stereolithographic Additive Manufacturing of Ceramic Dendrites Solid Electrolyte: *Soshu Kirihara*[1]; [1]Osaka University

2:30 PM
Multi-component Polycarbosilane Systems for the Additive Manufacturing of Polymer-derived Ceramics: *Matthew Dickerson*[1]; Luke Baldwin[2]; Lisa Rueschhoff[2]; Hilmar Koerner[2]; John Bowen[2]; Connor Wyckoff[2]; Kara Martin[2]; [1]Air Force Research Laboratory; [2]US Air Force

2:50 PM
Influence of Layer Thickness and Print Orientation on 3D Printed Polymer-derived Ceramics: *Stephan Brinckmann*[1]; Carl Frick[1]; Ray Fertig[1]; [1]University of Wyoming

3:10 PM
3D Printed High Temperature Ceramic Matrix Composites: *Mark O'Masta*[1]; Zak Eckel[1]; Kayleigh Porter[1]; Phuong Bui[1]; Ekaterina Stonkevitch[1]; Tobias Schaedler[1]; [1]HRL Laboratories, LLC

3:30 PM Break

3:50 PM
Direct Ink Writing of Polymer-derived Ceramic Composites: *Brett Compton*[1]; [1]University of Tennessee

4:10 PM
Additive Manufacturing of Ductile, Ultra-Strong Polymer-derived Nano-ceramics: Jens Bauer[1]; Cameron Crook[1]; *Anna Guell Izard*[1]; Zak Eckel[2]; Tobias Schaedler[2]; Lorenzo Valdevit[1]; [1]University of California, Irvine; [2]HRL Laboratories Llc

4:30 PM
Additive Manufacturing of Ceramic Matrix Composite Microlattices: *Raphael Thiraux*[1]; Lorenzo Valdevit[1]; [1]University of California, Irvine

4:50 PM
Impact of Process Control on Product Quality by Ceramic Robocasting Technique: Zhaolong Zhang[1]; *Richard Sisson*[1]; Jianyu Liang[1]; [1]Worcester Polytechnic Institute

Additive Manufacturing of Metals: Microstructure and Material Properties of Nickel-based Alloys — Characterization of Microstructure of AM Ni-based Alloys

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

Monday PM
September 30, 2019

Room: B117
Location: Oregon Convention Center

Session Chair: Ulf Ackelid, Freemelt Company

2:00 PM
Combining In-Situ/Ex-Situ Characterization and Solidification Modeling to Understand Microstructure Selection in Additively Manufactured Ni-based Alloys: *Jonah Klemm-Toole*[1]; Alec Saville[1]; C. Becker[1]; Benjamin Ellyson[1]; Yaofeng Guo[1]; Chloe Johnson[1]; Brian Milligan[1]; Andrew Polonsky[2]; Kira Pusch[2]; Kester Clarke[1]; Damien Tourret[3]; Niranjan Parab[4]; Kamel Fezzaa[4]; Tao Sun[4]; Tresa Pollock[2]; Amy Clarke[1]; [1]Colorado School of Mines; [2]University of California, Santa Barbara; [3]IMDEA Materials Institute; [4]Advanced Photon Source

2:20 PM
Fluid Dynamics Effects on Microstructure Prediction for the Single-track Laser Additive Manufacturing Process: *Adrian Sabau*[1]; Lang Yuang[2]; Narendran Raghavan[1]; John Turner[1]; Vipul Gupta[3]; [1]Oak Ridge National Laboratory; [2]University South Carolina; [3]General Electric Global Research Center

2:40 PM
Effect of Post-printing Heat Treatment on the Microstructure, Hardness and Phase Formation in Laser Powder Bed Fusion Inconel 718 Cuboids: *Amir Mostafaei*[1]; Runbo Jiang[1]; Joseph Pauza[1]; Scott Santoro[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

3:00 PM
Crystallographic Characterization of Nickel-based Alloys by Optical Microscopy: *Mallory Wittwer*[1]; Ekta Jain[1]; Yeoh Yong-Chen[1]; Bernard Gaskey[1]; Matteo Seita[1]; [1]Nanyang Technological University (NTU)

3:20 PM Break

3:40 PM
Experimental Characterization and Modeling of Solidification Cracking in Gamma-prime Strengthened Ni-based Superalloys: *Colleen Hilla*[1]; Michael Mills[1]; Wei Zhang[1]; Andrew Wessman[2]; Hyeyun Song[3]; Alber Sadek[3]; [1]Ohio State University; [2]GE Additive; [3]EWI

4:00 PM
Microstructure and Mechanical Properties Characterization of Crack-free Hastelloy X Fabricated by Laser Powder Bed Fusion: *Oscar Sanchez-Mata*[1]; Xianglong Wang[1]; Jose Alberto Muñiz-Lerma[1]; Mohammad Attarian Shandiz[1]; Sila Atabay[1]; Mathieu Brochu[1]; [1]McGill University

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

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

Monday PM
September 30, 2019

Room: B115
Location: Oregon Convention Center

Session Chairs: Zhi Wang, South China University of Technology; Prashanth Konda Gokuldoss, Tallinn University of Technology

2:00 PM Invited
Additive Manufacturing: Precipitation Hardening of Alloys: *Prashanth Konda Gokuldoss*[1]; [1]Tallinn University of Technology

2:30 PM
Laser Powder Bed Fusion of Aluminium Copper Alloys: *Amy Nommeots-Nomm*[1]; S Tumulu[1]; Mathieu Brochu[1]; [1]McGill University

2:50 PM
Microstructural Characterization of an Additively Manufactured AL-FE-SI-V Alloy: *Terry Holesinger*[1]; Matthew Schneider[1]; Matthew Janish[1]; Mark Ortega[1]; Michael Brand[1]; Colt Montgomery[1]; Thomas Lienert[2]; [1]Los Alamos National Laboratory; [2]T.J. Lienert Consulting, LLC

3:10 PM
Relationship between Microstructure and Laser Powder Bed Fusion Parameters in Al-6Zn-2Mg and Al-6Zn-2Mg-1(Sc+Zr) Alloys: *Le Zhou*[1]; Sharon Park[1]; Brandon McWilliams[2]; Kyu Cho[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]US Army Research Laboratory

3:30 PM Break

3:50 PM
Using Nanofunctionalization to Additively Manufacture High Strength Aluminum: *Mark O'Masta*[1]; John Martin[1]; Brennan Yahata[1]; Julie Miller[1]; Jacob Hundley[1]; Tobias Schaedler[1]; [1]HRL Laboratories

4:10 PM
Additive Manufacturing of Aluminum Matrix Composites: *William Harrigan*[1]; Yuzheng Zhang[1]; [1]Gamma Alloys

4:30 PM
In-situ Alloying of Aluminium Based Composites Reinforced by Multi-walled Carbon Nanotubes Using Selective Laser Melting: Process and Microstructure: *Nesma Aboulkhair*[1]; Marco Simonelli[1]; Ehab Salama[2]; Graham Rance[1]; Nigel Neate[1]; Christopher Tuck[1]; Amal Esawi[2]; Richard Hague[1]; [1]University of Nottingham; [2]The American University in Cairo

Additive Manufacturing: Effective Production, Characterization, and Recycling of Powder Materials — Characterization

Program Organizers: James Paramore, U.S. Army Research Laboratory; Ulf Ackelid, Freemelt AB; Sudarsanam Babu, University of Tennessee, Knoxville; Brady Butler, U.S. Army Research Laboratory; Zhigang Fang, University of Utah; Ola Harrysson, North Carolina State University; Don Li, Arconic Titanium & Engineered Products; Andrzej Wojcieszynski, ATI Specialty Materials

Monday PM
September 30, 2019

Room: B116
Location: Oregon Convention Center

Session Chairs: Ulf Ackelid, Freemelt AB; Sudarsanam Babu, The University of Tennessee, Knoxville

2:00 PM Invited
Synchrotron X-ray CT of AM Feedstock Metal Powder: A Validation of Metallographic Porosity Measurements.: *Timothy Prost*[1]; Chih-Pin Chuang[2]; Dileep Singh[2]; Emma White[1]; Iver Anderson[1]; [1]Ames Laboratory; [2]Argonne National Laboratory

2:30 PM
Understanding Surface Area Measurement for Improved Powder Characterization: *Jack Saad*[1]; [1]Micromeritics

2:50 PM
Characterization of Gas Atomized Aluminum Alloy Powder for Additive Manufacturing Applications: *Kyle Tsaknopoulos*[1]; Victor Champagne[2]; Danielle Cote[1]; [1]Worcester Polytechnic Institute; [2]Army Research Lab

3:10 PM
Surface Area as a Powder Morphology Probe: *Dave van der Wiel*[1]; [1]NSL Analytical

3:30 PM Break

3:50 PM Invited
Powder Specification Needs for Steels in the LPBF Process: *Elias Jelis*[1]; Michael Hespos[1]; Matthew Clemente[1]; Ryan Carpenter[1]; [1]U.S. Army ARDEC-Picatinny Arsenal

4:20 PM
Characterization of Nickel-base Superalloy MAR-M247 Powders by Synchrotron X-ray Computed Tomography: *Lianghua Xiong*[1]; Andrew Chuang[1]; Peter Kenesei[1]; Jonathan Almer[1]; Dileep Singh[1]; [1]Argonne National Laboratory

4:40 PM
Understanding Powder Morphology and Its Effect on Flowability through Computer Vision and Machine Learning In Additive Manufacturing: *Srujana Rao Yarasi*[1]; Andrew Kitahara[1]; Anthony Rollett[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

5:00 PM
Potentials and Risks in Hybrid Manufacturing: Miriam Huber[1]; Marie Jurisch[2]; Sebastian Matthes[1]; *Felix Gemse*[1]; [1]ifw Jena; [2]Fraunhofer IFAM

5:20 PM
Determination of Viscosity of Metal Melts by High Temperature Rheometry: Christopher Giehl[1]; Mario Kleindienst[1]; *Daniela Ehgartner*[1]; [1]Anton Paar

Additive Manufacturing: In-situ Process Monitoring and Control — Miscellaneous Methods

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

Monday PM
September 30, 2019

Room: B112
Location: Oregon Convention Center

Session Chair: Andrzej Wojcieszynski, ATI Powder Metals

2:00 PM
Correlation of Porosity Defects with In-situ Pyrometry in AM 316L Stainless Steel: *Thomas Ivanoff*[1]; John Mitchell[1]; Jonathan Madison[1]; Joshua Koepke[1]; Daryl Dagel[1]; Bradley Jared[1]; [1]Sandia National Laboratories

2:20 PM
Defect Detection in Additively Manufactured 304L and Ti-6-4 via Low Frame Rate Pyrometry: *Tom Stockman*[1]; John Carpenter[1]; Brian Patterson[1]; [1]Los Alamos National Laboratory

2:40 PM
Direct Process Feedback in Extrusion-based Additive Manufacturing Using Learning Control: *Ashley Armstrong*[1]; Andrew Alleyne[1]; Amy Wagoner Johnson[1]; [1]University of Illinois Urbana-Champaign

3:00 PM
Implementation of Nonlinear Ultrasonic Techniques for In-situ Monitoring of Defect Formation in Additively Manufactured Inconel 718: *Anna Hayes*[1]; Susana Castillo[1]; Umar Amjad[1]; Tribikram Kundu[1]; Gregory Colvin[2]; BG Potter[1]; Krishna Muralidharan[1]; [1]The University of Arizona; [2]Honeywell Aerospace

3:20 PM Break

3:40 PM
In-situ Cooling Dynamics of Ti-6Al-4V Additive Manufacturing and Its Relation to Microstructure and Properties: *Anthony Fong*[1]; Vivek Thampy[1]; Ottman Tertuliano[2]; Kevin Stone[1]; Johanna Weker[1]; Matthew Kramer[3]; Ryan Ott[3]; Wei Cai[2]; Christopher Tassone[1]; [1]SLAC National Accelerator Laboratory; [2]Stanford University; [3]Ames Laboratory

4:00 PM
Real-time Layer-by-layer Ultrasonic Peening Treatment during Additive Manufacturing to Improve Fatigue Properties of 17-4 SS Alloy: *Rasool Sebdani*[1]; Ajit Achuthan[1]; [1]Clarkson University

4:20 PM
Selective Laser Melting Monitored by Acoustic Emission and Tomography Characterization: *Rita Drissi Daoudi*[1]; [1]EPFL

4:40 PM
Effect of Powder Bed Fusion Processing Parameters on Optical Emission during Single-track Deposits and the Implications for Quality Assurance and Control: *Christopher Stutzman*[1]; Abdalla Nassar[1]; [1]The Pennsylvania State University

Additive Manufacturing: Solid-state and Other Nonbeam-based Technologies for the Manufacturing of Metallic Parts — AM by Methods Requiring a Sinter Step

Program Organizers: Olaf Andersen, Fraunhofer Society; J. Brian Jordon, University of Alabama; Orlando Rios, Oak Ridge National Laboratory; Paul Allison, University of Alabama; Mark Norfolk, Fabrisonic LLC; Luke Brewer, University of Alabama

Monday PM
September 30, 2019

Room: B114
Location: Oregon Convention Center

Session Chairs: J. Brian Jordon, University of Alabama; Markus Chmielus, University of Pittsburgh

2:00 PM Invited
Steel Parts Produced by Material Extrusion Additive Manufacturing, Solvent Debinding and Sintering: *Joamin Gonzalez-Gutierrez*[1]; Yvonne Thompson[2]; Santiago Cano[1]; Peter Felfer[2]; Christian Kukla[1]; Clemens Holzer[1]; [1]Montanuniversitaet Leoben; [2]Friedrich-Alexander-Universitaet Erlangen Nuernberg

2:30 PM
Metal-loaded Polymer Filament for FDM: *Stephanie Choquette*[1]; Wesley Everhart[1]; [1]Kansas City National Security Campus

2:50 PM
Metal Fused Filament Fabrication (MF3) 3D Printing with Powder-Polymer Mixtures: Paramjot Singh[1]; Kavish Sudan[1]; *Kunal Kate*[1]; Sundar Atre[1]; Vamsi Balla[1]; [1]University of Louisville

3:10 PM Invited
Sintering and Infiltration of Binder Jet Printed Parts for Applications in Tooling and Energy: *Amy Elliott*[1]; [1]Oak Ridge National Laboratory

3:30 PM Break

3:50 PM
3D Screen Printing of Medical Parts: Thomas Studnitzky[1]; Kay Reuter[1]; *Olaf Andersen*[1]; Guido Stiebritz[2]; Stefan Wirth[3]; [1]Fraunhofer Society; [2]H.C. Starck Hermsdorf GmbH; [3]Siemens Healthineers

4:10 PM Invited
The Effect of Printing and Post-processing on Microstructure and Properties of Binder Jet 3D Printed Materials: Runbo Jiang[1]; Katerina Kimes[1]; Pierangeli Rodriguez De Vecchis[1]; Amir Mostafaei[2]; *Markus Chmielus*[1]; [1]University of Pittsburgh; [2]Carnegie Mellon University

4:30 PM
Densification Kinetics in Binder jet 3D Printed Co-Cr Biomaterials: *Amir Mostafaei*[1]; Sidi Feng[1]; Nihal Sivakumar[1]; Runbo Jiang[2]; Pierangeli Rodriguez De Vecchis[2]; Markus Chmielus[2]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]University of Pittsburgh

4:50 PM
On the Sintering Behavior of Binder Jet Additive Manufactured 316L Stainless Steel Components: *Saereh Mirzababaei*[1]; Sriram Manoharan[1]; Brian Paul[1]; Somayeh Pasebani[1]; [1]Oregon State University

5:10 PM
Packing Defects and Microstructure Evolution during Sintering of Binder–jet Printed 625 Nickel Based Superalloy: Chuyuan Zheng[1]; Amir Mostafaei[2]; Pierangeli Rodriguez De Vecchis[1]; *Ian Nettleship*[1]; Markus Chmielus[1]; [1]University of Pittsburgh; [2]Carnegie Mellon University

Advanced Biomaterials for Biomedical Implants and Biosensing Devices — Session II

Program Organizers: Tolou Shokuhfar, University of Illinois at Chicago; Sahar Vahabzadeh, Northern Illinois University

Monday PM
September 30, 2019

Room: C120
Location: Oregon Convention Center

Session Chairs: Tolou Shokuhfar, University of Illinois at Chicago; Sahar Vahabzadeh, Northern Illinois University

2:00 PM
Improving the Biocompability and Corrosion Resistance of AZ31 Mg Alloy for Biomedical Applications: *Adedotun Adetunla*[1]; Esther Akinlabi[1]; [1]University of Johannesburg

2:20 PM
Extraction,Characterization and Properties of Chitin and Chitosan of Nigerian Origin: *Chiosa Odili*[1]; Oluwashinor Gbenebor[1]; Olatunde Sekunowo[1]; Oluropo Adeosun[1]; [1]University of Lagos

2:40 PM
From Porous to Dense Nanostructured ß-Ti Alloys through High-pressure Torsion: Advanced Characterization: *Conrado Afonso*[1]; Angelica Amigó[2]; Vladimir Stolyarov[3]; Raúl Arenal[4]; Vicente Amigó[2]; [1]Universidade Federal de São Carlos (UFSCar); [2]Universitat Politècnica de València (UPV); [3]Moscow Engineering Physics Institute ; [4]Universidad de Zaragoza

3:00 PM
Zinc Doping Controlled In Vivo Degradability of Magnesium Phosphate Bioceramic: *Kaushik Sarkar*[1]; Vinod Kumar[2]; Samit Nandi[2]; Mangal Roy[1]; [1]Indian Institute of Technology; [2]West Bengal University of Animal & Fishery Sciences

3:20 PM Break

3:40 PM
Plasma sprayed In-situ Formed TiB-TiN Reinforced Ti6Al4V Alloy Composite Coatings: Tribocorrosion Evaluation: Akrity Anand[1]; Mitun Das[1]; Biswanath Kundu[1]; Subhadip Bodhak[1]; Gangadharan S[1]; *Vamsi Balla*[2]; [1]CSIR-Central Glass & Ceramic Research Institute; [2]University of Louisville

4:00 PM
Effect of Heat Treatment and Forging on In Vitro Corrosion and Cytocompatibility of Mg-Zr-Sr-Ce Alloy: *Sourav Dutta*[1]; Sanjay Gupta[1]; Mangal Roy[1]; [1]Indian Institute of Technology Kharagpur

Advanced Materials for Harsh Environments — Session II

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

Monday PM
September 30, 2019

Room: C126
Location: Oregon Convention Center

Session Chairs: Hang Yu, Virginia Polytechnic Institute and State University; Gary Pickrell, Virginia Tech; Navin Manjooran, Solve Technology and Research, Inc.

2:00 PM Keynote
Interface Corrosion of Glass Seals with Crofer 22 APU/ YSZ for the Planar Solid Oxide Fuel Cells: *Gurbinder Kaur*

2:40 PM
High-temperature Oxidation of Ni-based Alloys in CO_2 Containing Combustion Impurities: *Richard Oleksak*[1]; Joseph Tylczak[1]; Gordon Holcomb[1]; Ömer Dogan[1]; [1]National Energy Technology Laboratory

3:00 PM
Effect of Welds and Crevices on Oxidation in High Temperature Supercritical Carbon Dioxide: *Florent Bocher*[1]; [1]Southwest Research Institute

3:20 PM
Enhancing the Tribocorrosion Resistance of Al and Mg Alloys via Microstructure Design: *Wenjun Cai*[1]; [1]Virginia Tech

3:40 PM Break

4:00 PM
Electroceramic-based Passive Wireless Sensors for Monitoring High Temperature Systems: *Kavin Sivaneri Varadharajan Idhaiam*[1]; Lawrence Redinger[1]; Katarzyna Sabolsky[1]; Edward Sabolsky[1]; Konstantinos Sierros[1]; Harish Palakurthi[1]; Daryl Reynolds[1]; [1]West Virginia University

4:20 PM
Early Stage Oxidation of UNS N06230 and UNS N07214 in Dry and Humid Conditions: *Nicholas Ury*[1]; Annette Wagner[1]; Vinay Deodeshmukh[2]; Vilupanur Ravi[1]; [1]Cal Poly Pomona; [2]Haynes International

4:40 PM
Effect of Chromium on Corrosion Resistance of Stainless Steels in Supercritical CO2 Direct Power Cycle Environments: *Reyixiati Repukaiti*[1]; Lucas Teeter[1]; Margaret Ziomek-Moroz[1]; Omer Dogan[1]; Richard Oleksak[1]; Randal Thomas[1]; John Baltrus[1]; Julie Tucker[2]; [1]National Energy Technology Laboratory; [2]Oregon State University

5:00 PM
Dielectric, Electromechanical Properties and Photo-catalytic Activity of Na0.5Bi0.5TiO3–BaTiO3-K0.5Bi0.5TiO3 Lead-free Ceramics: *Mohammed Mesrar*[1]; [1]Signaux Systèmes et Composants (Fés (Maroc)

5:20 PM Concluding Comments

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

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

Monday PM
September 30, 2019

Room: A105
Location: Oregon Convention Center

Session Chairs: Danilo Suvorov, Jožef Stefan Institute; Rick Ubic, Boise State University

2:00 PM Invited
Upside-down Piezoelectric Composites without Sintering - Towards Sensor Applications: Tuomo Siponkoski[1]; Mikko Nelo[1]; Heli Jantunen[1]; *Jari Juuti*[1]; [1]University of Oulu

2:20 PM Invited
New Ferroelectric Perovskite Ceramics with Low Losses for Applications in Microwave Antennas: *Claire Le Paven*[1]; Mohamad Haydoura[1]; Ratiba Benzerga[1]; Vincent Laur[2]; Florent Marlec[1]; Laurent Le Gendre[1]; Yang Bai[3]; Heli Jantunen; Alexis Chevalier[2]; Ala Sharaiha[1]; [1]University of Rennes, IETR; [2]University of Brest, LABSTICC; [3]University of Oulu, MRU

2:40 PM Invited
Compositional Design of LTCC Materials with Different Dielectric Permittivities for Microwave Applications: *J.J. Bian*[1]; [1]Shanghai University

3:00 PM Invited
Perspectives on Dielectric and Magnetic Ceramic Materials for Use in 5G Wireless Communication: *Michael Hill*[1]; David Cruickshank[2]; Iain MacFarlane[2]; Dave Firor[1]; [1]Skyworks RF Ceramics; [2]Wireless Communications Consultant

3:20 PM Break

3:40 PM Invited
High k Microwave Dielectric Ceramics Suitable for Low Temperature Co-fired Ceramics Technology: *Di Zhou*[1]; [1]Xi'an Jiaotong University

4:00 PM
Microwave Dielectric Materials Fabricated by Cold Sintering Process: *Jing Guo*[1]; Hong Wang[2]; Clive Randall[3]; [1]Xi'an Jiaotong University, Pennsylvania State University; [2]Southern University of Science and Technology; [3]Pennsylvania State University

4:20 PM
In situ Characterization during Crystallization of Highly Textured $Sr_xBa_{1-x}Nb_2O_6$ Thin Films from Aqueous Chemical Solution Deposition: *Anders Blichfeld*[1]; Kristine Bakken[1]; Donald Evans[1]; Julia Glaum[1]; Tor Grande[1]; Mari-Ann Einarsrud[1]; [1]NTNU Norwegian University of Science and Technology

4:40 PM Invited
State-of–the-art Microwave Measurements of Materials: *Nathan Orloff*[1]; [1]National Institute of Standards and Technology

5:00 PM
Processing Effects on Dielectrics Produced via Aerosol Deposition: *Eric Patterson*[1]; Scooter Johnson[1]; Edward Gorzkowski[1]; [1]U.S. Naval Research Lab

5:20 PM
The Interplay of Electronic and Magnetic Functionalities in Entropy-stabilized Oxides: *Peter Meisenheimer*[1]; Sieun Chae[1]; Emmanouil Kioupakis[1]; John Heron[1]; [1]University of Michigan

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

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

Monday PM
September 30, 2019

Room: C125
Location: Oregon Convention Center

Session Chair: Frank Goodwin, ILZRO

2:00 PM Invited
Investigation on the Coating Adhesion of Galvanized AHSS Treated by Oxidation-reduction Process: *Xinyan Jin*[1]; Jiajie Chen[2]; Guangkui Hu[1]; Li Wang[1]; [1]Baoshan Iron & Steel Co., Ltd.; [2]Pan Asia Technical Automotive Center Co., Ltd.

2:40 PM
Development of a New Grade of Galvanized Direct Hot Press Hardenable Steel: *Chris Thomsen*[1]; Joseph McDermid[1]; Frank Goodwin[2]; [1]McMaster University; [2]International Zinc Association

3:00 PM
The Effect of Coating Process on Liquid Zn-assisted Embrittlement of TRIP Steel: *Doyub Kim*[1]; Jee-Hyun Kang[2]; Du-Youl Choi[3]; Sung-Joon Kim[1]; [1]POSTECH GIFT; [2]Yeungnam University; [3]POSCO

3:20 PM
Effect of Liquid Metal Embrittlement on Mechanical Behavior of Advanced High Strength Steel Spot Welds at Ambient and Low Temperatures: *Kayla Molnar*[1]; Matthew Zappulla[1]; John Speer[1]; Kip Findley[1]; [1]Colorado School of Mines

3:40 PM Break

4:00 PM
The Influence of Electrode Geometry on the Liquid Metal Embrittlement Cracking in Resistance Spot Welding of Advanced High Strength Steel: *Yeongdo Park*[1]; Siva Prasad Murugan[1]; [1]Dong-Eui University

4:20 PM
Application of Machine Learning to the Development of New Zn-based Coatings with Low Melting Temperature for Automotive Steels: *Rohit Bardapurkar*[1]; Sridhar Seetharaman[1]; John Speer[1]; Chris Borg[2]; Malcolm Davidson[2]; [1]Colorado School of Mines; [2]Citrine Informatics

4:40 PM
Influence of Treatment Regimes in the Conditions of SHS on the Development of Steel: *Borys Sereda*[1]; Dmytro Sereda[1]; [1]Dneprovsky State Technical University

Alpha Sigma Mu Lecture

Monday PM
September 30, 2019

Room: Portland Ballroom 254
Location: Oregon Convention Center

2:30 PM Invited
The Role of Additive Manufacturing in Industry 4.0: From Integrated Design and Fabrication to Structural Performance and Qualification: *Diana Lados*[1]; [1]Worcester Polytechnic Institute

Ceramic and Crystal Materials for Optics and Photonics — Session II

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Mark Dubinskiy, Army Research Laboratory; Randall Hay, U.S. Air Force Research Laboratory; Xiang-Hua Zhang, Université de Rennes 1; Michael Squillante, RMD, Inc; Long Zhang, Chinese Academy of Sciences; Takunori Taira, National Institutes of Natural Science

Monday PM
September 30, 2019

Room: A107
Location: Oregon Convention Center

Session Chairs: Ivar Reimanis, Colorado School of Mines; Hyunjun Kim, UES Inc.

2:00 PM
Development of Single Crystal Fiber Lasers: *Shyam Bayya*[1]; Woohong Kim[1]; Brandon Shaw[1]; Syed Qadri[1]; Daniel Gibson[1]; Jason Myers[1]; Daniel Rhonehouse[1]; Guillermo Villalobos[1]; Michael Hunt[1]; John Peele[2]; Ishwar Aggarwal[2]; Joseph Kolis[3]; Brad Stadleman[3]; Jas Sanghera[1]; [1]Naval Research Laboratory; [2]KeyW Corp; [3]Clemson University

2:40 PM Invited
Intriguing Optical Phenomena in Garnet Transparent Ceramic: *Farida Selim*[1]; Sahil Agarwal[1]; Le Zhang[2]; Yiquan Wu[3]; [1]Bowling Green State University; [2]Jiangsu Normal University; [3]New York State College of Ceramics, Alfred University

3:00 PM Invited
Investigation of Host Glasses for BaCl2:Eu2+ Layered Thin Films for Medical Imaging: *Jacqueline Johnson*[1]; Charles Bond[1]; Russell Leonard[1]; Anthony Lubinsky[2]; Yu Jin[3]; Amanda Petford-Long[4]; [1]University of Tennessee Space Institute; [2]SUNY Stony Brook; [3]Northwestern University; [4]Argonne National Laboratory

3:20 PM Break

3:40 PM Invited
Synthesis and Processing of Zinc Chalcogenides Optical Materials: *Shengquan Yu*[1]; Yiyu Yi[1]; Yiquan Wu[1]; [1]Alfred University

4:00 PM Invited
Transparent Ceramic for Extreme Environment: *Woohong (Rick) Kim*[1]; Shyam Bayya[1]; Guillermo Villalobos[1]; Michael Hunt[1]; Fritz Miklos[1]; Bryan Sadowski[1]; Jasbinder Sanghera[1]; [1]Naval Research Laboratory

4:20 PM Invited
Mixed-anion Ceramic Phosphors with Asymmetric Ligand Field for Rare-earths: *Setsuhisa Tanabe*[1]; [1]Kyoto University

Ceramics and Glasses Simulations and Machine Learning — Multi-scale Simulations of Ceramics and Glasses

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas; Efrain Hernandez, Army Research Laboratory

Monday PM
September 30, 2019

Room: A109
Location: Oregon Convention Center

Session Chair: Peter Kroll, University of Texas Arlington

2:00 PM Invited
Peridynamics Modeling of Impact-induced Crack Patterns in Glass: *N. M. Anoop Krishnan*[1]; Jonathan Berjikian[2]; Mathieu Bauchy[2]; Jared Rivera[2]; [1]Indian Institute of Technology Delhi; [2]University of California, Los Angeles

2:40 PM
Impact of Carbon Morphology on Mechanical Properties of SiCO Ceramics: *Shariq Haseen*[1]; Peter Kroll[1]; [1]University of Texas at Arlington

3:00 PM
Reactive MD Simulations of Polysiloxanes: Modeling the Polymer-to-Ceramic Route towards Silicon Oxycarbide Ceramics: *Ilia Ponomarev*[1]; Peter Kroll[1]; [1]University of Texas at Arlington

3:20 PM Break

3:40 PM
Atomistic Modeling of Fundamental Deformation Mechanisms in MAX Phases: *Gabriel Plummer*[1]; Garritt Tucker[1]; [1]Colorado School of Mines

4:00 PM
Development of Boron Oxide Potentials for Computer Simulations of Multi-component Oxide Glasses: *Lu Deng*[1]; Jincheng Du[1]; [1]University of North Texas

4:20 PM
Force-Enhanced Refinement of the Atomic Structure of Silicate Glasses: Qi Zhou[1]; *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

Characterization and Modeling of Metal Whisker Formation — Whisker Ubiquity and Mitigation

Program Organizers: Philip Eisenlohr, Michigan State University; Eric Chason, Brown University; Carol Handwerker, Purdue University

Monday PM
September 30, 2019

Room: E142
Location: Oregon Convention Center

Session Chair: Susmriti Das Mahapatra, Intel Corporation

2:00 PM Keynote
Spontaneous Metal Whisker Growth on MAX Phases and Beyond: *ZhengMing Sun*[1]; [1]Southeast University

2:40 PM
Characterization of Cadmium Plating Microstructure and Whiskers: *Zahra Ghanbari*[1]; Donald Susan[1]; Jamin Pillars[1]; Joseph Michael[1]; Sara Dickens[1]; Damion Cummings[1]; [1]Sandia National Laboratories

3:00 PM
Cadmium Whisker Growth on Cd-plated Steel Fastener Hardware: *Donald Susan*[1]; Zahra Ghanbari[1]; Jamin Pillars[1]; Bonnie McKenzie[1]; Joseph Michael[1]; Sara Dickens[1]; [1]Sandia National Laboratories

3:20 PM Invited
Whisker Mitigation in Indium Doped Tin Electroplating: *Bhaskar Majumdar*[1]; Indranath Dutta[2]; Sherin Bhassyvasantha[3]; Susmriti Das Mahapatra[4]; [1]New Mexico Institute of Mining and Technology; [2]Washington State University; [3]Molex, LLC; [4]Intel Corporation

Characterization of Materials and Properties through Metallography, Mechanical Testing and Analysis - From Fundamentals to the Cutting Edge — Microstructural Characterization and the Correlation of Microstructure to Mechanical Properties I

Program Organizer: Michael Keeble, Buehler

Monday PM
September 30, 2019

Room: F152
Location: Oregon Convention Center

Session Chairs: Frank Mücklich, Universität des Saarlandes; Michael Connelly, Casey Products (retired); Laura Moyer, Lehigh University

2:00 PM
How to Measure the Homogeneity of Microstructures – A New Tool for a Quantitative Determination of Object- and Region Homogeneity: *Dominik Britz*[1]; Ulrich Sonntag[2]; Johannes Webel[1]; Sven Ebner[1]; Michael Engstler[3]; Frank Muecklich[1]; [1]Material Engineering Center Saarland; [2]Society for the Advancement of Applied Computer Science; [3]Saarland University

2:20 PM
A Systematic Procedure for Phase Fraction Measurements from Backscattered Images Using the Rolling Ball Algorithm: *Mariana Rodrigues*[1]; Matthias Militzer[1]; [1]The University of British Columbia

2:40 PM
A Comparison between Anodizing and EBSD Techniques for Primary Particle Size Measurement: *Shahrooz Nafisi*[1]; Anthony Roccisano[2]; Reza Ghomashchi[2]; George Vander Voort[3]; [1]The University of Adelaide, University of Alberta, Consolidated Metco; [2]The University of Adelaide; [3]Consultant - Struers Inc., USA

3:00 PM
Revealing Prior Austenite Grain Size using the Oxidation, McQuaid – Ehn, and Saturated Picric Acid Methods: *Gabriel Lucas*[1]; Brian Battle[1]; [1]Scot Forge Company

3:20 PM Break

3:40 PM Invited
The Effect of Tensile Test Speed Control on Mechanical Properties of Metal: Daniel Dennies[1]; *Jaret Frafford*[2]; [1]DMS Inc; [2]IMR Test Labs - Portland

4:00 PM Invited
Results of an Interlaboratory Test Program to Assess the Precision of Inclusion Ratings Using ASTM E 45: *George Vander Voort*[1]; [1]Vander Voort Consulting L.L.C.

4:20 PM Invited
Panel Session on Interpretation and Implementation of ASTM Standards in Metallography: *Michael Keeble*[1]; [1]Buehler

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

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

Monday PM
September 30, 2019
Room: C123
Location: Oregon Convention Center

Session Chairs: Jian Shi, Rensselaer Polytechnic Institute; Haitao Zhang, University of North Carolina at Charlotte

2:00 PM Invited
Synthesis and Processing of Quantum Dots for Improved Photoluminescence Quantum Yields: *Gregory Herman*[1]; [1]Oregon State University

2:30 PM Invited
Assembly and Integration of Multisegment Nanowires for Electronics and Sensor Applications: *Zhiyong Gu*[1]; [1]University of Massachusetts Lowell

3:00 PM
A Novel Synthesis Method for Independent Control of Grain Size, Dispersion and Phase Composition of Thin Films: *Paul Rasmussen*[1]; Rohit Sarkar[1]; Jagannathan Rajagopalan[1]; [1]Arizona State University

3:20 PM Break

3:40 PM
Synthesis of Metallic Films with Precisely Tailored Multimodal Architectures: *Rohit Berlia*[1]; Jagannathan Rajagopalan[1]; [1]Arizona State University

4:00 PM
Phase-field Modeling of Self-organization in Physical Vapor-deposited Alloy Films with Coherent Elastic Misfit: *Rahul Raghavan*[1]; Kumar Ankit[1]; [1]School for Engineering of Matter, Transport and Energy, Arizona State University

4:20 PM Invited
In-situ Synthesis of CdS Nanowire Photosensor for Chemiluminescent Immunoassays: *Jae-Chul Pyun*[1]; [1]Yonsei University

4:50 PM
Boron Nitride Nanotubes with High Purity for Thermal Management: Mahmoud Amin[1]; David Kranbuehl[1]; *Hannes Schniepp*[1]; [1]The College of William & Mary

5:10 PM
Synthesis of PbSe Colloidal Quantum Dots Using a Batch Microwave Reactor: *Tyler McCrea*[1]; Stebby John[1]; Derek Dardzinski[1]; Erik Wislinsky[1]; Joseph Bergevin[1]; Haori Yang[1]; Gregory Herman[1]; [1]Oregon State University

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

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

Monday PM
September 30, 2019
Room: A108
Location: Oregon Convention Center

Session Chairs: Tonya Stone, Mississippi State University; Janelle Wharry, Purdue University; Gregg Janowski, University of Alabama at Birmingham; Jeffrey Fergus, Auburn University

2:00 PM
Addressing the Updated Engineering Design Definition in MSE Programs: *Kaitlin Tyler*[1]; [1]ANSYS Granta

2:20 PM
The Enrollment Floodgates Are Open – Best Practices in Materials Science and Engineering Undergraduate Education for Rising Enrollments: Workshop Findings: *Robert Kimel*[1]; Susan Sinnott[1]; [1]Penn State University

2:40 PM
Mentoring Best Practices for Interns: Panel Discussion: *Jonathan Zimmerman*[1]; Yi Liu[2]; Tonya Stone[3]; Su Gupta[4]; [1]Sandia National Laboratories (Moderator); [2]Fiat Chrysler Automobiles US; [3]Mississippi State University; [4]University of Alabama. The panel includes: Jonathan Zimmerman, Sandia National Laboratories (Moderator); Simona Hunyadi Murph, Savannah River National Laboratory; Clarissa Yablinsky, Los Alamos National Laboratory (staff and former intern); Chris San Marchi, Sandia National Laboratories; Rachel Seibert, Oak Ridge National Laboratory (former intern); Paul Prichard, Kennametal; Bill Clark, Intel (former intern at Hitachi Global Storage Technology); Garritt Tucker, Colorado School of Mines (former SNL intern).

Data Science for Material Property Interpretation — Dimensionality Reduction and Insight Generation from Materials Data

Program Organizers: Alex Belianinov, Oak Ridge National Laboratory; Ichiro Takeuchi, University of Maryland; Jeff Simmons, Wright Patterson Air Force Research Laboratory; Jason Hattrick-Simpers, National Institute of Standards and Technology

Monday PM
September 30, 2019
Room: E145
Location: Oregon Convention Center

Session Chair: Alex Belianinov, Oak Ridge National Laboratory

2:00 PM Invited
Deep Learning and MC-X ray, toward Automatic Sample Segmentation: Samantha Rudinsky[1]; Yu Yuan[1]; Raynald Gauvin[1]; Mike Marsh[2]; Benjamin Provencher[2]; *Nicolas Piché*[2]; [1]McGill University; [2]Object Research Systems

2:40 PM
Phase Field Regularization for Optimal Grain Reconstruction of Noisy Images: *Jeff Simmons*[1]; Amir Ziabari[2]; Lawrence Drummy[1]; Charles Bouman[3]; Jeffrey Rickman[4]; [1]US Air Force Research Laboratory; [2]Oak Ridge National Laboratory; [3]Purdue University; [4]Lehigh University

3:00 PM Invited
Model-based Reconstruction Algorithms for Time-of-Flight Neutron Tomography: *Singanallur Venkatakrishnan*[1]; Luc Dessieux[2]; Philip Bingham[1]; [1]Oak Ridge National Laboratory; [2]University of Tennessee Knoxville

3:40 PM Break

3:55 PM
Multi-modal Data Fusion and 3D Reconstruction of Serial Sectioning Data: *Megna Shah*[1]; Sean Donegan[1]; Michael Uchic[1]; [1]Air Force Research Laboratory

4:15 PM
Modeling and Simulation of Rare Events in Multidimensional Spaces: *Mary Comer*[1]; [1]Purdue University

4:35 PM
Digital Protocols for Statistical Quantification of Microstructure Features in Polycrystalline Nickel-based Superalloys: *Hyung Nun Kim*[1]; Surya Kalidindi[1]; Xuan Liu[2]; Max Kaplan[2]; [1]Georgia Institute of Technology; [2]Pratt & Whitney

4:55 PM
Human-in-the-loop Strategies for Dimensionality Reduction and Optimization in Materials Design: *Christopher Adair*[1]; S. Ryan Adair[2]; Seth Holladay[1]; Derek Hansen[1]; Oliver Johnson[1]; [1]Brigham Young University; [2]Southern Utah University

5:15 PM
Application of a Statistical Analysis Technique for Characterizing the Deformation Behavior of the Material under Dynamic Impact Loading: *Md Salah Uddin*[1]; Brahmananda Pramanik[1]; [1]Montana Technological University

Emergent Materials under Extremes and Decisive In-situ Characterizations — Decisive In-situ Characterizations

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

Monday PM
September 30, 2019
Room: D137
Location: Oregon Convention Center

Session Chairs: Wenge Yang, Center for High Pressure Science & Technology Advanced Research; Hua Zhou, Argonne National Laboratory

2:00 PM Invited
Materials Structure Evolution in Laser Additive Manufacturing Revealed by Synchrotron X-ray Imaging and Diffraction: *Tao Sun*[1]; Chih-Pin Chuang[1]; Lianyi Chen[2]; Anthony Rollett[3]; [1]Argonne National Laboratory; [2]Missouri University of Science and Technology; [3]Carnegie Mellon University

2:30 PM
In-situ and Time Resolved Characterization of Materials Using Liquid MetalJet X-ray Source: *Anasuya Adibhatla*[1]; B. Hansson[2]; M. Otendal[2]; P. Takman[2]; E. Espes[2]; T. Tuohimaa[2]; [1]Excillum Inc; [2]Excillum AB

2:50 PM
In-situ SEM Characterization of Phase Transformation in Metals and Alloys at High Temperatures: *James Ranney*[1]; Azin Akbari[1]; [1]Thermo Fisher Scentific

3:10 PM
Operando X-ray PDF Study of Na and K Ion Intercalation in MnO_2 Nanosheet Electrodes: Madeleine Flint[1]; Peter Metz[1]; Robert Koch[1]; Peng Gao[1]; Alec Ladonis[1]; *Scott Misture*[1]; [1]Alfred University

3:40 PM Break

4:00 PM
In-situ Aerodynamic Levitation Pair Distribution Function Studies: Alkali Silicate Crystallization and Sulfate-halide Liquids: *Emily Nienhuis*[1]; Natalie Smith-Gray[1]; John McCloy[1]; [1]Washington State University

4:20 PM
In-situ Study of Multi-scale Deformation in Two-photon Polymerized Microlattices: *Pranjal Nautiyal*[1]; Victoria Wiedorn[2]; Jenniffer Bustillos[1]; Nicole Bacca[1]; Xiaolong Lu[1]; Sharon Fleischer[3]; Gordana Vunjak-Novacovic[3]; Alice White[2]; Arvind Agarwal[1]; [1]Florida International University; [2]Boston University; [3]Columbia University

4:40 PM Panel Discussion

Failure Analysis & Characterization — Fatigue & Failure I

Program Organizers: Andrew Havics, PH2 LLC; James Lane, Rimkus Consulting Group Inc; Burak Akyuz, Applied Technical Services Inc; Pierre Dupont, UMONS, Faculté Polytechnique de MONS (FPMs)

Monday PM
September 30, 2019
Room: F150
Location: Oregon Convention Center

Session Chairs: Erhan Ulvan , Acuren Group Inc.; Robert O'Shea , Engineering Systems Inc; Daniel Baker , General Motors; Pierre Dupont , Schaeffler Belgium Sprl/bvba

2:00 PM Invited
Case Study Invoving Failure Sequence Determination of Machinery: *Ronald Parrington*[1]; Steven Counts[1]; [1]Engineering Systems Inc.

2:20 PM
Rolling Contact Fatigue Failure Analysis of Ball Bearing in Gear Box: *Piyas Palit*[1]; [1]Tata Steel Ltd

2:40 PM
Failure Analysis of a Separator Shaft: *Emily Bardugon*[1]; [1]Applied Technical Services Inc

3:00 PM
Failure Analysis of Racing Engine Components in Large Displacement V-8 Engines: Kyle Ventura[1]; Hugo Ortega[1]; Kathryn Harris[1]; David Rule[1]; Michael Pulver[1]; *Gerhard Fuchs*[1]; [1]University of Florida

3:20 PM Break

3:40 PM
Faulty Metallurgy and Maintenance Causing Bolt Failures in Oil and Gas Industry: *Waleed Khalifa*[1]; Iman El-Mahallawi[1]; [1]Cairo University

4:00 PM
The Root Cause of a Plant Fire: Bearing Defects and Pump Cavitation: *Michael Hoerner*[1]; Linda Robinson[1]; Pooja Sheth[1]; Farzam Mortazavi[1]; [1]KnightHawk Engineering

4:20 PM
Initiation and Propagation of Rolling Contact Fatigue Cracks Observed by Laminography Using Ultra-bright Synchrotron Radiation X-ray: *Yoshikazu Nakai*[1]; Daiki Shiozawa[1]; Shoichi Kikuchi[2]; Takashi Nishina[1]; Hiroshi Kobayashi[1]; Masanori Kurahashi[1]; Taizo Makino[3]; Yutaka Neishi[3]; [1]Kobe University; [2]Shizuoka University; [3]Nippon Steel & Sumitomo Metal Corporation

4:40 PM
Combatting Failures of Grate Bar in Sinter Plant and Pellet Plant: *Ankita Roy*[1]; [1]Tata STeel

Failure Analysis: Industry Specific Failures — Non-Metallic Failures

Program Organizers: Andrew Havics, PH2 LLC; James Lane, Rimkus Consulting Group Inc; Burak Akyuz, Applied Technical Services Inc; Pierre Dupont, UMONS, Faculté Polytechnique de MONS (FPMs)

Monday PM
September 30, 2019
Room: F151
Location: Oregon Convention Center

Session Chairs: Jonathan Morales, GE Aviation; Dennis McGarry, SEA Limited; Gregory Chojecki, SEA Limited; Ronald Parrington, ESI

2:00 PM
Failure of Underground ABS Dry Compressed Air Piping: *Joseph Lemberg*[1]; Jared Schwartz[1]; Steven MacLean[1]; [1]Exponent, Inc.

2:20 PM
Why Threaded Plastic Couplings Fail in Service: Dennis McGarry[1]; *Greg Chojecki*[1]; David Riegner[1]; [1]SEA Ltd

2:40 PM
Polymer Failures: Case Histories: *Fahmida Hossain*[1]; Veda-Anne Ulcickas[1]; [1]Massachusetts Materials Research, Inc.

3:00 PM
The Identification of Plastic Additives in a Failure Analysis Investigation: *Amy Wells*[1]; Bill Carden[1]; Richard McSwain[1]; [1]McSwain Engineering, Inc

3:20 PM Break

3:40 PM
Carbonyl Index Depth Profiling via Micro FTIR and FPA Detection: *Jason Babcock*[1]; Mark Weiss[1]; Donald Duvall[1]; Dale Edwards[1]; Andy Shah[1]; [1]Engineering Systems Inc.

4:00 PM
Coating Cases: Failure & Prevention: *Andrew Havics*[1]; [1]PH2 LLC

4:20 PM
Failure Analysis of a Ceramic Seal in a Fluid Rotary Joint for an Aerospace Application: *Kevin Chasse*[1]; John Dahill[1]; Aaron West[1]; Daniel Zivi[1]; Michael Bednarczyk[1]; [1]Northrop Grumman Corporation

Glasses, Optical Materials, and Devices: Current Issues in Science & Technology — Modeling and Simulations of Glass Materials

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

Monday PM
September 30, 2019
Room: A106
Location: Oregon Convention Center

Session Chairs: Jincheng Du, University of North Texas; Carlo Massobrio, l'Institut de Physique et Chimie des Matériaux de Strasbourg (IPCMS)

2:00 PM Invited
Melting Mechanisms in Alkali Metasilicates: *Alastair Cormack*[1]; [1]Alfred University

2:30 PM Invited
Glassy Materials via First-principles Molecular Dynamics: Recent Results: *Carlo Massobrio*[1]; [1]IPCMS-CNRS

3:00 PM
Reactive Potential based Simulations of Sodium Silicate Glasses: *Lu Deng*[1]; Shingo Urata[2]; Yasuyuki Takimoto[2]; Tatsuya Miyajima[2]; Seung Ho Hahn[3]; Adri C. T. van Duin[3]; Jincheng Du[1]; [1]University of North Texas; [2]AGC Inc.; [3]The Pennsylvania State University

3:20 PM Break

3:40 PM Invited
Machine Learning for Glass Science and Engineering: *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

4:10 PM Invited
Quantitative Structural Property Relationship Analysis of Multicomponent Silicate Glasses: *Jincheng Du*[1]; [1]University of North Texas

4:40 PM
Role of Exchange-correlation Functionals and Dispersion Forces in Determining the Structural Properties of Glasses: *Carlo Massobrio*[1]; [1]IPCMS-CNRS

5:00 PM
Cooling Rate Effects on the Structure of 45S5 Bioglass: Yashasvi Maurya[1]; Pratik Bhaskar[1]; Rajesh Kumar[1]; *N. M. Anoop Krishnan*[1]; [1]Indian Institute of Technology Delhi

Grain Boundaries, Interfaces, and Surfaces in Functional Materials: Fundamental Structure-Property-Performance Relationships — Ferroelectricity/ Nanocrystalline and Nanoparticulate Materials

Program Organizers: Ming Tang, Rice University; Shen Dillon, University of Illinois, Urbana-Champaign; John Blendell, Purdue University; Wayne Kaplan, Technion - Israel Institute of Technology

Monday PM
September 30, 2019

Room: E143
Location: Oregon Convention Center

Session Chairs: John Blendell, Purdue University; Catherine Bishop, University of Canterbury

2:00 PM Invited
Ferroelectricity in Methylammonium Lead Iodide Perovskite Solar Cells: Holger Röhm[1]; Tobias Leonhard[1]; Alexander Schulz[1]; Susanne Wagner[1]; Michael Hoffmann[1]; *Alexander Colsmann*[1]; [1]Karlsruhe Institute of Technology (KIT)

2:30 PM Invited
3-D Resolved Ferroelectric Domains via Tomographic AFM: *Jingfeng Song*[1]; James Steffes[1]; Michael Martin[1]; Yen Lin Huang[2]; Spencer Matonis[1]; Ramamoorthy Ramesh[2]; Bryan Huey[1]; [1]University of Connecticut; [2]Materials Science and Engineering, UC Berkeley

3:00 PM
Stress, Strain, and Rotation Mapping of Ferroelectric Domains in BaTiO3 Using Electron Backscatter Diffraction: Jane Howell[1]; Mark Vaudin[1]; *Lawrence Friedman*[1]; Robert Cook[1]; [1]National Institute of Standards and Technology

3:20 PM Break

3:40 PM Invited
TTT Relations for Ferroelectrics Near the Polymorphic Phase Boundary: Insights from a New Model for BZT-BCT: *Catherine Bishop*[1]; Oscar Torres-Matheus[1]; R. Garcia[2]; [1]University of Canterbury; [2]Purdue University

4:10 PM Invited
Chemical Partitioning Behavior in Grain Boundaries: Pt(Au) Nanocrystalline Grains: Xuyang Zhou[1]; Brad Boyce[2]; Blythe Clark[3]; *Gregory Thompson*[1]; [1]The University of Alabama; [2]Sandia National Laboratory ; [3]Sandia National Laboratory

4:40 PM
Investigating The Role of Grain Boundary Segregation v/s Precipitation on the Thermo-mechanical Stability of Nanocrystalline Alloys: *Ankit Gupta*[1]; Xuyang Zhou[2]; Gregory Thompson[2]; Garritt Tucker[1]; [1]Colorado School of Mines; [2]University of Alabama

5:00 PM
Elucidating Structure-property Relationships for the Rational Design of Strongly Interacting Nanoparticles on Lanthanide Perovskites: *Kandis Abdul-Aziz*[1]; Soham Shah[1]; Tu Nguyen[1]; [1]University of California, Riverside

5:20 PM
Developing New Grain Boundary Structure-property Relations through Higher-Order Atomic Descriptors: *Jacob Tavenner*[1]; Branden Kappes[1]; Garritt Tucker[1]; [1]Colorado School of Mines

Hydrogen Effects on Materials Performance — Hydrogen Effects on High Entropy Alloys and Superalloys

Program Organizers: Samantha Lawrence, Los Alamos National Laboratory; Kip Findley, Colorado School of Mines; Megan Cordill, Erich Schmid Institute for Materials Science

Monday PM
September 30, 2019

Room: E146
Location: Oregon Convention Center

Session Chairs: Samantha Lawrence, Los Alamos National Laboratory; Joseph Ronevich, Sandia National Laboratories

2:00 PM Invited
Hydrogen Embrittlement in fcc High Entropy Alloys: *Xiao Zhou*[1]; Ali Tehranchi[2]; William Curtin[1]; [1]EPFL; [2]Max-Planck-Institut f˙ur Eisenforschung GmbH

2:30 PM
Mechanical Behavior of High-entropy Alloys Hydrogenated under Different Conditions: Yakai Zhao[1]; Jeong-Min Park[2]; Dong-Hyun Lee[3]; Jin-Yoo Suh[4]; Upadrasta Ramamurty[1]; *Jae-il Jang*[2]; [1]Nanyang Technological University; [2]Hanyang University; [3]Max-Planck-Institut für Eisenforschung ; [4]Korea Institute of Science and Technology

2:50 PM
Impact of Hydrogen on the Mechanical Properties of a Severely Deformed Equimolar CrMnFeCoNi High-entropy Alloy: *Anna Ebner*[1]; Helmut Clemens[1]; Reinhard Pippan[2]; Verena Maier-Kiener[1]; [1]Montanuniversität Leoben; [2]Austrian Academy of Sciences

3:10 PM Question and Answer Period

3:20 PM Break

3:40 PM
A Simulation Model for Cold Cracking In High Strength Steel Welds Based on the Local Stress Distribution and Hydrogen Accumulation: *Yuya Sato*[1]; Nobuyuki Ishikawa[1]; [1]JFE Steel Corporation

4:00 PM Invited
A Review of Microstructure Effects on Hydrogen Induced Crack Growth Susceptibility of a High Strength Iron Based Superalloy: *Neville Moody*[1]; Warren Garrison[2]; Steven Robinson[1]; Mark Perra[1]; William Gerberich[3]; [1]Sandia National Laboratories (Retired); [2]Carnegie Mellon University; [3]University of Minnesota

4:30 PM
Effect of Stress State on Hydrogen Embrittlement in Alloy718: William Hickey[1]; *John Macha*[1]; Brian Somerday[1]; [1]Southwest Research Institute

4:50 PM
Effects of Alloy 718 Microstructure on Hydrogen Embrittlement: *Brian Kagay*[1]; Kip Findley[1]; Steve Coryell[2]; [1]Colorado School of Mines; [2]Special Metals Corporation

5:10 PM
Resistance of Ni and Its Alloys to Hydrogen Embrittlement: Effects of Alloying and Heat Treatment: *Vsevolod Razumovskiy*[1]; Shuang He[1]; Daniel Sheiber[1]; Reinhard Pippan[2]; Werner Ecker[1]; [1]Materials Center Leoben Forschung Gmbh; [2]Erich Schmid Institut of Materials Science

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

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

Monday PM
September 30, 2019

Room: G132
Location: Oregon Convention Center

Session Chairs: Samrat Choudhury, University of Idaho; Kelvin Xie, Texas A&M University College of Engineering

2:00 PM Invited
Integrated Computational Materials Engineering of hydrogen embrittlement in High-Hardness-Steel: *Sara Adibi*[1]; Doyl Dickel[1]; Luke Peterson[1]; Nayeon Lee[1]; Mun Sungkwang[1]; Bradley Huddleston[1]; Yubraj Paudel[1]; Anand Balu[1]; Raj Prabhu[1]; Youssef Hammi[1]; Douglas Bammann[1]; [1]Center for Advanced Vehicular Systems

2:30 PM Invited
Machine Learning of Phase-field Simulated Microstructures: *Samrat Choudhury*[1]; Isaac Curtis[1]; Abhishek Thakur[1]; Vishnu Boddeti[2]; [1]University of Idaho; [2]Michigan State University

3:00 PM
Investigating the Mechanical Response of 122 Compounds Utilizing Experiments and Modeling: *Christopher Weinberger*[1]; Ian Bakst[1]; John Sypek[2]; Keith Dusoe[2]; Hang Yu[3]; Paul Canfield[4]; Keara Frawley[2]; Sriram Vijayan[2]; Mark Aindow[2]; Seok-Woo Lee[3]; [1]Colorado State University; [2]University of Connecticut; [3]Drexel University; [4]Iowa State University

3:20 PM Break

3:40 PM Invited
3D TEM Characterization of Nano-precipitates in a Ni-Ti-Hf Shape Memory Alloy: *Kelvin Xie*[1]; Dexin Zhao[1]; [1]Texas A&M University

4:10 PM Invited
Decoupling Thermal, Mechanical, and Irradiation Stability Mechanisms in Nanocrystalline Pt Alloys: *Khalid Hattar*[1]; Christopher Barr[1]; Nathan Heckman[1]; Brad Boyce[1]; Stephen Foiles[1]; Fadi Abdeljawad[2]; [1]Sandia National Laboratories; [2]Clemson University

4:40 PM
Large Scale Molecular Dynamics Simulations of Rapid Directional Solidification of Aluminum Alloys: *Mohsen Asle Zaeem*[1]; Avik Mahata[2]; [1]Colorado School of Mines; [2]Missouri University of Science and Technology

5:00 PM Invited
Direct Imaging of Chemical Short-range Order and Its Impact on Deformation in Metal Alloys: *Ruopeng Zhang*[1]; Shiteng Zhao[1]; Colin Ophus[2]; Yu Deng[3]; Shraddha Vachhani[4]; Burak Ozdol[2]; Rachel Traylor[1]; Jun Ding[5]; Karen Bustillo[2]; John Morris[1]; Daryl Chrzan[1]; Mark Asta[1]; Robert Ritchie[1]; Andrew Minor[1]; [1]UC Berkeley; [2]National Center for Electron Microscopy, Molecular Foundry, Lawrence Berkeley National Laboratory; [3]Center of Modern Analysis, Nanjing University; [4]Bruker Nano Surfaces; [5]Materials Sciences Division, Lawrence Berkeley National Laboratory

Joining of Advanced and Specialty Materials XXI — Friction and Friction Stir Welding II / Welding Proceses

Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee; Hiroaki Mori, Osaka University; Yuri Hovanski, Brigham Young University; Darren Barborak, WeldQC Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell; Zhenzhen Yu, Colorado School of Mines

Monday PM
September 30, 2019

Room: Portland Ballroom 252
Location: Oregon Convention Center

Session Chairs: Judy Schneider, University of Alabama at Huntsville; Carolin Fink, Ohio State University

2:00 PM
Thermal Modeling of Continuous Drive Friction Welding for Al6061: *Mohammed Tashkandi*[1]; [1]Northern Border University

2:20 PM
Reducing Cycle Time of Refill Friction Stir Spot Welding: *Yuri Hovanski*[1]; Brigham Larsen[1]; Arnold Wright[1]; Michael Miles[1]; [1]Brigham Young University

2:40 PM
Material Properties of Friction Stir Spot Welded Joint of Steel and Heat-treatable Aluminum Alloys: *Kun Gao*[1]; Mounarik Mondal[1]; Hrishikesh Das[1]; Mi Na Jeong[1]; Sung-Tae Hong[1]; [1]University of Ulsan

3:00 PM
Joining of Magnesium to Carbon Fiber Reinforced Polymers Using Friction Stir Interlocking Technique: *Tianhao Wang*[1]; Piyush Upadhyay[1]; Scott Whalen[1]; Keerti Kappagantula[1]; [1]Pacific Northwest National Laboratory

3:20 PM
Joining of Carbon Fiber Reinforced Composites to AZ31B using Friction Self-piercing Riveting: *Yong Chae Lim*[1]; Charles Warren[1]; Jian Chen[1]; Jiheon Jun[1]; Zhili Feng[1]; [1]Oak Ridge National Laboratory

3:40 PM Break

4:00 PM
Machine Learning Application for Active Exploration of Weld Sequence Scenarios: *Mahyar Asadi*[1]; Mohammad Mohseni[1]; Majid Tanbakuei Kashani[1]; Michael Fernandez[1]; Mathew Smith[1]; [1]SKC Engineering (An Applus Company)

4:20 PM
Theoretical Analysis of Keyhole Dynamics Based on Calculation of Coupled Multiphase Transfer during Laser Beam Welding for Aluminum: *Hiroaki Mori*[1]; Qiaofeng Zhou[1]; Fumikazu Miyasaka[1]; [1]Osaka University

4:40 PM
The Effects of Pre-pulse & Profile Force on Nugget Growth and Weldability for Resistance Spot Welding of A6014 Alloy: *Changwook Ji*[1]; Joo-Yong Cheon[1]; Jae-Hoon Kim[1]; Jun Hyun Uk[1]; [1]Korea Institute of Industrial Technology

5:00 PM
Investigations on Welding Characteristics of Additively Manufactured Ti6Al4V and SS304: *Timothy Pasang*[1]; Sreenidhi Roshinkumar[1]; Zainab Manasawala[1]; Jia-Chang Wang[2]; Cho-Pei Jiang[2]; Alex Kirchner[3]; [1]Auckland Technical University; [2]National Taipei University of Technology; [3]Fraunhofer - Institute for Advanced Materials

Materials for Nuclear Applications — Nuclear Fuels and Cladding

Program Organizers: Philip Edmondson, Oak Ridge National Laboratory; Yutai Katoh, Oak Ridge National Laboratory; Jake Amoroso, Savannah River National Laboratory; Levi Gardner, University of Utah; Amy Gandy, University of Sheffield; Karl Whittle, University of Liverpool; Monica Ferraris, Politecnico di Torino

Monday PM
September 30, 2019

Room: E148
Location: Oregon Convention Center

Session Chair: Karl Whittle, University of Liverpool

2:00 PM
Compatibility of U3Si2 fuel with FeCrAl and SiC/SiC Based Cladding: Denise Lopes[1]; *Vancho Kocevski*[1]; Theodore Besmann[1]; [1]University of South Carolina

2:20 PM Invited
Uranium Nitride and High Temperature Irradiation Resistant Thermocouples towards Accident Tolerant Nuclear Fuel: *Ember Sikorski*[1]; Lan Li[1]; [1]Boise State University

3:00 PM
Characterization of the Impact of Fission Product Inclusion on Phase Development in U_3Si_2 Fuel: *Kaitlin Johnson*[1]; Denise Lopes[2]; Tashiema Wilson[1]; Theodore Besmann[1]; [1]University of South Carolina; [2]Westinghouse Electric Co., LLC

3:20 PM
Steam Oxidation and Microstructural Characterization of U_3Si_2 alloyed with Al, Cr, Nb, Y, and Zr: *Elizabeth Sooby Wood*[1]; Cole Moczygemba[1]; Geronimo Robles[1]; Christopher Grote[2]; Lu Cai[3]; Peng Xu[3]; Edward Lahoda[3]; [1]The University of Texas at San Antonio; [2]Los Alamos National Laboratory; [3]Westinghouse Electric Company

3:40 PM Break

4:00 PM
Design of Alloy Chemistry to Mitigate Fuel-Cladding Chemical Interactions in Uranium-based Metallic Fuels: Rabi Khanal[1]; Nathan Jerred[1]; Indrajit Charit[1]; Michael Benson[2]; Robert Mariani[2]; *Samrat Choudhury*[1]; [1]University of Idaho; [2]Idaho National Laboratory

4:20 PM
Anisotropic Thermal Transport in Uranium Dioxide Induced by Dislocation: *Suvash Ghimire*[1]; Bowen Deng[1]; [1]Montana Technological Unviersity

4:40 PM
Spectral Thermal Conductivity Predictions in UO_2 with Xe Inclusions: *Jackson Harter*[1]; Aria Hosseini[2]; Todd Palmer[1]; Alex Greaney[2]; [1]Oregon State University; [2]University of California - Riverside

5:00 PM
Materials for Capture of Uranium for Nuclear Fuel from Fertilizer: *Allen Apblett*[1]; Cory Perkins[2]; [1]Oklahoma State University; [2]Oregon State University

5:20 PM
PVD Coating of Surrogate Fuels for Deep Space Nuclear Thermal Propulsion: Maanas Togaru[1]; Thomas Koenig[1]; *Gregory Thompson*[1]; [1]The University of Alabama

Materials Issues in Nuclear Waste Management — Materials Issues in Nuclear Waste Technology II: Properties of Nuclear Waste Forms: Modeling, Experiments, and Applications

Program Organizers: Jake Amoroso, Savannah River National Laboratory; Kyle Brinkman, Clemson University; Kevin Fox, Savannah River National Laboratory; Cory Trivelpiece, Savannah River National Laboratory; Jarrod Crum, Pacific Northwest National Laboratory

Monday PM
September 30, 2019

Room: E147
Location: Oregon Convention Center

Session Chairs: Cory Trivelpiece, Savannah River National Laboratory; Josef Matyas, Pacific Northwest National Laboratory

2:00 PM Invited
Aerogels with Enhanced Gas Permeability and Mechanical Strength for Use as Membranes in Radioiodine Capture: *Krista Carlson*[1]; [1]University of Utah

2:40 PM
The Influence of Reducing Conditions on the Stabilization of Iodine Containing Solid Secondary Wastes: *Matthew Asmussen*[1]; Sarah Saslow[1]; James Neeway[1]; Joseph Westsik[1]; Gary Smith[1]; [1]Pacific Northwestern National Laboratory

3:00 PM
Dechlorination Methods and Ceramic Waste Forms for the Immobilization of Electrorefiner Salt: *Levi Gardner*[1]; [1]University of Utah

3:20 PM Break

3:40 PM
Effect of Solution Chemistry on the Release Mechanism of Iodine from Iodoapatite Waste Form in Aqueous Environments: *Zelong Zhang*[1]; Jianwei Wang[1]; [1]Louisiana State University

4:00 PM
Observations of Crystal Settling Behavior in a Full-Scale HLW Melter Mock-Up: *Kevin Fox*[1]; Mark Fowley[1]; Albert Kruger[2]; [1]Savannah River National Laboratory; [2]U.S. Department of Energy Office of River Protection

4:20 PM
Impact of Redox on Crystallization Behavior of Spinel Crystals in HLW Borosilicate Glasses: *Josef Matyas*[1]; [1]Pacific Northwest National Laboratory

4:40 PM
Optimization of Frit Composition for Coupled Operation of the Defense Waste Processing Facility and Salt Waste Processing Facility at the Savannah River Site: *Fabienne Johnson*[1]; Thomas Edwards[1]; [1]Savannah River National Laboratory

5:00 PM Invited
Melt-Cast Ceramic Waste Forms: Laboratory Development and Scaled Demonstrations: *Jake Amoroso*[1]; [1]Savannah River National Laboratory

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

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

Monday PM
September 30, 2019
Room: F149
Location: Oregon Convention Center

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

2:00 PM Invited
Unraveling the Mechanisms of Pore Space Cementation in Quartz Sandstone: A 3D Phase-field Approach: *Kumar Ankit*[1]; [1]Arizona State University

2:30 PM
Energetics of the Interfacial Interactions between Oil Molecules, Calcite and Kerogen – Implication for Hydrocarbon Transport and Storage in Shale: *Zelong Zhang*[1]; Jianwei Wang[1]; [1]Louisiana State University

2:50 PM
Surface Structure and Energetics at the Salt-Brine Interface: *Jessica Rimsza*[1]; Kristopher Kuhlman[1]; [1]Sandia National Laboratories

3:10 PM Concluding Comments

Mechanochemical Synthesis and Reactions in Materials Science IV — Session II

Program Organizers: Antonio Fuentes, Cinvestav Unidad Saltillo; Laszlo Takacs, University of Maryland Baltimore County; Challapalli Suryanarayana, University of Central Florida; Jacques Huot, Universite du Quebec a Trois-Rivieres

Monday PM
September 30, 2019
Room: E141
Location: Oregon Convention Center

Session Chair: Jürgen Eckert, Montanuniversität Leoben

2:00 PM Invited
Mechanically Alloyed Nanostructured Steels: *Challapalli Suryanarayana*[1]; Ahmed Al-Joubori[1]; [1]University of Central Florida

2:40 PM Invited
Nanocrystalline Maraging Steel Powder Fabricated by Mechanical Milling and their Thermal Stability: Ganesh Varma Thotakura[1]; *Tanjore Jayaraman*[1]; [1]University of Michigan-Dearborn

3:20 PM Break

3:40 PM
First Hydrogenation Characteristic of TiFe + 4wt% Zr + 2wt% Mn Alloy after Air Exposure and Reactivation by Mechanical Treatment: Joydev Manna[1]; *Huot Jacques*[1]; [1]University Du Quebec A Trois Rivieres

4:10 PM
Easy Access to Copper-antimony Mixed Sulfides (CuxSbySz): Mechanochemical Synthesis, and Structural and Surface Analysis: *Antonio Fuentes*[1]; Francisco López-Cota[1]; Isidro González-Panzo[2]; José Díaz-Guillén[3]; Joelis Rodríguez-Hernández[4]; Patricia Quintana[2]; [1]Cinvestav Unidad Saltillo; [2]Cinvestav Unidad Mérida; [3]Instituto Tecnológico de Saltillo; [4]Centro de Investigación en Química Aplicada

4:40 PM Invited
Metallic Glasses Reinforced Al Alloy Matrix Composites: *Zhi Wang*[1]; [1]South China University of Technology

Metal and Polymer Matrix Composites IV — Polymer Matrix Composites II

Program Organizers: Nikhil Gupta, New York University; Tomoko Sano, U.S. Army Research Laboratory

Monday PM
September 30, 2019
Room: D136
Location: Oregon Convention Center

Session Chairs: Daniel Merkel, Pacific Northwest National Laboratory; Jonathan Ligda, US Army Research Laboratory

2:00 PM
Shape Memory Behavior and Mechanical Properties of Graphene Foam-Based Epoxy Composites: *Adeyinka Idowu*[1]; Pranjal Nautiyal[1]; Jenniffer Bustillos[1]; Benjamin Boesl[1]; Arvind Agarwal[1]; [1]Florida International University

2:20 PM
Probing Local Mechanical Properties in Polymer-ceramic Hybrid Acetabular Sockets using Sphreical Indentation Stress-strain Protocols: *Hyung Nun Kim*[1]; Surya Kalidindi[1]; Sourav Mandal[2]; Bikramjit Basu[2]; [1]Georgia Institute of Technology; [2]Indian Institute of Science

2:40 PM
Artificial Neural Network Based Machine Learning Methods in Characterization of Composite Materials: Xianbo Xu[1]; *Nikhil Gupta*[1]; [1]New York University

3:00 PM
Material Challenges for Cryogenic Hydrogen Storage Technologies: *Daniel Merkel*[1]; Kevin Simmons[1]; [1]Pacific Northwest National Laboratory

3:20 PM Break

3:40 PM
Quantitative Investigation of Fracture in Brittle/Quasi-Brittle Solids: *Carl Cady*[1]; Cheng Liu[1]; [1]Los Alamos National Laboratory

4:00 PM
Lateral Constraint Effects on Flat Punch Nanoindentation: *Nathan Bailey*[1]; [1]Exponent, Inc.

Metamorphic Manufacturing – Incremental Deformation Processing for Agile, High-quality Metallic Component Production — Metamorphic Manufacturing II: Microstructures by Design

Program Organizers: Kester Clarke, Colorado School of Mines; Glenn Daehn, Ohio State University

Monday PM
September 30, 2019
Room: D138
Location: Oregon Convention Center

Session Chairs: Glenn Daehn, The Ohio State University; Kester Clarke, Colorado School of Mines

2:00 PM Invited
Lagrangian Finite Element Simulation of Metaphorphic Manufacturing: *Michael Miles*[1]; [1]Brigham Young University

2:40 PM
Metamorphic Manufacturing: Processing Pathways to Manufacture Custom Geometry Components with Tailored Microstructures: *Kester Clarke*[1]; Amy Clarke[1]; [1]Colorado School of Mines

3:00 PM
Multimodal Atomic Scale Characterization of Structural and Compositional Changes During Shear Deformation of Materials: *Bharat Gwalani*[1]; Tiffany Kaspar[1]; Yang He[1]; Tamas Varga[1]; Chongmin Wang[1]; Peter Sushko[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory

3:20 PM Break

3:40 PM Invited
Setting Component Properties in Incremental Forming: *Fabian Maass*[1]; Mateus Dobecki[2]; Marlon Hahn[1]; A. Tekkaya[1]; Walter Reimers[2]; [1]Institute of Forming Technology and Lightweight Components (IUL), TU Dortmund; [2]Institute for Materials Science and Technology - Metallic Materials, TU Berlin

4:20 PM Invited
Complexity & Functionality of Automotive Structural Components with Tailored Properties: *Paul Belanger*[1]; Lindsay Golem[1]; Manuel Lopez Lage[2]; Laura Galaceran[2]; [1]Gestamp Research & Development North America; [2]Gestamp Research & Development Barcelona

5:00 PM
Solid Phase Processing of AA6XXX and AA7XXX Alloys via Shape Approach: *Keerti Kappagantula*[1]; Jens Darsell[1]; Rajib Kalsar[1]; Scott Whalen[1]; Glenn Grant[1]; Darrell Herling[1]; Vineet Joshi[1]; [1]Pacific Northwest National Laboratory

Modeling Variability of Mechanical Behavior through ICME Techniques with Emphasis on Verification, Validation & Uncertainty Quantification — Data Science

Program Organizers: Jacob Hochhalter, University of Utah; Michael Sangid, Purdue University; Corbett Battaile, Sandia National Laboratories; Barron Bichon, Southwest Research Institutue

Monday PM
September 30, 2019

Room: D135
Location: Oregon Convention Center

Session Chairs: Michael Sangid, Purdue University; Corbett Battaille, Sandia

2:00 PM Invited
Data Analytics for ICME: *Anthony Rollett*[1]; Christopher Kantzos[1]; Joseph Pauza[1]; Sudipto Mandal[2]; Ziheng Wu[1]; Robert Suter[1]; Seunghee Oh[1]; Wesley Tayon[3]; Tao Sun[4]; Niranjan Parab[4]; Cang Zhao[4]; Po-Ju Chiang[1]; [1]Carnegie Mellon University; [2]Intel; [3]NASA; [4]Argonne National Laboratory

2:40 PM Invited
Information Fusion-based Microstructure Sensitive Materials Design: *Raymundo Arroyave*[1]; Abhilash Molkeri[1]; Richard Couperthwaite[1]; Seyefe Fatheme Ghoreishi[1]; Ankit Srivastava[1]; Douglas Allaire[1]; [1]Texas A&M University

3:00 PM
Modern Data Analytics Approach to Predict the Yield Strength of 9Cr Steels: *Jian Peng*[1]; Dongwon Shin[1]; Yukinori Yamamoto[1]; Jeffrey Hawk[2]; Edgar Lara-Curzio[1]; [1]Oak Ridge National Laboratory; [2]National Energy Technology Laboratory

3:20 PM
Neural Network Potential for Al and Zn: *Mashroor Nitol*[1]; Doyl Dickel[2]; Christopher Barrett[1]; [1]Mississippi State University; [2]Center of Advanced Vehicular System

3:40 PM Break

4:00 PM Invited
An Experimental Perspective on Computational Validation for Dynamic Mechanical Behavior: *Benjamin Morrow*[1]; Francis Addessio[1]; Curt Bronkhorst[2]; Ellen Cerreta[1]; Biao Feng[1]; David Jones[1]; Ricardo Lebensohn[1]; [1]Los Alamos National Laboratory; [2]University of Wisconsin-Madison

4:40 PM Invited
Predicting the Effects of Microstructure on Matrix Cracking Evolution in Fiber Reinforced CMCs via Machine Learning: *Dipen Patel*[1]; Triplicane Parthasarathy[1]; Craig Przybyla[2]; [1]Air Force Research Laboratory/UES, Inc.; [2]Air Force Research Laboratory

5:00 PM
Integrated Computational Materials Engineering (ICME) Techniques to Enable a Material-Informed Digital Twin Prototype for Marine Structures: *Charles Fisher*[1]; Alysson Mondoro[1]; Young Hwang[1]; Ken Nahshon[1]; [1]Naval Surface Warfare Center - Carderock

Multi-scale Modeling of Microstructure Deformation in Material Processing — Multi-scale Modeling of Microstructure Deformation in Material Processing II

Program Organizers: Lukasz Madej, AGH University of Science and Technology; Jaimie Tiley, Air Force Office of Scientific Research (AFOSR/RTA); Krzysztof Muszka, AGH University of Science and Technology; Danuta Szeliga, AGH University of Science and Technology

Monday PM
September 30, 2019

Room: D134
Location: Oregon Convention Center

Session Chair: Krzysztof Muszka, AGH University of Science and Technology

2:00 PM
Mechanism of Wetting of a Nano-suspension Droplet: Insights from MD Simulations: *Baiou Shi*[1]; Viet Le[1]; [1]Penn State Erie

2:20 PM
Probing Twin Nucleation in Ti with Nudged Elastic Band Method: *Deepesh Giri*[1]; Christopher Barrett[1]; Haitham El Kadiri[1]; [1]Mississippi State University

2:40 PM
Reactive Molecular Dynamics Modeling of the Compression of Two-Phase Composites of Cement Paste: *Ingrid Padilla Espinosa*[1]; Ram Mohan[1]; [1]North Carolina A&T State University

3:00 PM
Texture Evolution in Materials with Layered Crystal Structures: *Vamsi Krishna Vempati*[1]; Raghavan Srinivasan[1]; [1]Wright State University

3:20 PM Break

3:40 PM
Handling of the Micro-Macro Models Communication in the Fully-coupled Multiscale Approach: *Adam Legwand*[1]; Lukasz Madej[1]; [1]AGH University of Science and Technology

4:00 PM
Numerical Simulation of Molten Steel Flow and Inclusion Capture during Slab Continuously Casting: *Yanbin Yin*[1]; Jiongming Zhang[1]; [1]University of Science and Technology, Beijing

4:20 PM
Recrystallization and Grain Growth Simulations for Multiple-Pass Rolling and Annealing of U-10Mo: *William Frazier*[1]; Chao Wang[1]; Shenyang Hu[1]; Zhijie Xu[1]; Vineet Joshi[1]; [1]PNNL

4:40 PM
Study of Interface Microstructure of Bi-metal Plates Prepared Cold Rolling: *Choong-un Kim*[1]; Manasi Puranik[1]; [1]University of Texas at Arlington

Nanostructured Materials under Extreme Environments — Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanostructured Materials I

Program Organizers: Jin Li, Purdue University; Assel Aitkaliyeva, University of Florida; Youxing Chen, University of North Carolina at Charlotte; Yue Liu, Shanghai Jiao Tong University; Shuai Shao, Louisiana State University

Monday PM
September 30, 2019

Room: D133
Location: Oregon Convention Center

Session Chairs: Youxing Chen, University of North Carolina at Charlotte; Jin Li, Purdue University

2:00 PM Invited
Modeling and Experiments of Small Scale Fracture Toughness to 1073 K: *William Gerberich*[1]; Kevin Schmalbach[1]; Nathan Mara[1]; [1]University of Minnesota

2:30 PM Invited
Roles of Heady Deformation on Microstructure and Properties on Nitrided Ferritic Steels: *Tadashi Furuhara*[1]; Fanhui Meng[2]; Goro Miyamoto[1]; Yoshikazu Todaka[3]; [1]Tohoku University; [2]Hitachi Construction Machinery Co., Ltd; [3]Toyohashi University of Technology

3:00 PM
Effect of Cyclic Deformation on the Evolution of Microstructures and Residual Stresses in Nanostructured Ti-6Al-4V: *Fuqian Yang*[1]; [1]University of Kentucky

3:20 PM Break

3:40 PM Invited
Strengthening and Work Hardening in Gradient Nanotwinned Metals: *Lei Lu*[1]; [1]Chinese Academy of Sciences

4:10 PM Invited
Deformation and Microstructural Evolution of Nanocrystalline Metals: *Izabela Szlufarska*[1]; Hubin Luo[2]; Yeqi Shi[1]; [1]University of Wisconsin - Madison; [2]Ningbo Institute of Materials Technology & Engineering

4:40 PM Invited
Nanomechanical Measurements in Cold Environments: *Douglas Stauffer*[1]; [1]Bruker Nano Inc.

5:10 PM
Microstructural Evolution and Mechanical Behavior of Gradient Nanostructured TWIP Steel: *Jie Ding*[1]; Zhongxia Shang[1]; Jin Li[1]; Haiyan Wang[1]; Xinghang Zhang[1]; [1]Purdue University

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

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

Monday PM
September 30, 2019

Room: C124
Location: Oregon Convention Center

Session Chairs: Navin Manjooran, Solve Technology and Research, Inc.; Gary Pickrell, Virginia Tech

2:00 PM Keynote
Nanoengineered Materials for Energy and BioMedical Systems (NEMS): *Sudipta Seal*[1]; [1]University of Central Florida

2:40 PM Invited
c-VACNT, New Nano-to-Macro Material Platform with a Rich Application Potential: *Karlheinz Strobl*[1]; Sandra Gainey[1]; [1]CVD Equipment Corporation

3:00 PM
Agglomeration of Ultra-fine Particles in Media by Acoustic Wave: *Hyo-Soo Lee*[1]; Hai-Joong Lee[1]; Hyung-Won Shin[1]; [1]Korea Institute of Industrial Technology

3:20 PM
Challenges & Solutions: New Nano-materials For Renewable Energy Applications: *Shabana Parvin Shaikh*[1]; [1]SP Pune University

3:40 PM Break

4:00 PM
Characterization of Nanophase Carbon Infused Copper Alloys and Thin Films: *Beihai Ma*[1]; Uthamalingam Balachandran[1]; Stephen Dorris[1]; Tae Lee[1]; Jie Wang[1]; Jianguo Wen[1]; Jonathan Poplawsky[2]; Adam Rondinone[2]; [1]Argonne National Laboratory; [2]Oak Ridge National Laboratory

4:20 PM
Dialysate Regeneration by Efficient Urea Decomposition with TiO2 Nanowire Photoelectrochemical Cell: *Guozheng Shao*[1]; Yushi Zang[1]; Bruce Hinds[1]; [1]University of Washington, Seattle

4:40 PM
Direct Contact Membrane Distillation (DCMD) using a Composite PVDF Electrospun Nanofiber Membrane for Water Desalination Application: *Mahmoud Baniasadi*[1]; Momena Monwar[1]; Nicholas Sutton[1]; [1]Georgia Southern University

5:00 PM Concluding Comments

Next Generation Biomaterials — Next Generation Biomaterials II

Program Organizers: Roger Narayan, University of North Carolina; Federico Rosei, INRS Centre for Energy, Materials and Telecommunications

Monday PM
September 30, 2019

Room: C122
Location: Oregon Convention Center

Session Chairs: Artemis Stamboulis, University of Birmingham; Carlos Elias, Military Institute of Engineering

2:00 PM Invited
Exposure Models in Biomedical Applications: *David Saylor*[1]; [1]U.S. Food and Drug Administration

2:20 PM
Bijels-derived Polymer-Hydrogel Hybrids for Cell Delivery: *Min Wang*[1]; Haoran Sun[1]; [1]The University of Hong Kong

2:40 PM Invited
Additive Manufacturing of Ti-6Al-4V Dental Implant: *Carlos Elias*[1]; Francielly Soares[1]; [1]Military Institute of Engineering

3:00 PM Invited
Design, Synthesis and Use of New Theranostics for the Detection and Treatment of Cancer: *Min Wang*[1]; [1]The University of Hong Kong

3:20 PM Break

3:40 PM Invited
Development of Novel Antimicrobial Orthopaedic Medical Surfaces: *Artemis Stamboulis*[1]; [1]University of Birmingham

4:00 PM Invited
Lanthanide Reinforced Hydroxyapatite Composites: Next Generation Biomaterials: *Sooraj Nandyala*[1]; Pedro Gomes[2]; Graham Hungerford[3]; L Grenho[2]; Maria Fernandes[2]; Andrew Carrod[1]; Zoe Pikramenou[1]; Artemis Stamboulis[1]; [1]University of Birmingham; [2]University of Porto; [3]HORIBA Jobin Yvon IBH Ltd

4:20 PM
Mechanically Strong and Functionalized Scaffolds Incorporated with Mesenchymal Stem Cells for Tissue Regeneration: Huihua Li[1]; *Min Wang*[1]; [1]The University of Hong Kong

4:40 PM Invited
Recycling in Laser Powder Bed Fusion (Additive Manufacturing): *Ankit Saharan*[1]; [1]EOS North America

Perspectives for Emerging Materials Professionals — Session II

Program Organizers: Christopher Marvel, Lehigh University; Andrew Frerichs, The NanoSteel Company

Monday PM
September 30, 2019
Room: B110
Location: Oregon Convention Center

Session Chairs: Christopher Marvel, Lehigh University; Jonathan Healy, Naval Surface Warfare Center - Carderock Division

2:00 PM Invited
Millions in Metallography: Artifacts and Misinterpretations: *Frederick Schmidt*[1]; [1]Advanced APPLIED Services, Inc

2:20 PM
The Greatest Failure: Finding Opportunity Where You Least Expect It: *Christopher Shumeyko*[1]; [1]US Army Research Lab

2:40 PM Invited
Increasing Retention in Women in STEM Professions: *Danielle Cote*[1]; [1]Worcester Polytechnic Institute

3:00 PM Invited
Career Navigation through Effective Communication, Utilizing Resources, and Building Your Emotional Intelligence: *Nina Abani*[1]; [1]Nissan Technical Center North America

3:20 PM Break

3:40 PM Invited
The Anathema of Networking: How Corporations and Professional Societies Have Lost Their Way: *Daniel Denis*[1]; [1]Pratt & Whitney

4:00 PM Invited
The Digital Skills Revolution in Materials Science: *Kristen Brosnan*[1]; [1]GE Global Research

4:20 PM Invited
NIST and the Materials Genome: A Personal Perspective: *James Warren*[1]; [1]National Institute of Standards and Technology

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
September 30, 2019
Room: D139
Location: Oregon Convention Center

Session Chairs: Noboru Yoshikawa, Tohoku University; Daudi R. Waryoba, Penn State DuBois

2:00 PM Invited
An Irreversible Thermodynamic Perspective on Chemical Reaction Kinetics in Ceramic Processing under Resonant Microwave-fields: *Boon Wong*; [1]

2:30 PM
Magnetic Field-assisted Electrodeposition of Nickel Composite Coatings: *Denise Yin*[1]; Heather Murdoch[1]; Efraín Hernández-Rivera[1]; Anit Giri[1]; [1]Army Research Laboratory

2:50 PM Invited
Ultrasonic and Vibration Enhanced Materials Processing: *William LaCourse*[1]; Kade McGarrity[1]; Brian Topper[1]; Holly Shulman[1]; Amit Maha[1]; Volker Geyer[1]; [1]Alfred University

3:20 PM Break

3:40 PM Invited
Effect of Alternating Electromagnetic Field on Extracellular Polymeric Substances Derived from Biofilms and Its Mechanism: *Hideyuki Kanematsu*[1]; Hidekazu Miura[2]; Dana Barry[3]; Stefan Zimmermann[4]; [1]National Institute of Technology (KOSEN), Suzuka College; [2]Suzuka University of Medical Science; [3]Clarkson University / SUNY Canton; [4]Leibniz Universität, Hannover

4:10 PM Invited
Characterization of the Native Thin Oxide Layer of Copper Metal Powder Sintered via Microwaves: *Morsi Mahmoud*[1]; [1]King Fahd University of Petroleum and Minerals

4:40 PM
Effect of Plasma Heating on the Molten Steel in Tundish: *Mengjing Zhao*[1]; Shufeng Yang[1]; Jingshe Li[1]; Xiaojun Xi[1]; Xueliang Zhang[1]; Yihang Wang[1]; Yongfeng Chen[2]; [1]University of Science and Technology Beijing; [2]Wuhu Xinxing Ductile Iron Pipes Co.,Ltd.

5:00 PM
Field-Assisted Processing of SiC-Diamond Composite Blends: *Michael Kornecki*[1]; Selva Raju[2]; Raymond Brennan[1]; [1]U.S. Army Research Laboratory; [2]ORAU

PSDK XIV: Phase Stability and Diffusion Kinetics — Gibbs: Phase Equilibria, Diffusion and Materials Design

Program Organizers: Michael Gao, National Energy Technology Laboratory; Hans Seifert, Karlsruhe Institute of Technology; Zi-Kui Liu, Pennsylvania State University; Fan Zhang, CompuTherm LLC; Richard Otis, Jet Propulsion Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory

Monday PM
September 30, 2019
Room: E144
Location: Oregon Convention Center

Session Chairs: Aurelien Perron, Lawrence Livermore National Laboratory; Wei Xiong, University of Pittsburgh

2:00 PM Invited
Genomic Materials Design: From CALPHAD to Flight: *Gregory Olson*[1]; [1]Northwestern University

2:20 PM Invited
CALPHAD-based ICME Design for Additive Manufacturing: Case Studies with Success and Challenges: *Wei Xiong*[1]; Albert To[1]; [1]University of Pittsburgh

2:40 PM Invited
Thermodynamic Modeling of Al-Ce Alloys: Predicting Phase Stability for Alloy Design: *Emily Moore*[1]; Aurélien Perron[1]; [1]Lawrence Livermore National Laboratory

3:00 PM Invited
Metastable Dendrite Morphologies in Impulse Atomized Droplets of Al-alloys: *Hani Henein*[1]; Jonas Valloton[1]; Abdoul-Aziz Bogno[1]; [1]University of Alberta

3:20 PM Invited
Estimation of Measurement Uncertainty in Solid State Diffusion: *Jeffrey LaCombe*[1]; [1]University of Nevada

3:40 PM Break

4:00 PM Invited
Phase Equilibria and Interfacial Migration in Palladium Hydrogen Alloys: Nicholas Weadock[1]; *Peter Voorhees*[2]; Brent Fultz[1]; [1]California Institute of Technology; [2]Northwestern University

4:20 PM Invited
Accelerated Design of Gamma-TiAl Alloys by High Throughput Calculation: *Fan Zhang*[1]; Jun Zhu[1]; Chuan Zhang[1]; John Foltz[1]; [1]CompuTherm LLC

4:40 PM Invited
Using CALPHAD Approaches to Control Additive Manufactured Microstructures and Properties: *Carelyn Campbell*[1]; [1]National Institute of Standards & Technology

5:00 PM Invited
Plutonium Phase Diagrams in the New Edition of the Plutonium Handbook: Experiments and Theory: *Aurelien Perron*[1]; Patrice Turchi[1]; [1]Lawrence Livermore National Laboratory

Substrate Protection for Corrosion Prevention — Session II

Program Organizers: Mary Lyn Lim, PPG Industries; Qixin Zhou, The University of Akron; Niamh Hosking, Ford Motor Company; Matthew Asmussen, Pacific Northwestern National Laboratory; Elissa Trueman, NSWC Carderock Division; Cortney Crane, Exponent Failure Analysis Associates; Stephen Raiman, Oak Ridge National Laboratory; Raul Rebak, GE Global Research

Monday PM
September 30, 2019
Room: B118
Location: Oregon Convention Center

Session Chairs: Mary Lyn Lim, PPG; Cortney Crane, Exponent Failure Analysis Associates; Qixin Zhou, The University of Akron

2:00 PM
Noise Introduced by Polishing Effects on Corrosion Potential — An Optimization by Robust Design: *Evan Huang*[1]; Fred Goodwin[1]; [1]BASF Construction Chemicals

2:20 PM
Characterization of Recycled High Density Polyethylene (HDPE) Coating on Mild Steel: *AHM Rahman*[1]; Issam Abu-Mahfouz[1]; Ma'moun Abu-Ayyad[1]; Joshua Bachert[1]; [1]Pennsylvania State University, Harrisburg

2:40 PM
Effect of Shot-peening on Oxidation of Stainless Steel 304H in Steam: *James Kurley*[1]; Bruce Pint[1]; [1]Oak Ridge National Laboratory

3:00 PM
Evolution of Pretreatment Technology for Light-Weighting and Environmentally Friendly Substrate Protection: *Julia Heigl*[1]; [1]PPG

3:20 PM Break

3:40 PM
Investigation of Modified Cardanol as Reactive Diluents for Zinc Phosphate Pigmented Alkyd Coating: *Haoran Wang*[1]; Qixin Zhou[1]; [1]University of Akron

4:00 PM
An Assessment on the Effects of Lecaniodiscus Cupaniodes Extract and Normalizing Temperature in Corrosion Behaviour of Mild Steel in 0.5 M HCL: *Olufunmilayo Joseph*[1]; Olugbenga Omotosho[1]; Modupe Ojewumi[1]; Roland Loto[1]; [1]Covenant University

Surface Properties of Biomaterials — Cell-Biomaterial Interactions

Program Organizers: Ryan Bock, SINTX Technologies; Jason Langhorn, DePuy Synthes Joint Reconstruction; Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University; Mangal Roy, Indian Institute of Technology-Kharagpur; Venu Varanasi, University of Texas at Arlington

Monday PM
September 30, 2019
Room: C121
Location: Oregon Convention Center

Session Chairs: Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University; Ryan Bock, SINTX Technologies

2:00 PM Invited
Biological Applications of Nanoscale Janus Particles with Dual Biofunctionalization: *Michael Maas*[1]; Reshma Kadam[1]; Kurosch Rezwan[1]; [1]University of Bremen

2:40 PM Invited
Interaction between Graphene Surfaces and Extracellular Polymeric Substances of Biofilms: *Hideyuki Kanematsu*[1]; Ryoichi Nakagawa[1]; Dana Barry[2]; Katsuhiko Sano[3]; Masatou Ishihara[4]; Masahito Ban[5]; Noriyuki Wada[1]; Nobumitsu Hirai[1]; Akiko Ogawa[1]; Takeshi Kogo[1]; Daisuke Kuroda[1]; [1]National Institute of Technology (KOSEN), Suzuka College; [2]Clarkson University / SUNY Canton; [3]D & D Corporation; [4]National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan; [5]Nippon Institute of Technology

3:20 PM Break

3:40 PM
The Importance of Base Plate to Barnacle Adhesion: *Heonjune Ryou*[1]; Andrew Geltmacher[2]; Richard Everett[3]; James Wollmershauser[2]; Kathryn Wahl[2]; [1]ASEE Postdoc cited at US Naval Research Laboratory; [2]US Naval Research Laboratory; [3]University of Maryland Baltimore County

4:00 PM
Time Lapse in Vitro Vibrational Spectroscopic Assessment of Antibacterial Activity of Oxide and Nitride Bioceramics Used in Implantable Medical Devices: Francesco Boschetto[1]; *Ryan Bock*[2]; Bryan McEntire[2]; Tetsuya Adachi[3]; Elia Marin[3]; Wenliang Zhu[4]; Osam Mazda[3]; B. Sonny Bal[2]; Giuseppe Pezzotti[1]; [1]Kyoto Institute of Technology; [2]SINTX Technologies; [3]Kyoto Prefectural University of Medicine; [4]Osaka University

4:20 PM
Fe-Mn-Cu Alloy as a Novel Antibacterial Biodegradable Material: *Santanu Mandal*[1]; Mangal Roy[1]; [1]Metallurgical and Materials Engineering Department, IIT Kharagpur

4:40 PM
Preparation of Anatase-type Titanium Dioxide Having Strong Antibacterial Activity under Dark Conditions: Ken Hirota[1]; *Phuong Nguyen*[1]; Masaki Kato[1]; Kazuhiko Tsukagoshi[1]; Atsuki Terabe[2]; Hideto Mizutani[2]; [1]Doshisha University; [2]Sakai Chemical Industry Co., Ltd.

5:00 PM
Effect of Transition Metal Doping Sites on Biological Properties of Hydroxyapatite: Arjak Bhattacharjee[1]; Anshul Gupta[1]; Madhu Verma[1]; Prem Murugan[1]; *Pradyut Sengupta*[2]; Saravanan Matheshwaran[1]; Indranil Manna[3]; Kantesh Balani[1]; [1]IIT Kanpur; [2]CSIR-IMMT; [3]IIT Kharagpur

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

Program Organizers: Kyle Brinkman, Clemson University; Kristina Lilova, University California Davis; Alexandra Navrotsky, University California Davis; Jake Amoroso, Savannah River National Laboratory; Fei Peng, Clemson University; Xingbo Liu, West Virginia University; Gustavo Costa , NASA; Xiaofeng Guo, Washington State University

Monday PM
September 30, 2019

Room: B119
Location: Oregon Convention Center

Session Chair: Xiaofeng Guo, Washington State University

2:00 PM Invited
Measurement of Molten Salt Properties at Operationally Relevant Temperatures: *Wilson Chiu*[1]; [1]University Of Connecticut

2:30 PM Invited
Molecular Modeling and Simulation of Molten Salts: Progress from the Molten Salts in Extreme Environments (MSEE) Energy Frontier Research Center: *Edward Maginn*[1]; Vyacheslav Bryantsev[2]; Matthew Emerson[3]; Claudio Margulis[3]; Santanu Roy[2]; Shobha Sharma[3]; Haimeng Wang[1]; Fei Wu[3]; Yong Zhang[1]; [1]University of Notre Dame; [2]Oak Ridge National Laboratory; [3]University of Iowa

3:00 PM Invited
Determination of Thermodynamic Data at High Temperatures with Knudsen Effusion Mass Spectrometry: *Torsten Markus*[1]; David Henriques[1]; [1]Hochschule Mannheim

3:30 PM Break

3:50 PM
Phase Equilibria for Uranium- Silicide Nuclear Fuel: *Tashiema Wilson*[1]; Denise Lopes[1]; Theodore Besmann[1]; Joshua White[2]; Sven Vogel[2]; [1]University of South Carolina; [2]Los Alamos National Laboratory

4:10 PM
Chemical Short-Range Order Stabilizes Hollandite Phases for Nuclear Waste Form Applications: Robert Koch[1]; Deepak Patil[1]; Jake Amoroso[2]; Kyle Brinkman[3]; Mingyang Zhao[3]; *Scott Misture*[1]; [1]Alfred University; [2]Savannah River National Laboratory; [3]Clemson University

4:30 PM
The Impact of Cs Stoichiometry on Structural Features and Thermodynamic Stability of (BaxCsy)(M,Ti)8O16 (M = Zn2+, Al3+, Ga3+, and Fe3+) Hollandite-based Ceramic Waste Forms: *Mingyang Zhao*[1]; Jake Amoroso[2]; Rob Grote[1]; Kyle Brinkman[1]; [1]Clemson University; [2]Savannah River National Laboratory

Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications — Titanium, Aluminum and Hierarchical Materials

Program Organizers: Ali Yousefiani, Boeing Research And Technology; Troy Topping, California State University, Sacramento; Robert Dillon, NASA Jet Propulsion Laboratory; Linruo Zhao, National Research Council of Canada

Monday PM
September 30, 2019

Room: D140
Location: Oregon Convention Center

Session Chair: Troy Topping, California State University, Sacramento

2:00 PM Invited
Hierarchical Nanoporous Metals: *Kaka Ma*[1]; [1]Colorado State University

2:40 PM
Titanium Alloys with Radially Distributed Porosity and Structural Hierarchy: *Alexander Preston*[1]; Kaka Ma[1]; [1]Colorado State University

3:00 PM
In-situ Studies of Strain Rate Effects on Phase Transformations and Microstructural Evolution in ß-Titanium: *Benjamin Ellyson*[1]; Amy Clarke[1]; Jonah Klemm-Toole[1]; Yaofeng Guo[1]; Jinling Gao[2]; Wayne Chen[2]; Niranjan Parab[3]; Kamel Fezzaa[3]; Tao Sun[3]; [1]Colorado School of Mines; [2]Purdue; [3]Advanced Photon Source

3:20 PM Break

3:40 PM
Role of Cu Content in Determining the Mechanical Behavior of Cast Al-Cu-Mn-Zr Alloys: *Sumit Bahl*[1]; Jiahao Cheng[1]; Xiaohua Hu[1]; Allen Haynes[1]; Amit Shyam[1]; [1]Oak Ridge National Laboratory

4:00 PM
Development of Novel Castable Structural Aluminum Alloys for Elevated Temperature Applications: *Joseph Jankowski*[1]; Jonathan Miorelli[1]; Malavikha Rajivmoorthy[1]; Mark Eberhart[1]; Amy Clarke[1]; Michael Kaufman[1]; Paul Wilson[2]; Krish Krishnamurthy[3]; [1]Colorado School of Mines; [2]Boeing; [3]Honeywell

4:20 PM
Outstanding Fracture Toughness and Fatigue Strength of a Cast Al-Cu Alloy Promoted by Nanoparticles: *Qinglong Zhao*[1]; Xiao Liu[1]; Qichuan Jiang[1]; [1]Jilin University

Undergraduate Global University — What to Expect Post Bachelor's Degree II

Program Organizers: Kelley Wilkerson, Missouri University of Science and Technology; Dana Goski, Allied Mineral Products; James Hemrick, Reno Refractories Inc.; Eva Hemmer, University of Ottawa

Monday PM
September 30, 2019
Room: A103
Location: Oregon Convention Center

Session Chair: Kelley Wilkerson, Missouri University of Science and Technology

2:00 PM Introductory Comments

2:20 PM Panel Discussion

MS&T19 Plenary Session

Tuesday AM
October 1, 2019
Room: Portland Ballroom 251/257/258
Location: Oregon Convention Center

8:00 AM Introductory Comments

8:10 AM Plenary
ASM/TMS Distinguished Lectureship in Materials and Society: The Challenge of 100 Year Service-life Requirement: *Carolyn Hansson*[1]; [1]University of Waterloo

8:50 AM Award Presentation

8:55 AM Introductory Comments

9:00 AM Plenary
ACerS Edward Orton, Jr. Memorial Lecture: Glass and Water: Fast Surface Relaxation: *Minoru Tomozawa*[1]; [1]Rensselaer Polytechnic Institute

9:40 AM Award Presentation

9:45 AM Introductory Comments

9:50 AM Plenary
AIST Adolf Martens Memorial Steel Lecture: The Fascinating Variety of New Manganese Alloyed Steels: *Wolfgang Bleck*[1]; [1]IEHK Steel Institute of RWTH Aachen University

10:30 AM Award Presentation

11th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Novel Materials Design for Sustainable Society

Program Organizers: Surojit Gupta, University of North Dakota; Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technololgy; John Wolodko, University of Alberta; Christopher Taylor, DNV GL; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin; 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
October 1, 2019
Room: Portland Ballroom 255
Location: Oregon Convention Center

Session Chairs: Surojit Gupta, University of North Dakota; Manabu Fukushima, National Institute of Advanced Industrial Science and Technology

2:00 PM Invited
Why Soft Processing(=Low-Energy Production) of Advanced Materials is Difficult but Necessary for Sustainable Society?: *Masahiro Yoshimura*[1]; [1]National Cheng Kung University

2:30 PM Invited
Carbonate Ceramics for the Reduction of Global Carbon Footprint: *Richard Riman*[1]; Daniel Kopp[1]; [1]Rutgers, The State University of New Jersey

3:00 PM
Toward Reclamation of Fibrous Waste Stream Materials: *Marlann Patterson*[1]; [1]University of Wisconsin, Stout

3:20 PM Invited
Explore Bio-inspired Cement Using Large-scale Computational Modeling: *Wai-Yim Ching*[1]; [1]University of Missouri

3:40 PM
Precipitating Rare Earths from Industrial Solutions: *Paul Kim*[1]; Angela Arpino[1]; Gaurav Das[2]; Malgorzata Lencka[2]; Andre Anderko[2]; Richard Riman[1]; [1]Rutgers University; [2]OLI Systems, Inc.

4:00 PM
Translating Design Strategies from Permaculture to Materials Manufacturing and Processing: *Christopher Taylor*[1]; Sarah Taylor[2]; [1]Dnv Gl; [2]Jedidiah Farm and Studio

ACerS Frontiers of Science and Society - Rustum Roy Lecture

Tuesday PM
October 1, 2019
Room: Portland Ballroom 253
Location: Oregon Convention Center

1:00 PM Invited
Printing Architected Matter in Three Dimensions: *Jennifer Lewis*[1]; [1]Harvard University

Actinide and Lanthanide Materials III — Fuels

Program Organizers: Clarissa Yablinsky, Los Alamos National Laboratory; Ryan Stillwell, Lawrence Livermore National Laboratory; Kester Clarke, Colorado School of Mines; Clinique Brundidge, Naval Nuclear Laboratory; Adam Farrow, Los Alamos National Laboratory; Curt Lavender, Battelle - Pacific Northwest National Laboratory; Douglas Burkes, Pacific Northwest National Laboratory

Tuesday PM
October 1, 2019

Room: C120
Location: Oregon Convention Center

Session Chairs: Clarissa Yablinsky, Los Alamos National Laboratory; Ryan Stillwell, Lawrence Livermore National Laboratory

2:00 PM Invited
Constituent Redistribution and Lanthanide Migration in Neutron Irradiated Uranium Zirconium Fuel: *Maria Okuniewski*[1]; Jonova Thomas[1]; Walter Williams[1]; Lingfeng He[2]; Xiang Liu[2]; [1]Purdue University; [2]Idaho National Laboratory

2:30 PM
Carbon Uptake during the Processing of Uranium: *Kara Luitjohan*[1]; Seth Imhoff[1]; [1]Los Alamos National Laboratory

2:50 PM
Influence of Divergency and Initiation Site on Kinetics of Cellular Growth and Coarsening in Aged U-Nb Alloys: *Robert Hackenberg*[1]; Megan Emigh[1]; Pallas Papin[1]; Ann Kelly[1]; Robert Forsyth[1]; Tim Tucker[1]; Kester Clarke[2]; [1]Los Alamos National Laboratory; [2]Colorado School of Mines

3:10 PM
Developing Internal Friction Capabilities for Defect Characterization in Actinides: *Taylor Jacobs*[1]; Clarissa Yablinsky[1]; Meghan Gibbs[1]; Franz Freibert[1]; Tarik Saleh[1]; [1]Los Alamos National Laboratory

3:30 PM
High-resolution Temperature-Dependent Elastic Property Measurements of Nuclear Fuels using Resonant Ultrasound Spectroscopy: *Jordan Evans*[1]; Ursula Carvajal[1]; Jonathan Betts[1]; Joshua White[1]; Tarik Saleh[1]; David Frazer[1]; Boris Maiorov[1]; [1]Los Alamos National Laboratory

3:50 PM
Moduli Measurements of Various Fuel and Nuclear Materials Measured at Ambient Temperatures: *Tarik Saleh*[1]; Stephen Parker[1]; Aditya Shivprasad[1]; David Frazer[1]; Ursula Carvajal-Nunez[1]; Meghan Gibbs[1]; John Dunwoody[1]; Joshua White[1]; [1]Los Alamos National Laboratory

4:10 PM
A6W4Al43 : A New Caged-host for U and Pu: *Kevin Huang*[1]; William Nelson[2]; Alexander Chemey[3]; Thomas Albrecht-Schmitt[3]; Ryan Baumbach[2]; [1]Lawrence Livermore National Laboratory; [2]National High Magnetic Field Laboratory; [3]Florida State University

Additive Manufacturing of Glass, Ceramics and Composites — Additive Manufacturing of Glass, Ceramics and Composites III

Program Organizers: Tobias Schaedler, Hrl Laboratories Llc; Matthew Dickerson, Air Force Research Laboratory; Rebecca Dylla-Spears, Lawrence Livermore National Laboratory; Chang-Jun Bae, Korea Institute of Materials Science (KIMS)

Tuesday PM
October 1, 2019

Room: B113
Location: Oregon Convention Center

Session Chair: Rebecca Dylla-Spears, Lawrence Livermore National Laboratory

2:00 PM Invited
Additive Manufacturing as an Enabler for Complex, Multi-scale Ceramic Armors: *Lionel Vargas-Gonzalez*[1]; Nicholas Ku[1]; Joshua Pelz[2]; Andrew Rosenberger[1]; Carli Marsico[3]; Ryan Dunn[1]; [1]Army Research Laboratory; [2]University of California San Diego; [3]University of Washington

2:30 PM
Multi-material Additive Manufacturing for Functional Design in Next-generation Ceramic Composites: *Joshua Pelz*[1]; Nicholas Ku[2]; Taylor Shoulders[2]; Lionel Vargas Gonzalez[2]; Marc Meyers[1]; [1]University of California, San Diego; [2]US Army Research Laboratory

2:50 PM
Unlocking Ceramic Microstructure Control through Additive Manufacturing: *Andrew Rosenberger*[1]; Nicholas Ku[1]; Lionel Vargas-Gonzalez[1]; [1]Army Futures Command

3:10 PM
Additive Manufacturing of Silicon Carbide via a Continuous Extrusion Method: *Adam Bratten*[1]; Maalavan Arivu[1]; Haiming Wen[1]; Ming Leu[1]; [1]Missiouri University of Science & Technology

3:30 PM
Ceramic Spinodal Nanoarchitectures with Superior Energy Absorption Capability: *Anna Guell Izard*[1]; Cameron Crook[1]; Jens Bauer[1]; Lorenzo Valdevit[1]; [1]University of California, Irvine

3:50 PM
3D-printing of Oxide-based Ceramic Porous Material Using Stereolithography: *Axel Dieraert*[1]; Bruno Pintault[1]; Clement Sanchez[2]; Philippe Belleville[1]; [1]CEA Le Ripault; [2]Université Pierre et Marie Curie (Paris VI)

4:10 PM
Complex Porous Ceramic Architectures Produced by Additive Manufacturing: Design, Production, Testing and Applications: *Alberto Ortona*[1]; [1]University of Applied Sciences and Arts of Southern Switzerland

4:30 PM
Aerosol Deposition Method: Influence of Deposition Velocity on SiC Film Density: *Derek Davies*[1]; Desiderio Kovar[1]; Michael Becker[1]; John Keto[1]; [1]University of Texas at Austin

4:50 PM
Forming of Net-shape, Porous Zirconia Structures for Shape Memory Applications: *Corson Cramer*[1]; Peeyush Nandwana[1]; Beth Armstrong[1]; Patrick Geoghegan[1]; [1]Oak Ridge National Laboratory

Additive Manufacturing of Metals: Microstructure and Material Properties of Nickel-based Alloys — Microstructure and Properties of Alloy 718

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

Tuesday PM
October 1, 2019
Room: B117
Location: Oregon Convention Center

Session Chair: Timothy Horn, North Carolina State University

2:00 PM
Multiscale Characterization of Microstructures and Mechanical Properties of Inconel 718 Fabricated by Selective Laser Melting: *Sharniece Holland*[1]; Xiaoqing Wang[2]; Jia Chen[3]; Wenjun Cai[3]; Feng Yan[4]; Lin Li[4]; [1]Auburn University; [2]Jacksonville State University; [3]Virginia Polytechnic Institute and State University; [4]The University of Alabama

2:20 PM
Microstructure Stability of Inconel 718 in the Laser Powder Bed Fusion Process as a Function of Geometrical Features and Process Parameters: *John Sions*[1]; Melissa Tsui[1]; Kyle Snyder[1]; Richard Martukanitz[1]; Cameron Gygi[1]; [1]Commonwealth Center for Advanced Manufacturing

2:40 PM
Microstructural Evolution of IN718 Alloy Manufactured by Selective Laser Melting under Different Stress Conditions: *Zhen Xu*[1]; Chuan Guo[1]; Zhengrong Yu[1]; Xin Li[1]; Xiaogang Hu[1]; Qiang Zhu[1]; [1]Southern University of Science and Technology

3:00 PM
Parametric Study of Microstructure Formation of Quasi-Continuous-Wave Laser Additive Manufactured Inconel 718: *Zhaoyang Liu*[1]; Qiang Zhu[1]; Lijun Song[1]; [1]Southern University of Science and Technology

3:20 PM
Phase Field Model Development for Prediction of Microstructure in IN718 Alloy during Additive Manufacturing and Heat Treatment: Balasubramaniam Radhakrishnan[1]; *Ranadip Acharya*[2]; [1]Oak Ridge National Laboratory; [2]United Technologies Research Center

3:40 PM
Influence of Pulsing Rate on the Solidification Behaviour and Microstructure in Direct Laser Deposition of IN718: *Stano Imbrogno*[1]; Abdullah Alhuzaim[1]; Moataz Attallah[1]; [1]University of Birmingham

4:00 PM
Influence of Contour Parameters on the Surface Characteristics and Geometrical Accuracy of EB-PBF Built Alloy 718: *Paria Karimi*[1]; Christopher Schnur[1]; Esmaeil Sadeghi[1]; Joakim Ålgårdh[1]; Joel Andersson[1]; [1]University West

4:20 PM
Multiscale Modeling Framework for the Selective Laser Melting Process Applied to Inconel 718: *Scott Peters*[1]; Arshad Chowdhury[1]; Antoinette Maniatty[1]; Steve Rock[1]; Daniel Lewis[1]; [1]Rensselaer Polytechnic Institute

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing of Novel Materials

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

Tuesday PM
October 1, 2019
Room: B115
Location: Oregon Convention Center

Session Chair: Ulf Ackelid, Freemelt AB

2:00 PM Invited
Selective Laser Melting of Co–Cr–Mo Alloys: *Zhi Wang*[1]; [1]South China University of Technology

2:30 PM
In-situ Alloying of FeNiCrCoMn High Entropy Alloy Using Selective Laser Melting: *Peng Chen*[1]; Moataz Attallah[1]; Ming Yang[2]; [1]University of Birmingham; [2]South China University of Technology (Sustech)

2:50 PM
Anisotropic Mechanical Response of Equiatomic CoCrFeMnNi High-entropy Alloy Additively Manufactured by Selective Laser Melting: *Young-Kyun Kim*[1]; Jungho Choe[2]; Kee-Ahn Lee[1]; [1]Inha University; [2]Korea Institute of Materials Science (KIMS)

3:10 PM
Direct Laser Deposition of Cobalt-free High-entropy Alloys: *Maalavan Arivu*[1]; Matthew Luebbe[1]; Wenyuan Cui[1]; Frank Liou[1]; Haiming Wen[1]; [1]Missouri University of Science and Technology

3:30 PM
Developing a High Throughput Screening Method for Mg-based Metallic Glasses: *Janine Erickson*[1]; Dan Thoma[1]; John Perepezko[1]; [1]University of Wisconsin-Madison

3:50 PM
Design of Novel Fe-based BMGs for Improved Additive Manufacturing Processability: *Zaynab Mahbooba*[1]; Abhinav Saboo[1]; Jiayi Yan[2]; Martin Walbruhl[2]; Ida Berglund[1]; [1]QuesTek Innovations; [2]QuesTek Europe

4:10 PM
Molybdenum-titanium Alloy Development for Directed Energy Deposition Additive Manufacturing: *Michael Niezgoda*[1]; Dan Thoma[1]; John Perepezko[1]; [1]University of Wisconsin - Madison

4:30 PM
Microstructural Characterization of Laser Powder Bed Fused WE43 Magnesium Alloy: *Holden Hyer*[1]; Le Zhou[1]; Brandon McWilliams[2]; Kyu Cho[2]; Yongho Sohn[1]; [1]University of Central Florida; [2]US Army Research Laboratory

4:50 PM
Predictive Process Parameter Selection for Laser Powder Bed Fusion Manufacturing: Applications to High Thermal Conductivity Alloys: *Priyanshu Bajaj*[1]; Jonathan Wright[2]; Iain Todd[2]; Eric Jaegle[1]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]The University of Sheffield

Additive Manufacturing of Metals: Post Processing — HIP and Heat Treatment I

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

Tuesday PM
October 1, 2019

Room: B110
Location: Oregon Convention Center

Session Chair: Ola Harrysson, North Carolina State University

2:00 PM
Use of Hot Isostatic Pressing Treatments to Manipulate Defect Content, Microstructure, Tensile Properties and Fracture Toughness in Additively Manufactured Ti-6Al-4V Parts: *Jake Benzing*[1]; Nik Hrabe[1]; Enrico Lucon[1]; Ryan White[1]; Magnus Ahlfors[2]; [1]National Institute of Standards and Technology; [2]Quintus Technologies

2:40 PM
Influence of Thermal Treatments on Microstructure, Hardness and Mechanical Properties of AlSi10Mg Alloy Processed by Selective Laser Melting: *Elisa Padovano*[1]; Anna Pantarelli[1]; Fabio D'Aiuto[2]; Claudio Badini[1]; [1]Politecnico di Torino; [2]Centro Ricerche Fiat

3:00 PM
Microstructure and Properties of Additive Laser Powder Bed Fusion Processed and Heat-treated IN625 Alloy: *Aruneshwar Somasundaram*[1]; Jie Song[1]; Micheal Kattoura[1]; Seetha Rammiah Mannava[1]; Vijay Vasudevan[1]; [1]University of Cincinnati

3:20 PM
The Role of Nitrogen in Laser-powder Bed Fusion (L-PBF) and Hot-isostatic Pressing (HIP) of High-alloyed Austenitic Stainless Steels: *Johannes Boes*[1]; Arne Röttger[1]; Werner Theisen[1]; [1]Ruhr University Bochum

3:40 PM
Effect of HIP & Heat Treatment on the Stitched Zones of Inconel 718 Printed by Multi Laser PBF-L: *Jacob Rindler*[1]; Connor Slone[1]; Edward Herderick[1]; Antonio Ramirez[1]; [1]Ohio State University

Additive Manufacturing: In-situ Process Monitoring and Control — Modeling Methods

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

Tuesday PM
October 1, 2019

Room: B112
Location: Oregon Convention Center

Session Chair: Sudarsanam Babu, University of Tennessee, Knoxville

2:00 PM
A Framework and Demonstration for Machine-agnostic Feedforward Control on Commercial Powder Bed Fusion Systems: *Christopher Stutzman*[1]; Abdalla Nassar[1]; Jeffrey Irwin[1]; Qian Wang[1]; Panagiotis Michaleris[2]; [1]The Pennsylvania State University; [2]Autodesk

2:20 PM
Active Monitoring of the Selective Laser Melting Process Using an Artificial Neural Net Classifier on Layer-by-layer Surface Profile Data: *Benjamin Terry*[1]; Brandon Baucher[2]; Anil Chaudhury[2]; Subhadeep Chakraborty[1]; [1]University of Tennessee; [2]Applied Optimization

2:40 PM
AM Process Control Using a Machine Learning Approach: *Kilian Wasmer*[1]; [1]Empa

3:00 PM
Multiscale and Multiphysics Certification in Additive Manufacturing Using Real-time Sensor Data and Simulation Outcomes: *Deepankar Pal*[1]; Madhu Keshavamurthy[1]; [1]ANSYS

3:20 PM
Process Control for Additive Manufacturing of Metallic Functionally Graded Materials: *Frederick Lia*[1]; Jayme Keist[1]; Sanjay Joshi[1]; Rich Martukanitz[2]; [1]Penn State; [2]Commonwealth Center for Advanced Manufacturing (CCAM)

3:40 PM
Process Monitoring and Closed Loop Control of Robotized Laser Powder Directed Energy Deposition: *Meysam Akbari*[1]; Radovan Kovacevic[1]; [1]Southern Methodist University

4:00 PM
Spatial Statistical Methods for Real-time Crystallographic Grain Growth Reconstruction in Rapidly Solidified Alloys: *Nathan Johnson*[1]; Branden Kappes[1]; Don Brown[2]; John Carpenter[2]; Aaron Stebner[1]; [1]Colorado School of Mines; [2]Los Alamos National Laboratory

Additive Manufacturing: Microstructure and Material Properties of Titanium-based Alloys — Laser Powder Bed Fusion - Session I

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

Tuesday PM
October 1, 2019

Room: B116
Location: Oregon Convention Center

Session Chair: Ola Harrysson, North Carolina State University

2:00 PM
Analysis of Hatch-contour Interfacial Angle Influence on Defect Formation in Ti–6Al–4V: *Brett Diehl*[1]; Abdalla Nassar[1]; Anil Chaudhary[2]; Brandon Baucher[2]; [1]Pennsylvania State University; [2]Applied Optimization

2:20 PM
Laser Powder Bed Fusion of Hydride-Dehydride Ti-6Al-4V Powder: *Amir Mostafaei*[1]; Ziheng Wu[1]; Nihal Sivakumar[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

2:40 PM
Modeling Rapid Solidification Microstructures in Laser-melted TiNb Alloys: *Joel Berry*[1]; Aurelien Perron[1]; Jean-Luc Fattebert[2]; Joseph Mckeown[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory; [2]Oak Ridge National Laboratory

3:00 PM
Multiple Strategies for Microstructural Control during Selective Laser Melting of a Beta Titanium Alloy: *Chunlei Qiu*[1]; [1]Beihang University

3:20 PM
Comparing Spherical and Irregular Powders in the Selective Laser Melting of Ti-53%Nb Alloy: Jhoan Sebastian Guzman Hernandez[1]; Rafael Nobre[1]; Enzo Nunes[1]; Daniel Bayerlein[2]; Railson Falcão[2]; Edwin Leva[2]; João Ferreira Neto[3]; Henrique Oliveira[4]; Victor Chastinet[4]; *Fernando Gomes Landgraf*[1]; [1]University of Sao Paulo; [2]Institute for Technological Research; [3]Brazilian Metallurgy and Mining Company; [4]National Service for Industrial Training

Additive Manufacturing: Solid-state and Other Nonbeam-based Technologies for the Manufacturing of Metallic Parts — AM by Wire Arc and Plasma Melting Methods

Program Organizers: Olaf Andersen, Fraunhofer Society; J. Brian Jordon, University of Alabama; Orlando Rios, Oak Ridge National Laboratory; Paul Allison, University of Alabama; Mark Norfolk, Fabrisonic LLC; Luke Brewer, University of Alabama

Tuesday PM
October 1, 2019

Room: B114
Location: Oregon Convention Center

Session Chair: Paul Allison, University of Alabama

2:00 PM Invited
Manipulating Mechanical Properties of WAAM Deposited ER70S-6 Steel by Forced Cooling: *Michael Maughan*[1]; Andre Corpus[1]; [1]University of Idaho

2:20 PM
Investigating the Mechanical, Micro-structural, Corrosion and Fracture Performances of a New Steel Composition, Produced by Tandem WAAM Mixing of (2.25Cr-1Mo and MoNiCr) Type Steel Wires: *Osahon Ehigiator*[1]; Supriyo Ganguly[1]; Filomeno Martina[1]; [1]Cranfield University

2:40 PM Invited
Optimization of Mg-Zn-Ca WAAM Process Parameters by Machine Learning: *Raja A*[1]; Nishtha Vaidya[1]; Jayaganthan R[1]; Murugaiyan Amirthalingam[1]; Abhishek Tiwari[1]; [1]Indian Institute of Technology Madras

3:00 PM
Aluminum-cerium Alloy Bead Shape Retention in Direct Metal Write Additive Manufacturing: *Max Neveau*[1]; Michael Kesler[1]; Hunter Henderson[1]; Tian Li[2]; Andrew Pascall[2]; Zachary Sims[1]; Michael Thompson[1]; William Carter[1]; Scott McCall[2]; Orlando Rios[1]; [1]Oak Ridge National Laboratory; [2]Lawrence Livermore National Laboratory

3:20 PM
Jetting of High Temperature Metals Using the Novel Droplet-on-demand Technology "MetalJet": Interfaces between Dissimilar Materials in Multi-material Printing: *Nesma Aboulkhair*[1]; Marco Simonelli[1]; Mark East[1]; Richard Hague[1]; [1]University of Nottingham

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; Arif Mubarok, PPG; Mary Lyn Lim, PPG Industries

Tuesday PM
October 1, 2019

Room: B118
Location: Oregon Convention Center

Session Chairs: Evelina Vogli, LM Group Holdings Inc.; Fei Tang, DNV GL USA, Inc.

2:00 PM Invited
Structurally Integrated Damage Tolerant Thermal Spray Coatings: *Sanjay Sampath*[1]; [1]Stony Brook University

2:40 PM
Functional Martensitic Stainless Steel Coatings by Cold Spray: *Jonghyun Lee*[1]; Cal Wong[1]; Morotolaoluwa Alabi[2]; Christian Widner[3]; Dennis Helfritch[4]; Victor Champagne[4]; [1]Iowa State University; [2]South Dakota School of Mines and Technology; [3]VRC Metal Systems; [4]The U.S. Army Research Laboratory

3:00 PM
Microstructure Evaluation and Corrosion Behavior of Cold Spray Deposited Tantalum Coating: *Pankaj Kumar*[1]; Bhaskar Vadlamani[1]; Arpith Siddaiah[1]; Prasad Kalvala[1]; Pradeep Menezes[1]; Reza Daroonparvar[2]; Charles Kay[2]; Mano Misra[1]; [1]University of Nevada, Reno; [2]ASB Industries, Inc.

3:20 PM
Novel HVOF-Deposited Coating Using Recycled WC Powders: *Johanna Meier*[1]; Gary Fisher[1]; [1]InnoTech Alberta

3:40 PM
Process-induced Variability in the Corrosion Response of Thermally Sprayed Coatings: *Edward Gildersleeve*[1]; Sanjay Sampath[1]; [1]Center for Thermal Spray Research

4:00 PM
Development of Environmentally-friendly Corrosion Coatings: *Christophe Grenier*[1]; Tsukasa Mizuhara[1]; [1]PPG Industries

4:20 PM
Corrosion Behaviour and Microstructural Study of TiZnNi Laser Deposited on Titanium Alloy: *Olawale Fatoba*[1]; Stephen Akinlabi[1]; Esther Akinlabi[1]; [1]University of Johannesburg

Advanced High Strength Steels / From Design to End Users — Steel Processing & Applications

Program Organizers: Alla Sergueeva, NanoSteel Company Inc.; Daniel Branagan, The NanoSteel Company

Tuesday PM
October 1, 2019

Room: C124
Location: Oregon Convention Center

Session Chairs: Lawrence Cho, National Institute of Standards and Technology; Alla Sergueeva, NanoSteel Company Inc.

2:00 PM Keynote
Strengthening of 3rd Generation AHSS during Cold Stamping: *Daniel Branagan*[1]; Craig Parsons[1]; Tad Machrowicz[1]; Jonathan Cischke[1]; Andrew Frerichs[1]; Brian Meacham[1]; Sheng Cheng[1]; Alla Sergueeva[1]; [1]NanoSteel Company Inc

2:40 PM
Approach for Developing Ultra High Strength Fastener Steel for Automotive Application: *Byung in Jung*[1]; [1]POSCO

3:00 PM
Stronger than Titanium, Lighter than Aluminum, Stops Blast/Bullets: Readily Weldable 1500-2000MPa Armor Technology for Lightweight Structure and Stampings: *Gary Cola*[1]; [1]Flash Steelworks

3:20 PM
Microstructure and Mechanical Properties of Intercritical Annealed 7 Mn Steels with Additional Warm-rolling: *Mei Zhang*[1]; [1]Shanghai University

3:40 PM Invited
3rd Generation AHSS by Thin Slab Technology: *Christian Klinkenberg*[1]; [1]SMS group

4:20 PM
Effect of Retained Austenite Control with Multi-step Heat treatment on the Microstructure Evolution and Mechanical Properties of Direct Quenched High Hardness Armor (HHA) Steel: *Min-Seok Baek*[1]; Young-Kyun Kim[1]; Tae-Won Park[2]; Jinhee Ham[2]; Kee-Ahn Lee[1]; [1]Inha University; [2]Agency for Defense Development (ADD)

4:40 PM
Creation of Wearproof Eutecticum Composition Materials for the Details of the High Temperature Dynamic Systems: *Volodymyr Tsyganov*[1]; Leonid Ivschenko[1]; Harold Byalik[1]; Richard Mokhnach[1]; Nataliia Sakhniuk[1]; [1]Zaporizhy National Technical University

Advanced Materials for Harsh Environments — Session III

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

Tuesday PM
October 1, 2019

Room: C126
Location: Oregon Convention Center

Session Chairs: Gurbinder Kaur; Gary Pickrell, Virginia Tech; Navin Manjooran, Solve Technology and Research, Inc.

2:00 PM Keynote
Role of Thermodynamics and Kinetics to Design for Passivation: *Michele Manuel*[1]; [1]University of Florida

2:40 PM
High-temperature Oxidation of Transient-liquid Phase Bonded Ni-based Alloys in 1 Bar and 200 Bar Carbon Dioxide: *Casey Carney*[1]; Richard Oleksak[1]; Gordon Holcomb[2]; Omer Dogan[2]; [1]Leidos Research Support Team; [2]National Energy Technology Laboratory

3:00 PM
Understanding Weathering Stability of Solar-reflective Composite Silicate Coatings: *Taisiya Skorina*[1]; Rebecca Everman[1]; Jean Tangeman[1]; Kent Budd[1]; Robert Brown[1]; Adam Brodd[1]; [1]3M

3:20 PM
Manufacturing Technology and Application of Cooling Stave in Blast Furnace: *Yong Deng*[1]; Qing Lv[1]; Jianliang Zhang[2]; Kexin Jiao[2]; [1]North China University of Science and Technology; [2]University of Science and Technology Beijing

3:40 PM
Inclusion Modification and Corrosion Resistance Optimization of 304 Stainless Steel Containing Cerium: *Xiaojun Xi*[1]; Maolin Ye[1]; Shufeng Yang[1]; Jingshe Li[1]; [1]University of Science and Technology Beijing

4:00 PM
Wear-corrosion Synergism Behavior of Molybdenum-Rhenium-Tellurium Alloys for Structural Application in Molten Salt Reactor: *Pankaj Kumar*[1]; Arpith Siddaiah[1]; Jun Du[2]; Pradeep Menezes[1]; Mano Misra[1]; [1]University of Nevada, Reno; [2]University of Utah

4:20 PM
Galvanic Corrosion Resistance of Mixed-material Joints Fabricated by Resistance Spot Riveting™: *Paul Krell*[1]; Jenifer Locke[1]; [1]Ohio State University

5:00 PM Concluding Comments

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; Riad Asfahani, U. S. Steel

Tuesday PM
October 1, 2019

Room: B111
Location: Oregon Convention Center

Session Chair: Yellapu Murty, MC Technologies

2:00 PM
Translational Atomistic Models for Design and Prediction of Corrosion Resistant Alloys for Extreme Environments: *Christopher Taylor*[1]; Huibin Ke[2]; Ramgopal Thodla[1]; [1]Dnv Gl; [2]Ohio State University

2:30 PM
Molecular Dynamics Simulation of Partially Hydrolyzed Polyacrylamide in Saline Solutions: *Qitong Liu*[1]; Wang Bu[1]; [1]University of Wisconsin Madison

2:50 PM
Effect of Cr and Mo on the Corrosion Behavior of High Strength Steel in CO2/H2S Environment: Keiichi Kondo[1]; *Yoon-Seok Choi*[2]; Srdjan Nesic[2]; Taro Ohe[1]; Jun Nakamura[1]; Hiroki Kamitani[1]; Hisashi Amaya[1]; [1]Nippon Steel Corporation; [2]Ohio University

3:10 PM
Effects of Nb and Mo Addition for Strengthening on Corrosion Resistance of 13%Cr Steels: *Shuji Hashizume*[1]; [1]TenarisNKKTubes

3:30 PM
Austenite Reversion during Tempering of Martensitic-ferritic Stainless Steel: *Tatiane Santos*[1]; Ricardo Carvalho[1]; Marília Lima[1]; Luciana Lima[1]; Adriana Rocha[1]; Vicente Buono[1]; [1]Vallourec Soluções Tubulares do Brasil

3:50 PM
Application of Biobased Corrosion Inhibitors for Oil and Gas Pipelines in Contaminated Environments: *Behzad Bavarian*[1]; Boris Miksic[1]; [1]California State University

4:10 PM
In-service Microstructure Evolution and Reliability Implications in High Gamma-prime Ni-based Superalloy Turbine Blades: *Patxi Fernandez-Zelaia*[1]; Michael Kirka[1]; Sebastien Dryepondt[1]; Yousub Lee[1]; Anand Kulkarni[2]; Kyle Stoodt[2]; Jason Weissman[2]; Santosh Narasimhachary[2]; [1]Oak Ridge National Laboratory; [2]Siemens Corporation Corporate Technology

Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder — Interface Stability in Advanced Interconnects

Program Organizers: Tae-Kyu Lee, Portland State University; Darrel Frear, Freescale Semiconductor; David Yan, San Jose State University; Albert T. Wu, National Central University

Tuesday PM
October 1, 2019

Room: A108
Location: Oregon Convention Center

Session Chairs: Tae-Kyu Lee, Portland State University; Darrel Frear, NXP

2:00 PM Invited
Interfacial Reactions in Co/Ag-Cu, Ni/Ag-Cu, Co/Ag-Sb and Ni/Ag-Sb Couples: *Sinn-wen Chen*[1]; [1]National Tsing Hua University

2:30 PM
Corrosion Behavior of Electroplated and Electroless Plating Ni/Pd/Au Surface Finish on Automobile Printed Circuit Board: *Albert T. Wu*[1]; Yi Ting Shen[1]; Chih Yuan Hsiao[2]; Freeze Wang[2]; Nico Li[2]; [1]National Central University; [2]Taiwan Uyemura Co Ltd

2:50 PM
Instability Detection in Press-fit Connector Pin Interconnects after Thermo-mechanical Cycling: *Yeonjin Baek*[1]; Li Li[2]; Tae-Kyu Lee[1]; [1]Portland State University; [2]Cisco Systems

3:10 PM
A Model Study of Microstructure Evolution and Bi Diffusion in Sn-Bi Low Temperature Soldering Systems: *Yaohui Fan*[1]; John Blendell[1]; Carol Handwerker[1]; [1]Purdue University

3:30 PM
Effect of Thermal Annealing on Structural Integrity of Cu-filled-through Si Via (TSV): *Dipali Sonawane*[1]; Praveen Kumar[1]; [1]IISc

Advances in Dielectric Materials and Electronic Devices — Ferroics and Multiferroics: Session I

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

Tuesday PM
October 1, 2019

Room: A105
Location: Oregon Convention Center

Session Chairs: Ruyan Guo, University of Texas at San Antonio; Ducinei Garcia, Federal University of Sao Carlos

2:00 PM Invited
Effects of Percolation and Ferroelectric-to-Relaxor-to-Dielectric Crossover in Lead-free Perovskite Solid Solutions: *Zuo-Guang Ye*[1]; Jian Zhuang[2]; Alexei Bokov[1]; Wei Ren[2]; [1]Simon Fraser University; [2]Xi'an Jiaotong University

2:20 PM Invited
Origin of Relaxor Behavior in Ba-based Perovskites by Raman Spectroscopy and First Principles Calculations: *Jürgen Spitaler*[1]; Maxim Popov[1]; Vignaswaran Veerapandiyan[1]; Giovanna Canu[2]; Eric Bousquet[3]; Pedro Groszewicz[4]; Markus Kratzer[5]; Christian Teichert[5]; Marek Pasciak[6]; Jiri Hlinka[6]; Vincenzo Buscaglia[2]; Marco Deluca[1]; [1]Materials Center Leoben Forschung GmbH; [2]CNR-ICMATE; [3]University of Liege; [4]Technical University of Darmstadt; [5]Institute of Physics, Montanuniversität Leoben; [6]Institute of Physics of the Czech Academy of Sciences

2:40 PM Invited
High-temperature Lead-free Multilayer Ceramic Capacitors with Ultrahigh Energy Density and Efficiency via Two-step Sintering: *Xiaohui Wang*[1]; Ziming Cai[1]; [1]Tsinghua University

3:00 PM Invited
Synchrotron X-ray Absorption Spectroscopy Investigation on Temperature- and Field-dependent Local Structure in BTO and PZT Perovskite Materials: Rojnapa Tharamas[1]; Phanupong Phaktapha[1]; Saroj Rujirawat[1]; *Rattikorn Yimnirun*[2]; [1]Suranaree University of Technology; [2]Vidyasirimedhi Institute of Science and Technology (VISTEC)

3:20 PM Invited
High Piezoelectricity in Relaxor-PT based Materials with Local Structural Heterogeneity: *Shujun Zhang*[1]; F. Li[2]; M.J. Cabral[3]; Elizabeth Dickey[3]; James LeBeau[3]; Long-Qing Chen[4]; T. Shrout[4]; [1]University of Wollongong; [2]Xi'an Jiaotong University; [3]North Carolina State University; [4]Pennsylvania State University

3:40 PM Invited
Structure-property Relationships in BaCexTi1-xO3 Ceramics and Comparison with Other BaMxTi1-xO3 Systems: *Giovanna Canu*[1]; Lavinia Curecheriu[2]; Maria Teresa Buscaglia[1]; Giorgia Confalonieri[3]; Marco Deluca[4]; Monica Dapiaggi[5]; Liliana Mitoseriu[2]; Vincenzo Buscaglia[1]; [1]CNR-ICMATE, Institute of Condensed Matter Chemistry and Technologies for Energy; [2]Department of Physics, Alexandru Ioan Cuza University; [3]Department of Chemical and Geological Sciences, University of Modena and Reggio Emilia; [4]Materials Center Leoben Forschung GmbH; [5]Department of Earth Sciences "Ardito Desio", University of Milan

4:00 PM Invited
Relaxor Dielectrics for Multilayer Capacitors with Temperature-stable Permittivity Up to 250°C: *Jörg Töpfer*[1]; Thomas Schulz[1]; Beate Capraro[2]; Heike Bartsch[3]; [1]University of Applied Sciences Jena; [2]Fraunhofer IKTS; [3]TU Ilmenau

4:20 PM
Effect of ZnO-doping on the Electric Properties of High Coercive Field PIN-PZN-PT Ceramics: *Michael Brova*[1]; Beecher Watson[1]; Rebecca Walton[1]; Elizabeth Kupp[1]; Mark Fanton[1]; Richard Meyer[1]; Gary Messing[1]; [1]Pennsylvania State University

4:40 PM
Piezoelectric Response of Magnetoelectric Particulate Composites to the Application of a DC Magnetic Field during Electric Poling: Flavio Milton[1]; Adélia Rodrigues[1]; Carlos de Castro Neto[1]; Leonardo Lemes[1]; Washington Santa Rosa[1]; Fábio Zabotto[1]; *Ducinei Garcia*[1]; [1]Federal University of Sao Carlos

ASM Edward DeMille Campbell Memorial Lecture

Tuesday PM
October 1, 2019

Room: Portland Ballroom 254
Location: Oregon Convention Center

12:45 PM Invited
Breaking Old Barriers: New Opportunities in Brittle Fracture: *Katherine Faber*[1]; [1]California Institute of Technology

Boron Based Materials and Coatings: Structure, Properties, Processing, and Applications — Boron Based Materials and Coatings: Structure, Properties, Processing, and Applications

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

Tuesday PM
October 1, 2019

Room: E141
Location: Oregon Convention Center

Session Chair: Roumiana Petrova, New Jersey Institute of Technology

2:00 PM Invited
Understanding the Driving Forces behind Lanthanum Hexaboride Lattice Formation: *Tracy Mattox*[1]; Jeffrey Urban[1]; [1]Lawrence Berkeley National Laboratory

2:40 PM
Design of Novel MoAlB based Compositions: *Maharshi Dey*[1]; Surojit Gupta[1]; [1]University of North Dakota

Ceramic and Crystal Materials for Optics and Photonics — Session III

Program Organizers: Yiquan Wu, Alfred University; Jas Sanghera, Naval Research Laboratory; Akio Ikesue, World-Lab. Co., Ltd; Mark Dubinskiy, Army Research Laboratory; Randall Hay, U.S. Air Force Research Laboratory; Xiang-Hua Zhang, Université de Rennes 1; Michael Squillante, RMD, Inc; Long Zhang, Chinese Academy of Sciences; Takunori Taira, National Institutes of Natural Science

Tuesday PM
October 1, 2019

Room: A107
Location: Oregon Convention Center

Session Chairs: Woohong (Rick) Kim, Naval Research Laboratory; Shyam Bayya, Naval Research Laboratory

2:00 PM Invited
Grain Size Dependent Properties Trends in Nanocrystalline Ceramics for Optical Applications: *James Wollmershauser*[1]; Boris Feigelson[1]; Kevin Anderson[2]; John Drazin[3]; Mason Wolak[1]; Heonjune Ryou[1]; Edward Gorzkowski[1]; [1]Naval Research Laboratory; [2]National Research Council Postdoctoral Research Fellow sited at U.S. Naval Research Laboratory; [3]Washington State University

2:40 PM Invited
Magneto-optic Ceramics for High-power Laser Applications: *Ryo Yasuhara*[1]; [1]National Institute for Fusion Science

3:00 PM
Manufacturing of CaLa2S4 Transparent Ceramics by Pressure-assisted Sintering Techniques: *Guillaume Durand*[1]; Christophe Coureau[2]; Philippe Adam[3]; Xiang-Hua Zhang[1]; Odile Merdrignac-Conanec[1]; [1]Université de Rennes 1 - UMR-CNRS 6226 ISCR; [2]Solcera Advanced Material; [3]DGA-MRIS

3:20 PM Invited
Non-uniform Yb-doped Ceramic Laser Gain Media: Shaping and Performance: *Jan Hostaša*[1]; Valentina Biasini[1]; Andreana Piancastelli[1]; Guido Toci[2]; Angela Pirri[3]; Laura Esposito[1]; [1]CNR ISTEC, Institute of Science and Technology for Ceramics; [2]CNR INO, National Institute of Optics; [3]CNR IFAC, Institute of Applied Physics "Nello Carrara"

3:40 PM Invited
Sintering of Nanocrystalline Transparent Zinc Aluminate: Chenguang Yang[1]; Andrew Thron[1]; *Ricardo Castro*[1]; [1]University of California, Davis

4:00 PM
Recent Development in Spinel Processing: *Shyam Bayya*[1]; Guillermo Villalobos[1]; Woohong Kim[1]; Michael Hunt[1]; Syed Qadri[1]; Lynda Busse[1]; Jesse Frantz[1]; Brandon Shaw[1]; Ishwar Aggarwal[2]; Chris Wilson[2]; Fritz Miklos[3]; Bryan Sadowski[3]; Jas Sanghera[1]; [1]Naval Research Laboratory; [2]University of North Carolina at Charlotte; [3]KeyW Corporation

Ceramics and Glasses Simulations and Machine Learning — First Principle Simulations of Ceramics and Glasses

Program Organizers: Mathieu Bauchy, University of California, Los Angeles; Peter Kroll, University of Texas; Efrain Hernandez, Army Research Laboratory

Tuesday PM
October 1, 2019

Room: A109
Location: Oregon Convention Center

Session Chairs: Mathieu Bauchy, University of California, Los Angeles; N. M. Anoop Krishnan, IIT Delhi

2:00 PM
Genesis of "Free" Carbon in Silicon Oxycarbide Ceramics: *Peter Kroll*[1]; [1]University of Texas at Arlington

2:20 PM
Predicting Nuclear Magnetic Resonance Parameters in Ceramics Using Density Functional Theory: *Ryan McCarty*[1]; Arthur Pyuskulyan[1]; Jingda Zhang[2]; Kieron Burke[1]; [1]University of California, Irvine; [2]Nankai University

2:40 PM
The Stability, Structure and Properties of the Zeta Phase in the Transition Metal Carbides: *Christopher Weinberger*[1]; Hang Yu[2]; Xiao-Xiang Yu[3]; Gregory Thompson[4]; [1]Colorado State University; [2]Drexel University; [3]Northwestern University; [4]University of Alabama

3:00 PM
Thermal Conductivity of a Glass Material by First-principles Molecular Dynamics: The Case of $GeTe_4$: *Evelyne Martin*[1]; Carlo Massobrio[2]; [1]IEMN; [2]IPCMS

3:20 PM
Role of Multi-state Hydrogen during Mayenite Electride Formation by First-principles Calculation: *Zheng Yu*[1]; Bu Wang[1]; [1]University of Wisconsin, Madison

3:40 PM
The Thermophysical Properties of TcO2: *Hong Zhong*[1]; Jason Lonergan[2]; John McCloy[1]; Scott Beckman[1]; [1]Washington State University; [2]Pacific Northwest National Laboratory

4:00 PM
Tuning Electronic Properties in II-IV-V2 Semiconductors via Sub-lattice Configurational Disorder: *Jacob Cordell*[1]; Jie Pan[2]; Stephan Lany[2]; Garritt Tucker[1]; [1]Colorado School of Mines; [2]National Renewable Energy Laboratory

Characterization of Materials and Properties through Metallography, Mechanical Testing and Analysis - From Fundamentals to the Cutting Edge — Quantification, Classification and Simulation of Microstructures and Properties I

Program Organizer: Michael Keeble, Buehler

Tuesday PM
October 1, 2019

Room: F152
Location: Oregon Convention Center

Session Chairs: Daniel Dennies, DMS, Inc; Gabriel Lucas, Scot Forge Company; Jaret Frafjord, IMR Test Labs

2:00 PM Invited
ASM-IMS Henry Clifton Sorby Lecture: Development and Characterization of High-performance Materials by Means of Cross-scale Metallography and Complementary Methods: *Helmut Clemens*[1]; [1]Montanuniversitaet Leoben

3:00 PM Question and Answer Period

3:20 PM Invited
Fascinating New Surfaces by Advanced Laser Structuring? – Metallography and Mechanical Testing of Periodic Micro-patterned Surfaces for Reduced Friction and Contact Resistance: *Frank Muecklich*[1]; Leander Reinert[2]; Andres Lasagni[3]; [1]University of Saarland; [2]Material Engineering Center Saarland; [3]TU Dresden

3:40 PM
Phase Identification and Mechanical Properties of a Ti-20Fe-20Co Alloy: *Song Cai*[1]; [1]Fort Wayne Metals

4:00 PM Invited
Characterizing Inclusion Populations in Superelastic Nitinol and Correlation to Mechanical Behavior: *Janet Gbur*[1]; John Lewandowski[1]; [1]Case Western Reserve University

4:20 PM Invited
Microstructure of Iron-based Historical Specimens: *George Vander Voort*[1]; [1]Vander Voort Consulting L.L.C.

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

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

Tuesday PM
October 1, 2019

Room: D134
Location: Oregon Convention Center

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

2:00 PM Keynote
Crafting Uniform Hairy Nanocrystals for Energy Conversion and Storage: *Lin Zhiqun*[1]; [1]Georgia Institute of Technology

2:40 PM Invited
The Core-shell Engineering on Energy Product of Magnetic Nanometals: *Shenqiang Ren*[1]; [1]University at Buffalo, The State University of New York

3:10 PM
Epitaxial Growth of Soft Perovskites and the Hidden Carrier Dynamics: *Jie Jiang*[1]; Yiping Wang[1]; Jing Feng[2]; Jian Shi[1]; [1]Rensselaer Polytechnic Institute; [2]Kunming University of Science and Technology

3:30 PM Invited
Synthesis, Processing and Additive Manufacturing of Architected Materials with Designed Structural and Multi-functional Responses: *Xiaoyu Zheng*[1]; [1]Virginia Polytechnic Institute and State University

4:00 PM
Self Supported Cu Doped TiO_2 Nano-fibrous Blankets for Visible Light Photo Catalysis: *Fateh Mikaeili*[1]; Perena Gouma[1]; [1]Ohio State University

4:20 PM
Controlled Synthesis of Lamellar-like Electrospun Ceramic Nanofibers for Energy Application: *Oren Elishav*[1]; Gennady Shter[1]; Gideon Grader[1]; [1]Technion

4:40 PM
Nickel-SiOC Magnetoceramics from Water Assisted Pyrolysis of Polymers: *Kathy Lu*[1]; Ni Yang[1]; [1]Virginia Polytechnic Institute

Data Science for Material Property Interpretation — Machine Learning Applications to Materials Data

Program Organizers: Alex Belianinov, Oak Ridge National Laboratory; Ichiro Takeuchi, University of Maryland; Jeff Simmons, Wright Patterson Air Force Research Laboratory; Jason Hattrick-Simpers, National Institute of Standards and Technology

Tuesday PM
October 1, 2019

Room: E145
Location: Oregon Convention Center

Session Chair: Alex Belianinov, Oak Ridge National Laboratory

2:00 PM Invited
Structure Prediction and Property-based Optimization of Molecular Crystals with GAtor: *Noa Marom*[1]; [1]Carnegie Mellon University

2:40 PM
Deciphering the Atomic Origin of Glasses' Properties by Machine Learning: Tyanyi Bao[1]; *Mathieu Bauchy*[1]; [1]University of California, Los Angeles

3:00 PM
Application of Artificial Neural Networks to Low Cycle Fatigue and Creep Data Processing for Power Plant Materials: *Kuk-Cheol Kim*[1]; Jhin-Ik Suk[1]; Byeong-Ook Kong[1]; [1]Doosan Heavy Industries & Construction

3:20 PM Break

3:35 PM Invited
3D Nanoprinting: An Integrated Approach of Experiments, Computer-aided Design and Simulations: *Jason Fowlkes*[1]; Robert Winkler[2]; Eva Mutunga[3]; Juergen Sattelkow[2]; Philip Rack[3]; Harald Plank[2]; [1]Oak Ridge National Laboratory; [2]Graz University of Technology; [3]The University of Tennessee

4:15 PM
Python For Glass Genomics (PyGGi): A Machine Learning Package to Predict the Properties of Glasses: Hargun Singh[1]; R. Ravinder[1]; Pratik Bhaskar[1]; Hariprasad Kodamana[1]; *N. M. Anoop Krishnan*[1]; [1]Indian Institute of Technology Delhi

4:35 PM
A Machine Learning Approach to Independent Component Analysis for Nuclear Magnetic Resonance Spectra: *Ryan McCarty*[1]; Jason Kahn[1]; David Rotter[1]; Ryan Padilla[1]; Nadia Ahmed[1]; Domingos Begalli[1]; [1]University of California, Irvine

4:55 PM Invited
Adversarial Networks for Digital Microstructure Generation: *Stephen Niezgoda*[1]; Mengfei Yuan[1]; Dennis Dimiduk[1]; Yunzhi Wang[1]; [1]Ohio State University

Failure Analysis & Characterization — Environmentally Assisted Failures

Program Organizers: Andrew Havics, PH2 LLC; James Lane, Rimkus Consulting Group Inc; Burak Akyuz, Applied Technical Services Inc; Pierre Dupont, UMONS, Faculté Polytechnique de MONS (FPMs)

Tuesday PM
October 1, 2019

Room: F150
Location: Oregon Convention Center

Session Chairs: Thomas Ackerson, Curtiss Wright - IMR Test Labs; Ellen Wright, Engineering Systems Inc.; John Macha, Southwest Research Institute

2:00 PM
When Cleaning Makes a Mess: Case Studies Involving Cleaning Agents: *Ellen Wright*[1]; Mark Hineman[1]; Keith Cline[1]; Dale Alexander[1]; Brian May[1]; [1]Engineering Systems Inc. (ESi)

2:20 PM
Failure Analysis of a Corrosion Resistant Hot Water Heater: *Noah Budiansky*[1]; Vir Narinkari[1]; Ockert Van Der Schijff[1]; [1]Exponent

2:40 PM
Comparison of Environmental Cracking in Metals and Polymers: *Mark Hineman*[1]; Ron Parrington[1]; Dale Edwards[1]; [1]Engineering Systems Inc.

3:00 PM
Hydrogen-related Plastic Deformation and Fracture Behaviors in 2Mn-0.1C Steel with Ferrite Microstructure: *Kazuho Okada*[1]; Akinobu Shibata[1]; Wu Gong[2]; Nobuhiro Tsuji[1]; [1]Department of Materials Science and Engineering, Kyoto University; [2]Elements Strategy Initiative for Structural Materials (ESISM), Kyoto University

3:20 PM
Microbiological Induced Corrosion of Welds in Stainless Steel Piping: *Waleed Khalifa*[1]; [1]Cairo University

3:40 PM
Corrosion Inhibition and Passivation Characteristics of Neem Leaf Oil Extracts on Mild Steel in Citric Acid Media: *Roland Loto*[1]; Cleophas Loto[1]; Ayobami Busari[1]; [1]Covenant University

4:00 PM
Effect of White Aluminum Dross on the Corrosion Resistance of Reinforcement Carbon Steel in Simulated Concrete Pore Solution: *Roland Loto*[1]; Ayobami Busari[1]; [1]Covenant University

4:20 PM
Corrosion Inhibition Performance of Cedrus Atlantica on Low Carbon Steel in Dilute Acid Concentrations: *Roland Loto*[1]; Cleophas Loto[1]; [1]Covenant University

Failure Analysis: Industry Specific Failures — Boilers, Pressure Vessels, Welding & Joining Failures

Program Organizers: Andrew Havics, PH2 LLC; James Lane, Rimkus Consulting Group Inc; Burak Akyuz, Applied Technical Services Inc; Pierre Dupont, UMONS, Faculté Polytechnique de MONS (FPMs)

Tuesday PM
October 1, 2019

Room: F151
Location: Oregon Convention Center

Session Chairs: Aaron Tanzer, Element; Brett Miller, IMR Metallurgical Services; Thomas Traubert, EDT Engineering; Kyle Minden, Engineering Design & Testing Corporation; Courtney Pape, DNV GL; Thomas Kozina, Bearings; Erik Pfeif, Colorado School of Mines

2:00 PM Invited
Oil Heater Tube Failure due to Excessive Unintended Carburization: *David Williams*[1]; [1]Engineering Design & Testing Corp.

2:20 PM
Failure Analysis of a Corroded SCUBA Tank: *Dana Medlin*[1]; Jacob Fuerst[2]; [1]EAG Laboratories; [2]Remington Outdoor Company

2:40 PM
Inadequate Weld Repair and Rupture of a Pressure Vessel: *Kyle Minden*[1]; [1]EDT

3:00 PM
Failure Analysis of a Waste Heat Recovery Boiler Thermally Coupled to Ammonia Oxidation Reactor: *Muhammad Butt*[1]; Muhammad Manzoor[1]; Tahir Ahmad[1]; Muhammad Kamran[1]; [1]University of the Punjab

3:20 PM
Tube Leaks in Black Liquor Recovery Boiler: *Thomas Traubert*[1]; [1]EDT Engineers

3:40 PM
Avoidable and Non-avoidable Failures in Power Plants: Fahmida Hossain[1]; *Veda-Anne Ulcickas*[1]; [1]Massachusetts Materials Research, Inc.

4:00 PM
A Tale of Two Studies: Remaining Useful Life in Seam-welded P-11 High Energy Steam Piping after 39 Years of Service: *Rachel Wittman*[1]; John Hasier[1]; [1]Intertek

4:20 PM Invited
The Perfect Storm Effects on Catastrophic Events: *Robert O'Shea*[1]; Kent Johnson[1]; [1]Applied Materials Technolgies Inc.

Formability and Fracture of Metal Sheets — Formability and Fracture of Metal Sheets I

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

Tuesday PM
October 1, 2019
Room: C123
Location: Oregon Convention Center

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

2:00 PM Invited
Biaxial Tensile Testing Using Laser-deposited Cruciform and Its Extension to Non-proportional Loading: Yong Hou[1]; Junying Min[1]; Nan Guo[1]; Jianping Lin[1]; *John Carsley*[2]; Thomas Stoughton[2]; Changwei Lian[1]; [1]Tongji University; [2]General Motors Company

2:30 PM Invited
Stress-strain Response in the Early Stage of Hydraulic Bulge Testing: Lulu Deng[1]; Junying Min[1]; *John Carsley*[2]; Thomas Stoughton[2]; Jianping Lin[1]; [1]Tongji University; [2]General Motors Company

3:00 PM
Behavior of Quenched-and-partitioned Steels Deformed at Elevated Temperatures: *Ana Araujo*[1]; Jun Hu[1]; Erik Pavlina[1]; Amrinder Gill[1]; [1]AK Steel Research and Innovation Center

3:20 PM
Edge Stretchability of Hot Rolled High-strength Low-alloy Steel: David Overby[1]; Chad Cathcart[1]; *Xingcai Yu*[1]; Tihe Zhou[1]; Peter Badgley[1]; Chris Martin-Root[1]; [1]Stelco Inc.

3:40 PM
Effect of Ultrasonic-assisted Two-point Incremental Sheet Forming (UA-TPIF) on Surface Finish: *Randy Cheng*[1]; Ankush Bansal[1]; Xun Liu[2]; Alan Taub[1]; [1]University of Michigan; [2]The Ohio State University

4:00 PM
The Influence of Phase Constituents on Hole Expansion Capacity of Multi-phase Steels: *Wei Li*[1]; Martina Vittorietti[2]; Geurt Jongbloed[2]; Jilt Sietsma[1]; [1]Department of Materials Science and Engineering, Delft University of Technology; [2]Delft Institute of Applied Mathematics, Delft University of Technology

4:20 PM
A Method to Predict the Ductile Fracture of Metal Sheets under Complex Plane Stress: *Jian Fang*[1]; Jian-wei Zhang[1]; [1]Baoshan Iron & Steel Co. Ltd.

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

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

Tuesday PM
October 1, 2019
Room: A106
Location: Oregon Convention Center

Session Chairs: Steve Martin, Iowa State University; Kathleen Richardson, University of Central Florida

2:00 PM Invited
Cooper Distinguished Lecture: Function-tailoring Strategies for Broadband Infrared Glasses: *Kathleen Richardson*[1]; [1]University of Central Florida

2:40 PM Invited
2019 Alfred R. Cooper Young Scholar Award Presentation: Topological Constraint Model of High Lithium Content Borate Glasses: *Wataru Takeda*[1]; [1]Coe College

3:20 PM Invited
Thin-film Glassy Solid Electrolytes: A New Functionality for Glass Enabling High Energy Density Li and Na Batteries: *Steve Martin*[1]; Steven Kmiec[1]; Guantai Hu[1]; Ran Zhao[1]; Ryan Gebhardt[1]; Adriana Joyce[1]; Dmitriy Bayko[1]; Onel Valdez[1]; Jacob Lovi[1]; [1]Iowa State University

3:50 PM Invited
Glass Contributions to Advances in Nuclear Energy: *Charmayne Lonergan*[1]; Jarrod Crum[1]; Josef Matyas[1]; John Vienna[1]; [1]Pacific Northwest National Laboratory

4:20 PM Invited
Electrical Conduction in Metal-doped Chalcogenide Glasses: Kirtankumar Dixit[1]; David Drabold[1]; *Gang Chen*[1]; [1]Ohio University

Grain Boundaries, Interfaces, and Surfaces in Functional Materials: Fundamental Structure-Property-Performance Relationships — Interfaces in Energy Storage and Conversion Materials

Program Organizers: Ming Tang, Rice University; Shen Dillon, University of Illinois, Urbana-Champaign; John Blendell, Purdue University; Wayne Kaplan, Technion - Israel Institute of Technology

Tuesday PM
October 1, 2019
Room: E143
Location: Oregon Convention Center

Session Chairs: Linsen Li, Shanghai Jiao Tong University; Yue Qi, Michigan State University

2:00 PM Invited
First-principles Prediction of Potentials and Space-charge Layers in All-solid-State Batteries: Michael Swift[1]; *Yue Qi*[1]; [1]Michigan State University

2:30 PM Invited
Anisotropy in Ceramic Interfaces: Rare-earth Pyrosilicates for High-temperature Coatings and Halide Perovskites for Solar Cells: *Hadas Sternlicht*[1]; Nitin Padture[1]; [1]Brown University

3:00 PM
A Thermal Grooving Study of Ni-diffusion and Grain-boundary Energies in SOFC-anodes: *Patricia Haremski*[1]; Matthias Wieler[2]; Anika Marusczyk[2]; Michael J. Hoffmann[3]; Paul Hoffrogge[4]; Daniel Schneider[5]; Britta Nestler[5]; Piero Lupetin[2]; [1]Robert Bosch GmbH; Karlsruhe Institute of Technology; [2]Robert Bosch GmbH; [3]Karlsruhe Institute for Technology; [4]Karlsruhe University of Applied Sciences; [5]Karlsruhe University of Applied Sciences; Karlsruhe Institute of Technology

3:20 PM
Insights into the CO2 Stability-performance Trade-off of Antimony-doped SrFeO3-d Perovskite Cathode for Solid Oxide Fuel Cells: *Yuqing Meng*[1]; Jun Gao[1]; Kyle Brinkman[1]; [1]Clemson University

3:40 PM Invited
Electrochemical-shock Resistant Single-crystal Ni-rich Layered Cathode Materials: *Linsen Li*[1]; Guannan Qian[1]; Zi-Feng Ma[1]; [1]Shanghai Jiao Tong University

4:10 PM
Stress-induced Interface Instability in Battery Electrode Compounds: Youtian Zhang[1]; *Ming Tang*[1]; [1]Rice University

4:30 PM
Design of Highly Stable Nanostructured LiMn2O4 for Li-ion Battery Cathodes: *Kimiko Nakajima*[1]; Ricardo Castro[1]; [1]University of California, Davis

Hybrid Organic-Inorganic Materials for Alternative Energy — Photovoltaics

Program Organizers: Andrei Jitianu, Lehman College, City University of New York; Lisa Klein, Rutgers University; Lia Stanciu, Purdue University; Mihaela Jitianu, William Paterson University

Tuesday PM
October 1, 2019

Room: E147
Location: Oregon Convention Center

Session Chair: Andrei Jitianu, Lehman College - City University of New York

2:00 PM Invited
Impacts of Nanostructures and Interfaces on Perovskite Solar Cell Performance: *Guozhong Cao*[1]; [1]University of Washington

2:30 PM Invited
In Situ Transient Absorption Spectroscopy of Organometal Halide Perovskite Nanoparticles: James Sadighian[1]; Michael Crawford[1]; *Cathy Wong*[1]; [1]University of Oregon

3:00 PM
Composition-dependent Properties of Point Defects in Halide Perovskite: An ab Initio Study: *Rabi Khanal*[1]; Anirban Naskar[1]; M. F. N. Taufique[2]; Nicholas Ayers[1]; Soumik Banerjee[2]; Samrat Choudhury[1]; [1]University of Idaho; [2]Washington State University

3:20 PM Invited
Probing Electronic Stability in Hybrid Halide Perovskites: *John Labram*[1]; [1]Oregon State University

3:50 PM Invited
Self-assembled Amphiphilic Block Copolymers/CdTe Nanocrystals for Efficient Aqueous-processed Hybrid Solar Cells: *Christine Luscombe*[1]; [1]University of Washington

Hydrogen Effects on Materials Performance — Advanced Computational and Experimental Methods for Probing Hydrogen-Materials Interactions

Program Organizers: Samantha Lawrence, Los Alamos National Laboratory; Kip Findley, Colorado School of Mines; Megan Cordill, Erich Schmid Institute for Materials Science

Tuesday PM
October 1, 2019

Room: E146
Location: Oregon Convention Center

Session Chairs: Neville Moody, Sandia National Laboratories; Vsevolod Razumovskiy, Materials Center Leoben Forschung GmbH

2:00 PM
Molecular Dynamics Analysis on the Effect of Hydrogen in Grain Boundary Deformation of Lath Martensitic Steel: *Kazuki Matsubara*[1]; Akihide Nagao[1]; Nobuyuki Ishikawa[1]; [1]JFE Steel Corporation

2:20 PM Invited
Modeling Hydrogen-induced Fracture of Lath Martensitic Steels: *Mohsen Dadfarnia*[1]; Akihide Nagao[2]; Brian Somerday[3]; Petros Sofronis[4]; Robert Ritchie[5]; [1]Seattle University; [2]JFE Steel Corporation; [3]Southwest Research Institute; [4]University of Illinois at Urbana-Champaign; [5]University of California, Berkeley

2:50 PM
Technology Maturity for Molecular Dynamics Studies of Hydrogen Embrittlement in Fe-C Based Steels: *Xiaowang Zhou*[1]; Michael E. Foster[1]; Joseph Allen Ronevich[1]; Christopher W San Marchi[1]; [1]Sandia National Laboratories

3:10 PM Invited
Probing Three Proposed Mechanisms of Hydrogen Embrittlement: Combined HEXRD and SAXS Measurements of Strain, Dislocation Density, and Porosity Near Steel Fatigue Cracks Grown in Hydrogen: *Matthew Connolly*[1]; May Martin[1]; Peter Bradley[1]; Damian Lauria[1]; Andrew Slifka[1]; Robert Amaro[2]; [1]National Institute of Standards and Technology; [2]Southern Research

3:40 PM
In situ Studies of High Pressure Hydrogen Effects on Polymeric Materials Performance: *Wenbin Kuang*[1]; Kevin Simmons[1]; Wendy Bennett[1]; Timothy Rooseedaal[1]; Stanley Owsley[1]; Stan Pitman[1]; Dustin Celland[1]; Angel Ortiz[1]; Brian Weed[1]; Gayaneh Petrossian[1]; [1]Pacific Northwest National Laboratory

4:00 PM
Hydrogen Doping Effect on the Photocatalytic Performance of Titanium Dioxide: *Evan Hyde*[1]; Matthew Beck[1]; [1]University of Kentucky

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

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

Tuesday PM
October 1, 2019

Room: G132
Location: Oregon Convention Center

Session Chairs: Sid Pathak, University of Nevada, Reno; Ondrej Muránsky, University of New South Wales

2:00 PM Invited
Improving Ductility of Magnesium through Reversible Phase Transformation in bcc Mg/Nb Nanolaminates: *Youxing Chen*[1]; Nan Li[2]; Satyesh Yadav[3]; Xiangyang Liu[2]; Jian Wang[4]; Nathan Mara[5]; [1]University of North Carolina, Charlotte; [2]Los Alamos National Laboratory; [3]Indian Institute of Technology Madras; [4]University of Nebraska, Lincoln; [5]University of Minnesota, Twin Cities

2:30 PM Invited
Enhancing Ductility of Metal-metal and Metal-ceramic Multilayered Nanocomposites: *Siddhartha Pathak*[1]; [1]University of Nevada, Reno

3:00 PM
Characterizing Glissile Dislocation Junctions Using Electron Microscopy: *Fulin Wang*[1]; Daniel Weygand[2]; Daniel Gianola[1]; [1]University of California, Santa Barbara; [2]Karlsruhe Institute of Technology

3:20 PM Invited
Dynamical Deformation Mechanism Study on a Zirconium Alloy by In-situ TEM Deformation Coupled with 3D Dislocation Tomography: *Fei Long*[1]; Josh Kacher[2]; Zhongwen Yao[1]; Mark Daymond[1]; [1]Queen's University; [2]Georgia Institute of Technology

3:50 PM Invited
On the Measurement of Dislocations and Dislocation Structures using EBSD and HRSD Techniques: *Ondrej Muransky*[1]; [1]ANSTO

Joining of Advanced and Specialty Materials XXI — Welding in the Automotive Industry / Joining, Brazing and Adhesive of Advanced Materials

Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee; Hiroaki Mori, Osaka University; Yuri Hovanski, Brigham Young University; Darren Barborak, WeldQC Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell; Zhenzhen Yu, Colorado School of Mines

Tuesday PM
October 1, 2019

Room: Portland Ballroom 252
Location: Oregon Convention Center

Session Chair: Michael Halbig, NASA Glenn Research Center

2:00 PM
A Challenge in Multi-material Structures with Automotive Metal Fasteners: *Hyun-Ju Choi*[1]; Won-Kyung Kang[1]; [1]Korea Automotive Technology Institute

2:20 PM
Study of Solid-state Reactions in Diffusion Bonded Inconel 600 to SiC with Metallic Interlayers: *Yaiza Rodriguez*[1]; Timothy Phero[1]; Allyssa Bateman[1]; Kyu Han[1]; Jim Steppan[1]; Balky Nair[1]; Brian Jaques[1]; [1]Boise State University

2:40 PM
Air Braze Tape for High Temperature Electrochemical Devices: *Jens Darsell*[1]; John Hardy[1]; Tim Lin[2]; Quan Yang[2]; Chuck Tan[2]; [1]Pacific Northwest National Laboratory; [2]Aegis Technology, Inc.

3:00 PM
Investigation of Corrosion Resistance of Nickel-based Brazing Filler Metal for Stainless Steel for Heat Exchanger: *Yusuke Fukai*[1]; Ikuo Shohji[1]; Tetsuya Ando[2]; Takuya Yoshida[3]; Tuyoshi Kashiwase[3]; Noboru Otomo[3]; [1]Gunma University; [2]Muroran Institute of Technology; [3]Atago Mfg, Co., Ltd

3:20 PM
Interfacial Reaction and Strengthening Mechanism of YIG/MTC Joint Brazed by Bismuth-based Glass: *Qianqian Chen*[1]; Peng He[1]; Tiesong Lin[1]; Panpan Lin[1]; Dusan Sekulic[1]; [1]Harbin Institute of Technology

3:40 PM
Investigation of Mechanical Properties of Sn-5Sb and Sn-6.4Sb-3.9Ag High-temperature Lead-free Solder: *Kohei Mitsui*[1]; Ikuo Shohji[1]; [1]Gunma University

4:00 PM
Joining of Additively Manufactured Titanium with Different Surface Structures and Fiber-reinforced Polyetherketone (PEK) for Lightweight Design Applications: *Juliane Moritz*[1]; Philipp Goetze[2]; Tom Schiefer[1]; Annett Klotzbach[1]; Elena López[1]; Jens Standfuss[1]; Frank Brueckner[3]; Christoph Leyens[4]; [1]Fraunhofer Institute for Material and Beam Technology IWS; [2]Technische Universitaet Dresden; [3]Fraunhofer Institute for Material and Beam Technology IWS, Lulea University of Technology; [4]Fraunhofer Institute for Material and Beam Technology IWS, Technische Universitaet Dresden

4:20 PM
Effect of Aging under High-temperature and High-humidity Environment on Adhesion Strength and Change in Chemical Structure of Structural Adhesive: *Hitomi Abiko*[1]; Ikuo Shohji[1]; Seigo Shimizu[2]; Yugo Tomita[2]; [1]Gunma University; [2]Subaru Co., Ltd

Light Metal Technology — Aluminum Technology

Program Organizers: Xiaoming Wang, Purdue University; Alan Luo, Ohio State University; Kumar Sadayappan, Canmet MATERIALS

Tuesday PM
October 1, 2019

Room: D138
Location: Oregon Convention Center

Session Chair: Xiaoming Wang, Purdue University

2:00 PM
Alloy Development and Process Innovations for Lightweight Alloys: *Alan Luo*[1]; [1]Ohio State University

2:20 PM
Screening Micro-alloying Additions to Accelerate Al_3Zr Precipitation in Aluminum-zirconium Alloys, using ICME: *Philip Staublin*[1]; Paul Sanders[1]; [1]Michigan Technological University

2:40 PM
Influence of Iron and Nickel Additions on the Conductivity, Microhardness and Microstructure of Pure Aluminum: *Stephanie Kotiadis*[1]; Abdallah Elsayed[1]; Eli Vandersluis[2]; Comondore Ravindran[2]; [1]University of Guelph; [2]Ryerson University

3:00 PM
Development of High Ductility Al-Zn-Mg Casting Alloys for Automotive Structural Components: *Anthony Lombardi*[1]; Glenn Byczynski[1]; Chufan Wu[2]; Xiaochun Zeng[2]; Sumanth Shankar[2]; Gabriel Birsan[3]; Kumar Sadayappan[3]; [1]Nemak USA/CAN; [2]McMaster University; [3]Canmet Materials, Natural Resources Canada

3:20 PM
Aluminum Matrix Composites: The Formation and Effects of In-situ Reinforcing Particles: Siming Ma[1]; Corey Vian[1]; Aoke Jiang[1]; *Xiaoming Wang*[1]; [1]Purdue University

3:40 PM
Contribution to the Study of Portevin-Le Chatelier Effect in Aluminum Alloy 2024: *Fabienne Delaunois*[1]; Edwin Denil[2]; Yves Marchal[3]; Véronique Vitry[1]; [1]UMONS - FPMs; [2]ArcelorMittal Liège; [3]SONACA

4:00 PM Invited
The Effect of Reduced Graphene Oxide on Spark Plasma Sintered Aluminum Powder: Kristian Mackowiak[1]; *Kyle Lessoway*[1]; Colin van der Kuur[2]; Lukas Bichler[1]; [1]University of British Columbia - Okanagan Campus; [2]Zenyatta Ventures Ltd.

4:20 PM
Compositional Design, Microstructure and Mechanical Properties of Al-Mg-X Alloys with Ultra-high Content of Mg: *Yaojun Lin*[1]; Zhibo Liu[1]; Zhigang Yan[2]; [1]Wuhan University of Technology; [2]Yanshan University

Materials for Nuclear Applications — Fundamentals of Radiation Effects

Program Organizers: Philip Edmondson, Oak Ridge National Laboratory; Yutai Katoh, Oak Ridge National Laboratory; Jake Amoroso, Savannah River National Laboratory; Levi Gardner, University of Utah; Amy Gandy, University of Sheffield; Karl Whittle, University of Liverpool; Monica Ferraris, Politecnico di Torino

Tuesday PM
October 1, 2019

Room: E148
Location: Oregon Convention Center

Session Chairs: Izabela Szlufarska, University of Wisconsin-Madison; Rachel Seibert, Oak Ridge National Laboratory

2:00 PM Invited
Combined Use of In-situ and Ex-situ TEM to Characterize Irradiation Induced Dislocation Loops in F/M Steels for Nuclear Applications: *Djamel Kaoumi*[1]; [1]North Carolina State University

2:40 PM
In-situ Ion Irradiation Study of Silicon Carbide-carbon Coated Nanostructured Ferritic Alloy: *Kathy Lu*[1]; Kaustubh Bawane[1]; [1]Virginia Polytechnic Institute

3:00 PM
Comparison of In-situ Micro- and Ex-situ Meso-scale Tensile Testing for the Evaluation of Mechanical Properties of Stainless Steels: *Tanvi Ajantiwalay*[1]; Hi Vo[2]; Peter Hosemann[2]; Assel Aitkaliyeva[1]; [1]University of Florida; [2]University of California Berkeley

3:40 PM
Multi-dimensional, In-situ Mechanical Testing to Evaluate Damage and Fracture of Chromium-coated Zirconium-based Fuel Claddings: *David Roache*[1]; Alex Jarama[1]; Clifton Bumgardner[1]; Frederick Heim[1]; Xiaodong Li[1]; [1]University of Virginia

4:00 PM
Predicting Concrete's Response to Irradiation: *Mathieu Bauchy*[1]; Anoop Krishnan[2]; [1]University of California, Los Angeles; [2]IIT Delhi

4:20 PM
Techniques for In-situ Monitoring of Materials Degradation in VTR Cartridge Loop Environments: *Camila Toledo*[1]; Lucas Teeter[1]; Andrew Brittan[1]; Guillaume Mignot[1]; Julie Tucker[1]; George Young[2]; Samuel Briggs[1]; [1]Oregon State University; [2]Kairos Power

4:40 PM
Transmutation-induced Precipitation in Tungsten Irradiated with a Mixed Energy Neutron Spectrum: *Xunxiang Hu*[1]; Chad Parish[1]; Kun Wang[2]; Takaaki Koyanagi[1]; Benjamin Eftink[3]; Yutai Katoh[1]; [1]Oak Ridge National Laboratory; [2]Alfred University; [3]Los Alamos National Laboratory

Metal and Polymer Matrix Composites IV — Metal Matrix Composites

Program Organizers: Nikhil Gupta, New York University; Tomoko Sano, U.S. Army Research Laboratory

Tuesday PM
October 1, 2019

Room: D136
Location: Oregon Convention Center

Session Chairs: Tomoko Sano, US Army Research Laboratory; William Harrigan, Gamma Alloys

2:00 PM Invited
Micropillar Compression in As-solidified and Ultrafine-grained Inhomogeneous Al-TiC Nanocomposites: A Comparative Study: *Zuqi Hu*[1]; Chezheng Cao[1]; Marta Pozuelo[1]; Suveen Mathaudhu[2]; Christian Roach[2]; Xiaochun Li[1]; Jenn-Ming Yang[1]; [1]University of California, Los Angeles; [2]University of California, Riverside

2:20 PM
Exploiting Metal-carbon Interfaces in Covetic Hybrid Materials for Superior Multifunctional Performance: *Christopher Shumeyko*[1]; Daniel Cole[1]; Xiaoxiao Ge[2]; Christopher Klingshirn[2]; Lourdes Salamanca-Riba[2]; [1]U.S. Army Research Laboratory; [2]University of Maryland

2:40 PM
Production of Tricycle Brake Pad/Lining with Iron Dross Waste: Wasiu Ajibola Ayoola[1]; Muideen Bodude[1]; *Chuwuemeka Onoh*[1]; Kafayat Ayoola[1]; [1]University of Lagos

3:00 PM
Wear Behavior of Hybrid Cu/TiC-Gr Infiltrated Composites: *Carlos Leon-Patino*[1]; Alejandro Miranda-López[1]; Ena Aguilar-Reyes[1]; Gabriel Rodríguez-Ortiz[2]; [1]Universidad Michoacana De San Nicolas De Hidalgo; [2]Universidad Politécnica de Juventino Rosas

Modeling Variability of Mechanical Behavior through ICME Techniques with Emphasis on Verification, Validation & Uncertainty Quantification — Uncertainty Quantification

Program Organizers: Jacob Hochhalter, University of Utah; Michael Sangid, Purdue University; Corbett Battaile, Sandia National Laboratories; Barron Bichon, Southwest Research Institutue

Tuesday PM
October 1, 2019
Room: D135
Location: Oregon Convention Center

Session Chairs: Barron Bichon, SwRI; Richard Russell, NASA

2:00 PM Invited
Uncertainty Quantification for Process-Structure-Property Linkages Extracted Using Materials Knowledge Systems Framework: *Surya Kalidindi*[1]; Ali Khosravani[1]; Andrew Castillo[1]; Andrew Marshall[1]; [1]Georgia Institute of Technology

2:40 PM
Uncertainty Quantification in the Mechanical Response of Crystal Plasticity Simulations: *Ritwik Bandyopadhyay*[1]; Veerappan Prithivirajan[1]; Michael Sangid[1]; [1]Purdue University

3:00 PM
Uncertainty Informed Decision Making in Inductive Design Exploration of Ti64.: *Gary Whelan*[1]; David McDowell[1]; [1]Georgia Institute of Technology

3:20 PM Invited
UQ Modeling of Structures and Materials Using the Hypercomplex Differentiation Method: *Harry Millwater*[1]; Matt Balcer[1]; Daniel Ramirez[1]; Arturo Montoya[1]; [1]University of Texas at San Antonio

3:40 PM Invited
Algorithms and Computational Tools for V&V: *Roger Ghanem*[1]; Zhiheng Wang[1]; [1]University of Southern California

4:10 PM Invited
A Generalized Bayesian Random Effects Model for Assessing Parameter Uncertainty in Materials Simulation: *Stephen Niezgoda*[1]; Denielle Ricciardi[1]; Oksana Chkrebtii[1]; [1]Ohio State University

4:30 PM
UQ for Forward Material Models and Dependency on Training Data Quality and Quantity Using a Bayesian Modeling Paradigm: *Denielle Ricciardi*[1]; Oksana Chkrebtii[1]; Stephen Niezgoda[1]; [1]The Ohio State University

4:50 PM Invited
Quantification of Uncertainty in Forging Process Induced Residual Stress and Associated Fatigue Life: *Dale Ball*[1]; Mark Ryan[1]; Joseph Yurko[2]; John Watton[2]; Adrian DeWald[3]; Michael Hill[3]; Bradford Cowles[4]; [1]Lockheed Martin Aeronautics Co.; [2]Arconic Technology Center; [3]Hill Engineering, LLC; [4]Cowles Consulting, LLC

Nanostructured Materials under Extreme Environments — Materials Designed for Radiation Environment II

Program Organizers: Jin Li, Purdue University; Assel Aitkaliyeva, University of Florida; Youxing Chen, University of North Carolina at Charlotte; Yue Liu, Shanghai Jiao Tong University; Shuai Shao, Louisiana State University

Tuesday PM
October 1, 2019
Room: D133
Location: Oregon Convention Center

Session Chairs: Jin Li, Purdue University; Youxing Chen, University of North Carolina at Charlotte

2:00 PM Invited
Effects of Nanoclusters on Radiation and Deformation Responses of Fe-based Alloys: *Meimei Li*[1]; Wei-Ying Chen[1]; Fallon Laliberte[2]; Jonathan Almer[1]; [1]Argonne National Laboratory; [2]RPI

2:30 PM Invited
Investigation of Helium Precipitates in Ta-Ti Composites: *Kelvin Xie*[1]; Sisi Xiang[1]; Ian McCue[1]; Michael Demkowicz[1]; [1]Texas A&M University

3:00 PM Invited
Irradiation Effects in Materials for Nuclear Applications: *Cheng Sun*[1]; [1]Idaho National Laboratory

3:30 PM Invited
Designing Nanocrystalline Steels Against Intense Irradiation by Grain Boundary Stabilization: *Tongde Shen*[1]; [1]Yanshan University

4:00 PM Invited
Complex Interactions of Grain Boundaries and Radiation Damage: *Khalid Hattar*[1]; Christopher Barr[1]; Brittany Muntifering[1]; Daniel Bufford[1]; Caitlin Taylor[1]; Stephen Foiles[1]; Fadi Abdeljawad[2]; Samuel Briggs[3]; [1]Sandia National Laboratories; [2]Clemson University; [3]Oregon State University

4:30 PM
Analysis of Nano-ferritic Alloys with Oxide Dispersoids in Fully Consolidated Mechanically Alloyed 14YWT Powder: *Rebecca Whitesell*[1]; Iver Anderson[2]; Stuart Maloy[3]; Emma White[2]; Timothy Prost[2]; G. Odette[4]; David Hoelzer[5]; [1]Iowa State University; [2]Ames Laboratory; [3]Los Alamos National Laboratory; [4]University of California, Santa Barbara; [5]Oak Ridge National Laboratory

4:50 PM
Thermal Stability of Ultrafine-grained FeCrAl Alloy Processed by Equal-channel Angular Pressing or High-pressure Torsion: *Maalavan Arivu*[1]; Andrew Hoffman[1]; Jiaqi Duan[1]; Haiming Wen[1]; [1]Missouri University of Science and Technology

Next Generation Biomaterials — Next Generation Biomaterials III

Program Organizers: Roger Narayan, University of North Carolina; Federico Rosei, INRS Centre for Energy, Materials and Telecommunications

Tuesday PM
October 1, 2019

Room: C122
Location: Oregon Convention Center

Session Chairs: Janet Gbur, Case Western Reserve University; Jaroslaw Drelich, Michigan Technological University

2:00 PM Invited
Translational Research at the Intersection of Engineering, Biology and Medicine: Opportunities and Challenges: *Bikramjit Basu*[1]; [1]Indian Institute of Science

2:20 PM Invited
Production of Wound Repair Biomaterials with Combined Manufacturing Techniques: Mohan Edirisinghe[1]; *Jubair Ahmed*[1]; [1]University College of London

2:40 PM Invited
Interaction between Biopolymers Derived from Biofilms and Various Metallic Materials: *Hideyuki Kanematsu*[1]; Reo Itoh[1]; Dana Barry[2]; Yuta Sakagami[1]; Noriyuki Wada[1]; Nobumitsu Hirai[1]; Akiko Ogawa[1]; Takeshi Kogo[1]; Daisuke Kuroda[1]; Katsuhiko Sano[3]; [1]National Institute of Technology (KOSEN), Suzuka College; [2]Clarkson University / SUNY Canton; [3]D&D Corporation

3:00 PM Invited
Fatigue and Fracture of Drawn Filled Tubes Used in Neuromodulation and Cardiovascular Applications: *Janet Gbur*[1]; John Lewandowski[1]; [1]Case Western Reserve University

3:20 PM Invited
Bioconjugated Nanoprobes for Tumor Specific Uptake and Localization: Shaista Ilyas[1]; Markus Schütz[1]; Alexander Renner[1]; Nighat Ullah[1]; *Sanjay Mathur*[1]; [1]Institute of Inorganic and Materials Chemistry

3:40 PM Invited
An Investigation of Breast Cancer Detection: From Tumor-specific Nanoparticles to Cell Mechanics: *Jingjie Hu*[1]; John Obayemi[2]; Yuxiao Zhou[3]; Jing Du[3]; Wole Soboyejo[2]; [1]Mayo Clinic; [2]Worcester Polytechnic Institute; [3]The Pennsylvania State University

4:00 PM
Silicon and Hydroxyapatite Reinforced Ti6Al4V for Articulating Surfaces of Load-bearing Implants: *Jose Avila*[1]; Amit Bandyopadhyay[1]; Susmita Bose[1]; [1]Washington State University

4:20 PM
Osteogenic Effects of Strontium-lithium-silver Hydroxyapatite Implants and Early Bone Tissue Healing: *Sam Robertson*[1]; Amit Bandyopadhyay[1]; Susmita Bose[1]; [1]Washington State University

Phase Transformations in Ceramics: Science and Applications — Experimental Studies on Structure and Control I

Program Organizers: Pankaj Sarin, Oklahoma State University; Waltraud Kriven, University of Illinois at Urbana-Champaign; Sanjay Khare, University of Toledo; Yu Zhong, Worcester Polytechnic Institute

Tuesday PM
October 1, 2019

Room: A104
Location: Oregon Convention Center

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

2:00 PM Invited
Realizing Novel Defect Ordering in Yttria Stabilized Zirconia via Ion Radiation: *Jessica Krogstad*[1]; [1]University of Illinois at Urbana-Champaign

2:30 PM
Influence of Annealing Temperature and Time on Phase Stability and Fracture Toughness of Rare-earth Stabilized Zirconia: *Archana Loganathan*[1]; Surendra Anantharaman[2]; Mohan Ponnuchamy[3]; Ashutosh Gandhi[4]; [1]Florida International University; [2]École Polytechnique Fédérale De Lausanne (EPFL), Switzerland; [3]Indian Institute of Technology, Madras; [4]Indian Institute of Technology, Bombay

2:50 PM
In Situ Investigation of Stress-induced Martensitic Transformation in Granular Shape Memory Ceramics: Hunter Rauch[1]; Yan Chen[2]; Ke An[2]; *Hang Yu*[1]; [1]Virginia Polytechnic Institute; [2]Oak Ridge National Laboratory

3:10 PM
Effect of Microstructure on Cyclic Phase Transformation Behavior in Shape Memory Zirconia: *Isabel Crystal*[1]; Alan Lai[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

3:30 PM Break

3:50 PM Invited
Avoiding Transformation-induced Cracking in ZrO_2 Shape-memory Ceramics: Constraints, Surfaces and Interfaces: Edward Pang[1]; *Christopher Schuh*[1]; [1]Massachusetts Institute of Technology

4:30 PM
The Effect of Zr^{4+} Co-Substitution on the Phase Transition and Thermal Expansion Properties of $RENbO_4$ Materials (RE = La^{3+}, Dy^{3+}, Y^{3+}): Daniel Lowry[1]; *Pankaj Sarin*[1]; [1]Oklahoma State University

4:50 PM Invited
Meso- and Micro-structural Design and Processing of Shape-memory and Superelastic Bulk Ceramics: Xiaomei Zeng[1]; Noriaki Arai[1]; *Katherine Faber*[1]; [1]California Institute of Technology

Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals — Metal Injection Moulding and Powder Processing

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

Tuesday PM
October 1, 2019

Room: F149
Location: Oregon Convention Center

Session Chair: Ma Qian, RMIT University

2:00 PM Keynote
Development of Water-soluble Binders for Titanium Metal Injection Moulding (Ti-MIM) to Produce High Performance Components: *Peng Cao*[1]; Muhammed Hayat[1]; [1]University of Auckland

2:40 PM Keynote
Metal Injection Molding of Titanium Alloys and its Applications in the Industry: *Peng Yu*[1]; [1]Southern University of Science and Technology

3:20 PM
Fabrication of La_2O_3 Dispersed Mo-Si-B Alloys and Its Mechanical Properties: *Won June Choi*[1]; Chun Woong Park[1]; Jung Hyo Park[2]; Jong Min Byun[3]; Young Do Kim[1]; [1]Hanyang University; [2]Agency for Defense Development; [3]Seoul National University of Science & Technology

3:40 PM
Phase Diagram and Mechanical Properties of a $CoCrFeNi_{1-x}Ti_x$ High Entropy Alloy Fabricated by Mechanical Alloying: *Geraldine Anis*[1]; Mostafa Youssef[1]; Moataz Attallah[2]; Hanadi Salem[1]; [1]The American University in Cairo; [2]University of Birmingham

4:00 PM
Powder Hot Isostatic Pressing of Pure Nb: Influence of Powder Characteristics on the Mechanical Properties: *Alessandro Sergi*[1]; Raja Khan[2]; Nicholas Adkins[1]; Moataz Attallah[1]; [1]University of Birmingham; [2]TWI Ltd

4:20 PM Invited
Ultrasonic Consolidation of Nanocrystalline Powders: *Zachary Cordero*[1]; [1]Rice University

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 1, 2019

Room: D139
Location: Oregon Convention Center

Session Chairs: Hideyuki Kanematsu, National Institute of Technology (KOSEN), Suzuka College; Edward Ripley, Y-12 National Security Complex

2:00 PM Invited
Vapor Dephosphorization Kinetics from Steel Making Slag by Microwave Rapid Heating: *Noboru Yoshikawa*[1]; Manami Sunako[1]; Kazunori Miyamoto[1]; Keita Kawahira[1]; Shoji Taniguchi[1]; [1]Tohoku University

2:20 PM Invited
In-situ High Spatial Resolution Two-color Thermography in Micrwoave Selective Heating System: *Jun Fukushima*[1]; Hirotsugu Takizawa[1]; [1]Tohoku University

2:40 PM Invited
Proposal of Mining Method of Methane Hydrate by Microwave: *Shin Nakatani*[1]; Motohiko Tanaka[1]; Sato Motoyasu[1]; Masao Yukumoto[1]; [1]Chubu University

3:00 PM
Magnetic Field-Assisted Freeze Casting of Porous Ceramic Structures: *Jihyung Lee*[1]; Robert Wheeler[1]; Samir Aouadi[1]; Diana Berman[1]; Marcus Young[1]; Raymond Brennan[2]; [1]University of North Texas; [2]U.S Army Research Laboratory

3:20 PM
Stage I Laser Flash Sintering: *Deborah Hagen*[1]; Desiderio Kovar[1]; Joseph Beaman[1]; [1]University of Texas at Austin

3:40 PM
Thermal Analysis of a High Temperature Coaxial Dielectric Test Cell: *Robert Tempke*[1]; Candice Ellison[1]; Christina Wildfire[1]; Terence Musho[2]; Dushyant Shekhawat[1]; [1]National Energy Technology Laboratory; [2]West Virginia University

4:00 PM
Exploration of Phase Transformations in Alnico and Its Implications for Magnetic Annealing: *Emily Rinko*[1]; Iver Anderson[2]; Tim Prost[2]; Pratik Ray[2]; Emma White[2]; Wei Tang[2]; Lin Zhou[2]; Matthew Kramer[2]; [1]Iowa State University; [2]Ames Laboratory

4:20 PM
Modeling Microstructural Evolution under Applied Magnetic Fields: *Heather Murdoch*[1]; Efrain Hernandez[1]; Philip Goins[1]; Anit Giri[1]; [1]US Army Research Laboratory

PSDK XIV: Phase Stability and Diffusion Kinetics — Thermodynamics and Modeling

Program Organizers: Michael Gao, National Energy Technology Laboratory; Hans Seifert, Karlsruhe Institute of Technology; Zi-Kui Liu, Pennsylvania State University; Fan Zhang, CompuTherm LLC; Richard Otis, Jet Propulsion Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory

Tuesday PM
October 1, 2019

Room: E144
Location: Oregon Convention Center

Session Chairs: Dongwon Shin, Oak Ridge National Laboratory; Fritz Koermann, Fritz Koermann

2:00 PM Invited
Revisiting Cast Al-Cu Alloy with Advanced Characterization and Modern Supercomputing: *Dongwon Shin*[1]; Shyam Amit[1]; Lawrence Allard[1]; Matthew Chisholm[1]; James Morris[1]; J. Haynes[1]; [1]Oak Ridge National Laboratory

2:20 PM
Effect of Non-dilute Fe and Mo on Atomic Ordering in fcc Ni-Cr Alloys – A First-principles Study: *Jia-Hong Ke*[1]; Julie Tucker[1]; [1]Oregon State University

2:40 PM
Thermodynamic Reassessment of Ti-Al-Fe Ternary System Including L21 Ordering, t2 and t3 Descriptions: *Zhi Liang*[1]; Peisheng Wang[2]; Carelyn Campbell[1]; Ursula Kattner[1]; [1]National Institute of Standards and Technology; [2]Northwestern University

3:00 PM
CALPHAD in the Cloud: Uncertainty Quantification and Propagation in ICME: *Changning Niu*[1]; Abhinav Saboo[1]; Ramon Frey[1]; Jiadong Gong[1]; Gregory Olson[1]; [1]Questek Innovations

3:20 PM Invited
Phase Stability and Mechanical Properties of High Entropy and Chemically Complex Alloys: Yuji Ikeda[1]; Prashanth Srinivasan[2]; Jörg Neugebauer[1]; Blazej Grabowski[3]; Tatiana Kostiuchenko[4]; Alexander Shapeev[4]; *Fritz Koermann*[2]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]TU Delft; [3]University of Stuttgart; [4]Skolkovo Institute of Science and Technology

3:40 PM Invited
Correlation of Local Order in Multicomponent Alloys with Microstructural Evolution: *Mitra Taheri*[1]; [1]Drexel University; Johns Hopkins University

4:00 PM
Thermodynamic Modeling for Atomic Layer Etching: *Nagraj Kulkarni*

4:20 PM
Thermodynamic Simulation and Experimental Validation of Phase Stability in Ni-based Superalloys: *Kyle Ventura*[1]; David Beaudry[1]; Alex Aviles[1]; Gerhard Fuchs[1]; [1]University of Florida

4:40 PM
Close-packed Phases in Nickel-based Superalloys – Investigation of Stabilising Subsystems Using Siffusion Multiples: *Robert Popp*[1]; Florian Scherm[1]; Erwin Povoden-Karadeniz[2]; Ernst Kozeschnik[2]; Thomas Göhler[3]; Uwe Glatzel[1]; [1]University of Bayreuth; [2]TU Wien; [3]MTU Aero Engines

Retained Austenite for High and Ultrahigh Strength Steels — Retained Austenite for High and Ultrahigh Strength Steels

Program Organizer: Mahesh Somani, University of Oulu

Tuesday PM
October 1, 2019

Room: C125
Location: Oregon Convention Center

Session Chairs: Sung Joon Kim, POSTECH; Mahesh Somani, University of Oulu

2:00 PM Introductory Comments

2:10 PM
Austenite Stability in Bainite Steel after Austempering Heat Treatments: *Giovani Ribamar*[1]; Arthur Nishikawa[2]; Hélio Goldenstein[1]; [1]Universidade de São Paulo; [2]Delft University of Technology

2:30 PM
Medium-carbon TRIP-aided Bainitic Ferrite Steels: *Seong Hoon Kim*[1]; Dong-Woo Suh[1]; [1]POSTECH

2:50 PM
Retained Austenite in Nanobainite Bearing Steel after Austempering Heat Treatments: *Giovani Ribamar*[1]; Arthur Nishikawa[2]; Hélio Goldenstein[1]; [1]Universidade de São Paulo; [2]Delft University of Technology

3:10 PM
Novel Concepts for Tough Ductile Ultra-high Strength Martensitic / Bainitic Steels Containing Finely Divided Retained Austenite: *Mahesh Somani*[1]; Pekka Kantanen[1]; Pentti Kaikkonen[1]; Jaakko Hannula[1]; Sakari Pallaspuro[1]; David Porter[1]; Jukka Kömi[1]; Pentti Karjalainen[1]; Devesh Misra[2]; [1]University of Oulu; [2]University of Texas at El Paso

3:30 PM Break Coffee

3:50 PM
Effect of Nickel on Austenite Stabilization during Quenching and Partitioning Process in Medium-Mn Steels: *Sudhindra Ayenampudi*[1]; Carola Celada Casero[1]; Jilt Sietsma[1]; Maria Santofimia Navarro[1]; [1]Delft University of Technology

4:10 PM
Application of Room-temperature Quenching and Partitioning on Medium Mn Steel: *Woojun Kim*[1]; Sung-Joon Kim[1]; [1]GIFT, Postech

4:30 PM
Carbon Partitioning between Ferrite and Austenite in Medium-Mn Steel and Its Impact on Mechanical Properties: *Yan Ma*[1]; Binhan Sun[2]; Wenwen Song[1]; Wolfgang Bleck[1]; [1]RWTH Aachen University; [2]Max-Planck-Institut für Eisenforschung GmbH

4:50 PM
Tensile Deformation Characteristics and Austenite Transformation Behavior of Advanced High Strength Steel Considering Adiabatic Heating: *Christopher Finfrock*[1]; Gus Becker[1]; Trevor Ballard[1]; Grant Thomas[2]; Kester Clarke[1]; Amy Clarke[1]; [1]Colorado School of Mines; [2]AK Steel

Sintering and Related Powder Processing Science and Technologies — Fundamentals of Sintering

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

Tuesday PM
October 1, 2019

Room: E142
Location: Oregon Convention Center

Session Chairs: Amanda Krause, University of Florida; Hadas Sternlicht, Brown University

2:00 PM Invited
Electrochemically-driven Abnormal Grain Growth of Ionic Ceramics: Vikrant Karrra[1]; Wolfgang Rheinheimer[1]; *Edwin Garcia*[1]; [1]Purdue University

2:40 PM Invited
Surface and Grain Boundary Segregation during Nanopowders Preparation and Sintering: *Douglas Gouvêa*[1]; [1]University of Sao Paulo

3:10 PM Invited
The Role of Grain Boundaries in Nanoscale Sintering: Atomistic and Mesoscale Modeling Studies: *Fadi Abdeljawad*[1]; [1]Clemson University

3:40 PM
Neck Growth in Sintering of Silver Nanowires: *Md Jahangir*[1]; Rajiv Malhotra[1]; [1]Rutgers University

4:00 PM
Simulation of Densification of Contacting Particles using a Two-dimensional Monte Carlo Model for Solid State Sintering: *Youngkyun Son*[1]; Minji Kim[1]; Sukbin Lee[1]; [1]UNIST

4:20 PM
Stochastic Modeling of the Effect of Structural Randomness on the Mechanical Behaviors of 3D Printed Metallic Powders: *Skylar Mays*[1]; Mujan Seif[1]; Katherine Moody[1]; Matthew Beck[1]; [1]University of Kentucky

Surface Properties of Biomaterials — Additive Manufactured & Surface-modified Biomaterials

Program Organizers: Ryan Bock, SINTX Technologies; Jason Langhorn, DePuy Synthes Joint Reconstruction; Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University; Mangal Roy, Indian Institute of Technology-Kharagpur; Venu Varanasi, University of Texas at Arlington

Tuesday PM
October 1, 2019

Room: C121
Location: Oregon Convention Center

Session Chairs: Amit Bandyopadhyay, Washington State University; Ryan Bock, SINTX Technologies; Susmita Bose, Washington State University

2:00 PM Invited
3D Printing of Microstructured and Nanostructured Surfaces for Medical Applications: *Roger Narayan*[1]; [1]University of North Carolina

2:40 PM
Enhanced Osteogenesis of 3D Printed Scaffolds by Cissus Quadrangularis-loaded Polydopamine Coatings: *Sam Robertson*[1]; Susmita Bose[1]; [1]Washington State University

3:00 PM
Surface Chemical Structure and in Vitro Biological Behavior of Patterned Bioactive Amorphous Silicon Oxynitride (SiONx): *Kamal Awad*[1]; Jian Huang[1]; Leticia Brotto[1]; Pranesh Aswath[1]; Marco Brotto[1]; Venu Varanasi[1]; [1]University of Texas at Arlington

3:20 PM
Solid Freeform Fabrication of Functionally Graded Polymer-ceramic Composite Bone Scaffolds: *Arjak Bhattacharjee*[1]; Amit Bandyopadhyay[1]; Susmita Bose[1]; [1]Washington State University

3:40 PM Invited
Interaction of Blood Plasma Proteins on Superhemophobic Titania Nanotube Surfaces: Roberta Maia Sabino[1]; *Ketul Popat*[1]; [1]Colorado State University

4:20 PM
Direct Comparison of Additively Manufactured Porous Titanium and Tantalum Implants Towards in Vivo Osseointegration: Amit Bandyopadhyay[1]; *Indranath Mitra*[1]; Anish Shivaram[1]; Susmita Bose[1]; [1]Washington State University

4:40 PM
Anodization of Titanium Implant Alloys to Incorporate Phosphorous and Promote Bioactivity: *Haden Johnson*[1]; Caleb Hardman[1]; Morgan Doukas[1]; R Williamson[1]; Amol Janorkar[1]; Michael Roach[1]; [1]University of Mississippi Medical Center

Surface Protection for Enhanced Materials Performance: Science, Technology, and Application — CMAS Degradation and Mitigation / Environmental Barrier Coatings

Program Organizers: Kang Lee, NASA Glenn Research Center; Jun Song, McGill University; Yutaka Kagawa, University of Tokyo; 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; Stephen Yue, McGill University; Richard Chromik, McGill University

Tuesday PM
October 1, 2019

Room: D137
Location: Oregon Convention Center

Session Chairs: Kang Lee, NASA Glenn Research Center; Valerie Wiesner, NASA Glenn Research Center

2:00 PM Invited
Understanding and Mitigating the CMAS Problem in Gas Turbine Coatings: *Carlos Levi*[1]; David Poerschke[2]; Collin Holgate[1]; William Summers[1]; Frank Zok[1]; [1]University of California, Santa Barbara; [2]University of Minnesota

2:40 PM
Some Implications to CMAS Infiltration and Arrest Kinetics of Gradual Application: *Eric Jordan*[1]; Byung Jun[1]; [1]University of Connecticut

3:00 PM
Investigation of Environmental Barrier Coating Degradation by Molten Calcium-Magnesium-Aluminosilicate (CMAS) at Low Concentrations: *Valerie Wiesner*[1]; Gustavo Costa[2]; John Setlock[3]; Kang Lee[1]; Bryan Harder[1]; [1]NASA Glenn Research Center; [2]Vantage Partners, LLC; [3]University of Toledo

3:20 PM Invited
Manufacture of Environmental Barrier Coatings by Thermal Spray Techniques: *Robert Vassen*[1]; Emine Bakan[1]; Seongwong Kim[2]; Daniel Mack[1]; Olivier Guillon[3]; [1]Forschungszentrum Jülich GmbH; [2]Forschungszentrum Jülich GmbH; Korea Institute of Ceramic Engineering and Technology (KICET); [3]Forschungszentrum Jülich GmbH; Jülich Aachen Research Alliance

3:50 PM Invited
Role of Process Induced Chemical Composition Changes and Rapid Solidification on the Characterestics of Plasma Sprayed Yb2Si2O7 Environmental Barrier Coatings: *Sanjay Sampath*[1]; Eugenio Garcia[1]; [1]Stony Brook University

4:20 PM
High-temperature, High-velocity Water Vapor Studies of Environmental Barrier Coating Candidates: *Mackenzie Ridley*[1]; Elizabeth Opila[1]; [1]University of Virginia

Thermodynamics of Materials in Extreme Environments — Thermodynamics and Long Term Stability of Materials for Fuel Cells and Other Energy Applications

Program Organizers: Kyle Brinkman, Clemson University; Kristina Lilova, University California Davis; Alexandra Navrotsky, University California Davis; Jake Amoroso, Savannah River National Laboratory; Fei Peng, Clemson University; Xingbo Liu, West Virginia University; Gustavo Costa , NASA; Xiaofeng Guo, Washington State University

Tuesday PM
October 1, 2019

Room: B119
Location: Oregon Convention Center

Session Chair: Xingbo Liu, West Virginia University

2:00 PM Invited
Ab-Initio Screening for New Solid Oxide Fuel Cell Cathodes: *Dane Morgan*[1]; Ryan Jacobs[1]; [1]University of Wisconsin - Madison

2:30 PM
***Ab Initio* Thermodynamic Modeling of Hydrogen Defects and Transport for Solid Oxide Fuel Cells and Tritium Producing Burnable Absorber Rod Applications:** *Yueh-Lin Lee*[1]; Yuhua Duan[1]; Dane Morgan[2]; Hari Paudel[1]; Dan Sorescu[1]; Harry Abernathy[3]; Gregory Hackett[1]; [1]National Energy Technology Laboratory; [2]University of Wisconsin-Madison; [3]Leidos

3:00 PM Invited
Thermodynamic and Structural Evolutions of Solid State Materials under 2D or 3D Confinement: Xianghui Zhang[1]; Cody Cockreham[1]; Hongwu Xu[1]; Xiaofeng Guo[1]; *Di Wu*[1]; [1]Washington State University

3:30 PM
Effect of Refractory Oxide Coatings on the Thermodynamic Stability of the $Yb_{14}MnSb_{11}$ Thermoelectric Compound at High Temperatures: A CALPHAD Study: *Jorge Paz Soldan Palma*[1]; Yi Wang[1]; Obed Villalpando[2]; Richard Otis[2]; Kurt Star[2]; Fivos Drymiotis[2]; Ravi Vilapanur[2]; Jean-Pierre Fleurial[2]; Zi-Kui Liu[1]; [1]Pernnsylvania State University; [2]Jet Propulsion Laboratory

3:50 PM Invited
Thermodynamic Considerations in Solid Oxide Fuel Cells; Data Interconsistency, Transformation, Reactions and Microstructure Changes: *Harumi Yokokawa*[1]; [1]University of Tokyo

Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications — High Entropy Alloys and High Temperature Materials

Program Organizers: Ali Yousefiani, Boeing Research And Technology; Troy Topping, California State University, Sacramento; Robert Dillon, NASA Jet Propulsion Laboratory; Linruo Zhao, National Research Council of Canada

Tuesday PM
October 1, 2019

Room: D140
Location: Oregon Convention Center

Session Chair: Ali Yousefiani, Boeing Research and Technology

2:00 PM
Microstructural Characterization and High Temperature Oxidation of High Entropy Nb-Cr-W-Ta-V alloy between 600 and 1400oC: *Shailendra Varma*[1]; Sabastian Moncayo[1]; Ramana Chintalapalle[1]; [1]University of Texas

2:20 PM
First-principles Methods of Investigating Stacking Fault Energies in Refractory BCC High-entropy Alloys: Joshua Strother[1]; *Chelsey Hargather*[1]; [1]New Mexico Institute of Mining and Technology

2:40 PM
Deformation Behavior of Al0.4CoCrFeNi High Entropy Alloy: *Anumat Sittiho*[1]; Jadzia Graves[1]; Indrajit Charit[1]; Rajiv Mishra[2]; [1]University of Idaho; [2]University of North Texas

3:00 PM
Creep of High Entropy Alloys: *Kevin Garber*[1]; Bhaskar Majumdar[1]; [1]New Mexico Tech

3:20 PM Invited
Development of Nb-Si Based Ultrahigh Temperature Alloys: *Xiping Guo*[1]; Song Zhang[1]; Haisheng Guo[1]; Yin Wang[1]; Yanqiang Qiao[1]; [1]Northwestern Polytechnical University

3:40 PM
Mechanical Behavior of Mo Solid Solutions with Minor B and Si Additions: *Longfei Liu*[1]; John Perepezko[1]; [1]University of Wisconsin- Madison

11th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Energy, Sustainability, and Biobased Materials I

Program Organizers: Surojit Gupta, University of North Dakota; Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technololgy; John Wolodko, University of Alberta; Christopher Taylor, DNV GL; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin; 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

Wednesday AM
October 2, 2019

Room: Portland Ballroom 255
Location: Oregon Convention Center

Session Chairs: Richard Sisson, Worcester Polytechnic Institute; Daniel Koop, Rutgers University; Luca Masi, Granta Design

8:00 AM Invited
Theory Based Design of the Morphology and Electronic Properties of Solution-processed Thin Films in Perovskite Solar Cells: *Soumik Banerjee*[1]; MFN Taufique[1]; Rabi Khanal[2]; Samrat Choudhury[2]; [1]Washington State University; [2]University of Idaho

8:20 AM Invited
Introducing Sustainability in Materials Selection: *Luca Masi*[1]; [1]Granta Design / Ansys Inc.

8:40 AM
3D Printing of Soy Hull Fiber Reinforced Thermoplastic Copolymer Composites: Vamsi Balla[1]; Dattu Tadimeti[1]; *Kunal Kate*[1]; Jagannadh Satyavolu[1]; [1]University of Louisville

9:00 AM
A Novel Bio-based Deicer Additive for Improving the Sustainability of Buried Pipeline and the Environment: *Mehdi Honarvar Nazari*[1]; Xianming Shi[1]; [1]Washington State University

9:20 AM
Separation of Rare Earth Elements from Nd Magnet Scraps Using Gas Electrodes in Molten Chlorides: *Hirokazu Konishi*[1]; Yuichiro Koizumi[1]; [1]Osaka University

9:40 AM Invited
Towards Efficient Extraction of 'Oil' from Oil Shales: *Kalpana Katti*[1]; HM Nasrullah Faisal[1]; Keshab Thapa[1]; Dinesh Katti[1]; [1]North Dakota State University

10:00 AM Break

10:20 AM Invited
Sustainable Technology for Bauxite Residue Processing: *Brajendra Mishra*[1]; Sumedh Gostu[2]; [1]Worcester Polytechnic Institute; [2]Air Liquide

10:40 AM
Hydrothermal Vapor Synthesis: Sustainable Production of Inorganic Oxides: *Daniel Kopp*[1]; Richard Riman[1]; [1]Rutgers, The State University of New Jersey

11:00 AM Invited
Oxide-based Ceramic Matrix Composites for Army Rotorcraft: Michael Walock[1]; Vann Heng[2]; Anindya Ghoshal[1]; Muthuvel Murugan[1]; *Andy, Nieto*[3]; [1]US Army Research Laboratory; [2]The Boeing Company; [3] Naval Postgraduate School

11:20 AM
A Study of an Alternative Carbon Source to Improve Environmental Sustainability in Steel Production: *Blake Stewart*[1]; Haley Doude[1]; Terry Taylor[2]; Morgan Abney[2]; Hongjoo Rhee[1]; [1]Center for Advanced Vehicular Systems; [2]Marshall Space Flight Center

ACerS Robert B. Sosman Award Symposium: From Carbides to Carbons - from Bulk to Nano — Session I

Program Organizer: Babak Anasori, Drexel University

Wednesday AM
October 2, 2019

Room: Portland Ballroom 253
Location: Oregon Convention Center

Session Chairs: Michael Naguib, Tulane University; Babak Anasori, Indiana University-Purdue University Indianapolis

9:10 AM Invited
Hydrothermal Carbons: Synthesis and Reaction of Various Nano-carbon Materials under Hydrothermal Conditions: *Masahiro Yoshimura*[1]; [1]National Cheng Kung University

9:40 AM Invited
3D Printed Porous Carbon from mm to µm Resolution: Hendryk Steldinger[1]; *Bastian Etzold*[1]; [1]TU Darmstadt

10:10 AM Break

10:30 AM Invited
Carbon-based Nanocomposites for Li-ion Batteries and Supercapacitors: *Gleb Yushin*[1]; [1]Georgia Institute of Technology

11:00 AM Invited
Thermodynamics of Transition Metal Carbide Formation: *William Fahrenholtz*[1]; [1]Missouri University of Science and Technology

11:30 AM Invited
Two-dimensional Transition Metal Carbides and Nitrides "MXenes" from Layered Bulk MAX Phases; Synthesis, Properties and Applications: *Michael Naguib*[1]; [1]Tulane University

Actinide and Lanthanide Materials III — Oxides, Compounds, Metals

Program Organizers: Clarissa Yablinsky, Los Alamos National Laboratory; Ryan Stillwell, Lawrence Livermore National Laboratory; Kester Clarke, Colorado School of Mines; Clinique Brundidge, Naval Nuclear Laboratory; Adam Farrow, Los Alamos National Laboratory; Curt Lavender, Battelle - Pacific Northwest National Laboratory; Douglas Burkes, Pacific Northwest National Laboratory

Wednesday AM
October 2, 2019

Room: C120
Location: Oregon Convention Center

Session Chairs: Ryan Stillwell, Lawrence Livermore National Laboratory; Clarissa Yablinsky, Los Alamos National Laboratory

8:00 AM Invited
Using Neutron Diffraction to Characterize the Microstructure of Plutonium and Its Alloys: *Donald Brown*[1]; Alice Smith[1]; J. Zhang[1]; Bjorn Clausen[1]; F. J. Freibert,[1]; [1]Los Alamos National Laboratory

8:30 AM
Thermal Properties and Structure Evolution during Cryogenic Thermal Cycling of a d-phase 239PuGa Alloy: *Alice Smith*[1]; Franz Freibert[1]; Sven Vogel[1]; Jianzhong Zhang[1]; [1]Los Alamos National Laboratory

8:50 AM
Determination of Damage in Plutonium DSC Samples: *Meghan Gibbs*[1]; Miranda Williams[1]; Tomas Martinez[1]; Carlos Archuleta[1]; [1]Los Alamos National Laboratory

9:10 AM
Thermochemical Models to Address Impurities in Actinide Alloys: *Emily Moore*[1]; Alexander Landa[1]; Scott McCall[1]; Stephen Stout[1]; Perron Aurélien[1]; [1]Lawrence Livermore National Laboratory

9:30 AM
Differential Scanning Calorimetry and Evolved Gas Analysis of Plutonium Tetrafluoride PuF_4 (LA-UR-19-22789): *David Wayne*[1]; [1]Los Alamos National Laboratory

9:50 AM
New Insights into Early Stage Uranium Hydride Growth: *Terry Holesinger*[1]; Matthew Schneider[1]; Matthew Janish[1]; Edward Holby[1]; Eric Tegtmeier[1]; Andrew Richards[1]; Roland Schulze[1]; [1]Los Alamos National Laboratory

10:10 AM Break

10:30 AM Invited
Possible Structural Quantum Phase Transition in UCr_2Si_2 Accessed Through Cr to Ru Chemical Substitution: *Ryan Baumbach*[1]; [1]National High Magnetic Field Laboratory

11:00 AM
Synthesis and Pyrolysis of Uranium Borohydride: *Patrick Campbell*[1]; Andrew Lange[1]; Selim Elhadj[1]; [1]Lawrence Livermore National Laboratory

11:20 AM
Hydride-dehydride Production of Uranium-niobium Powder Feedstocks: *Ryan Stillwell*[1]; Cherie Schaeffer-Cuellar[1]; Scott Simpson[1]; Kevin Huang[1]; Jason Jeffries[1]; [1]Lawrence Livermore National Laboratory

Additive Manufacturing of Glass, Ceramics and Composites — Additive Manufacturing of Glass, Ceramics and Composites IV

Program Organizers: Tobias Schaedler, Hrl Laboratories Llc; Matthew Dickerson, Air Force Research Laboratory; Rebecca Dylla-Spears, Lawrence Livermore National Laboratory; Chang-Jun Bae, Korea Institute of Materials Science (KIMS)

Wednesday AM
October 2, 2019

Room: B113
Location: Oregon Convention Center

Session Chair: Matthew Dickerson, Air Force Research Laboratory

8:00 AM Invited
The Glassomer Technology – Glass Processing in the 21st Century: *Bastian Rapp*[1]; [1]Albert-Ludwigs University of Freiburg

8:30 AM
3d Printed Glass Optics with Tailored Composition: *Rebecca Dylla-Spears*[1]; Du Nguyen[1]; Nikola Dudukovic[1]; Timothy Yee[1]; Koroush Sasan[1]; Tyler Fears[1]; Frederick Ryerson[1]; Michael Johnson[1]; Oscar Herrera[1]; Lana Wong[1]; [1]Lawrence Livermore National Laboratory

8:50 AM
Direct Ink Writing of Silica-titania Glass: Prediction and Tuning of Ink Rheology: *Nikola Dudukovic*[1]; Megan Ellis[1]; Moira Foster[1]; Lana Wong[1]; Du Nguyen[1]; Timothy Yee[1]; Frederick Ryerson[1]; Tayyab Suratwala[1]; Eric Duoss[1]; Rebecca Dylla-Spears[1]; [1]Lawrence Livermore National Laboratory

9:10 AM
Titanium Diffusion in SiO_2 Glass – An Evaluation of Lengths Scales in AM Parts: *Andrew Lange*[1]; Leonardus Bimo Bayu Aji[1]; Koroush Sasan[1]; Rebecca Dylla-Spears[1]; [1]Lawrence Livermore National Laboratory

9:30 AM
Mechanical and Kinetic Studies on the Refractory Fused Silica of Integrally Cored Ceramic Mold Fabricated by Additive Manufacturing: *Chang-Jun Bae*[1]; John Halloran[2]; [1]Korea Institute of Materials Science (KIMS); [2]University of Michigan

10:00 AM Break

10:20 AM Invited
Innovative Glass and Ceramic Components Made by Suspension-based and Thermoplastic Additive Manufacturing Methods: *Tassilo Moritz*[1]; Uwe Scheithauer[1]; Steven Weingarten[1]; Eric Schwarzer[1]; Johannes Abel[1]; Jochen Schilm[1]; Dörte Wagner[1]; [1]Fraunhofer IKTS

10:50 AM
Diatom-based 3D Printed Materials with Many Levels of Hierarchy: John Gardner[1]; Benjamin Lazarus[1]; Anna Song[1]; *Hannes Schniepp*[1]; [1]The College of William & Mary

11:10 AM
Additive Manufacturing and Mechanical Performance of Architectured Cement-based Materials: *Mohamadreza Moini*[1]; Jan Olek[1]; Jeffrey Youngblood[1]; Pablo Zavattieri[1]; [1]Purdue University

11:30 AM
Sintering and Ag-infiltration of 3D-extrusion-printed SnO_2 Scaffolds: *Pengyu Chen*[1]; Christoph Kenel[1]; Yaping Wang[2]; David Dunand[1]; [1]Northwestern University; [2]Xi'an Jiaotong University

Additive Manufacturing of Metals: Microstructure and Material Properties of Nickel-based Alloys — Properties and Performance of AM Materials

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

Wednesday AM
October 2, 2019

Room: B117
Location: Oregon Convention Center

Session Chair: Sudarsanam Babu, University of Tennessee

8:00 AM
Effect of Processing Parameters on Density, Surface Roughness and Mechanical Properties of Hastelloy X Manufactured by Electron Beam Melting: *Amal Shaji Karapuzha*[1]; Darren Fraser[2]; Xinhua Wu[1]; Aijun Huang[1]; [1]Monash Centre for Additive Manufacturing (MCAM), Monash University; [2]CSIRO

8:20 AM
High Temperature Air Oxidation Behavior of Hastelloy X Processed by Electron Beam Melting (EBM) and Selective Laser Melting (SLM): *Marie Romedenne*[1]; Sebastien Dryepondt[1]; Rishi Pillai[1]; [1]Oak Ridge National Laboratory

8:40 AM
Corrosion Studies on Inconel 718 Produced by Laser Powder Bed Manufacturing: Mythreyi O.V[1]; Raja A[1]; Nagesh B.K[2]; *Jayaganthan R*[1]; [1]Indian Institute of Technology Madras; [2]Gas Turbine Research Establishment, DRDO

9:00 AM
Stress Corrosion Cracking Resistance of Additively Manufactured Nickel Alloy UNS N07718 and UNS N09946 in Chloride-containing Environments: *Madison Burns*[1]; Matthias Gieseke[1]; Christoph Wangenheim[1]; [1]Baker Hughes, a GE Company

9:20 AM
Tribocorroison Behavior of Inconel 718 Fabricated by Laser Powder Bed Fusion Based Additive Manufacturing: *Pankaj Kumar*[1]; Arpith Siddaiah[1]; Javed Akram[2]; Pradeep Menezes[1]; Mano Misra[1]; [1]University of Nevada, Reno; [2]ANSYS

9:40 AM
Creep and Oxidation Performance of Alloy 282 Fabricated by Electron Beam Melting: *Sebastien Dryepondt*[1]; Mike Kirka[1]; Patxi Fernandez-Zelaia[1]; Yousub Lee[1]; Kinga Unocic[1]; [1]Oak Ridge National Laboratory

10:00 AM Break

10:20 AM
Influence of Geometry on Process-Structure-Property Relationships in Electron Beam Melted Ni-based Superalloys: *Patxi Fernandez-Zelaia*[1]; Michael Kirka[1]; Sebastien Dryepondt[1]; Yousub Lee[1]; [1]Oak Ridge National Laboratory

10:40 AM
The Creep Behavior of Additively Manufactured Inconel 625: Michael Kassner[1]; *Kwangtae Son*[1]; Lyle Levine[2]; Thien Phan[2]; Mark Stoudt[2]; Kee-Ahn Lee[3]; [1]University of Southern California; [2]NIST; [3]Inha University

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing of Miscellaneous Non-ferrous Alloys

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

Wednesday AM
October 2, 2019

Room: B115
Location: Oregon Convention Center

Session Chair: Prashanth Konda Gokuldoss, Tallinn University of Technology

8:00 AM Invited
Additive Manufacturing of Implantable Biomaterials: Processing Challenges, Biocompatibility Assessment and Clinical Translation: *Bikramjit Basu*[1]; [1]Indian Institute of Science

8:30 AM
Milling of Ti-64Al-4V for in Space Manufacturing of 3D-printed Metal Structures: *Curtis Hill*[1]; [1]NASA, Marshall Space Flight Center

8:50 AM
Additive Manufacturing of Pure Magnesium: Densification Behavior, Microstructural Evolution, and Mechanical Properties: *Bandar AlMangour*; Abdulaziz AlHazaa[1]; Dariusz Grzesiak[2]; Ahmad Sorour[3]; [1]Department of Physics & Astronomy, College of Science, King Saud University; [2]Department of Mechanical Engineering and Mechatronics, West Pomeranian University of Technology, Szczecin; [3]Center of Research Excellence in Corrosion, Research Institute, King Fahd University of Petroleum and Minerals

9:10 AM
Effect of Processing Conditions on Mechanical Properties of Copper Fabricated Using Electron Beam Powder Bed Fusion: *Prithwish Tarafder*[1]; Christopher Ledford[1]; Timothy Horn[1]; Magnus Ahlfors[2]; Joel Alfano[3]; Harvey West[1]; Christopher Rock[1]; [1]North Carolina State University; [2]Quintus Technologies; [3]Siemens

9:30 AM
Development of Parameters and Comparison of Mechanical and Microstructural Properties of Tungsten Nickel Iron (W-Ni-Fe) with Parts Fabricated from Laser Powder Bed Fusion (PBF): *Michael Brand*[1]; Colt Montgomery[1]; Robin Pacheco[1]; Joel Montalvo[1]; Jessica Lopez[1]; Adam Wachtor[1]; John Carpenter[1]; [1]Los Alamos National Laboratory

9:50 AM
Effect of Heat Treatments on Compressive Properties of Lattice-structured AlSi10Mg Alloy Fabricated by Selective Laser Melting: *Asuka Suzuki*[1]; Keito Sekizawa[1]; Mulin Liu[1]; Takafumi Wada[1]; Naoki Takata[1]; Makoto Kobashi[1]; [1]Nagoya University

10:10 AM Break

10:30 AM
Effect of Sample Dimensions on Microstructure of Selectively Laser Melted AlSi10Mg Alloy: *Naoki Takata*[1]; Hirohisa Kodaira[1]; Asuka Suzuki[1]; Makoto Kobashi[1]; [1]Nagoya University

10:50 AM
Fatigue Life of Additively Manufactured AlSi10Mg Produced by Powder Bed Fusion: *Daniel Urban*[1]; Kevin Chasse[1]; Marc Heffes[1]; Walter Myers[1]; Edward Martin[1]; Noe Rodriguez[1]; [1]Northrop Grumman Systems Corporation

Additive Manufacturing of Metals: Post Processing — HIP and Heat Treatment II

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

Wednesday AM
October 2, 2019

Room: B110
Location: Oregon Convention Center

Session Chair: Carter Keough, North Carolina State University

8:00 AM
Evaluating the Effect of Heat Treatment on the Mechanical, Microstructural, Corrosion and Low Temperature Fracture Performances of WAAM Manufactured 2.25Cr-1Mo Type Steel Structure: *Osahon Ehigiator*[1]; Supriyo Ganguly[1]; Filomeno Martina[1]; [1]Cranfield University

8:20 AM
How Do EBM Alloy 718 Builds with Distinct Microstructures Respond to Thermal Post-treatment?: *Sneha Goel*[1]; Johannes Gårdstam[2]; Jonas Olsson[1]; Uta Klement[3]; Shrikant Joshi[1]; [1]University West; [2]Quintus Technologies AB; [3]Chalmers university of technology

8:40 AM
Microstructure and Properties of Additive Laser Powder Bed Fusion Processed and Heat-treated Co-29Cr-5Mo Alloy: *Boateng Twum Donkor*[1]; Jie Song[1]; Michael Kattoura[1]; Seetha Mannava[1]; Vijay Vasudevan[1]; [1]University of Cincinnati

9:00 AM
On Silicon Morphology in Additively Manufactured AlSi10Mg: Effects of Various Post Heat Treatments: Farwan Alghamdi[1]; Amir Hadadzadeh[2]; Babak Shalchi-Amirkhiz[3]; Mohsen Mohammadi[2]; *Meysam Haghshenas*[1]; [1]University of North Dakota; [2]University of New Brunswick; [3]Natural Resources Canada

9:20 AM
Optimizing Microstructure in AM Alloys through the Development of AM-specific Heat Treatments: *Branden Kappes*[1]; Thomas Gallmeyer[1]; Nathan Johnson[1]; Sen Liu[1]; Behnam Aminahmadi[1]; Xiaoli Zhang[1]; Aaron Stebner[1]; [1]Colorado School of Mines

9:40 AM
Post-processing Heat Treatments and Residual Stress Behavior of AlSi10Mg: *Michael Juhasz*[1]; Jared Clark[1]; William Bevin[1]; Jason Walker[1]; Brett Conner[1]; [1]Youngstown State University

10:00 AM Break

10:20 AM
Thermohydrogen Refinement of Microstructure (THRM) as a Post-treatment to Improve Reliability of Additively Manufactured Titanium Alloy Components: *Brady Butler*[1]; James Paramore[1]; Jonathan Ligda[1]; Nathaniel Saenz[1]; Matthew Dunstan[1]; [1]US Army Research Laboratory

10:40 AM
Implementing a Commercially Available Self-locking Screw System in Additively Manufactured Medical Implants: *Ralf Fischer*[1]; Jan Klasen[2]; Bart Prorok[1]; [1]Auburn University; [2]Voxelmed

Additive Manufacturing: Microstructure and Material Properties of Titanium-based Alloys — Electron Beam Powder Bed Fusion

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

Wednesday AM
October 2, 2019

Room: B116
Location: Oregon Convention Center

Session Chair: Ulf Ackelid, Freemelt AB

8:00 AM
Characterization of Additively Manufactured Ti 6Al 4V in Hydrogen: *Paul Korinko*[1]; John Bobbitt[1]; Travis Hubbard[1]; [1]Savannah River National Laboratory

8:20 AM
Crystallographic Texture Evolution in Additively Manufactured Ti-6Al-4V as a Function of Build Height and Scan Strategy: *Alec Saville*[1]; Matt Kenney[2]; Priyanka Agrawal[2]; Sabina Kumar[3]; Jonah Klemm-Toole[1]; Sven Vogel[4]; Sudarsanam Babu[3]; Pete Collins[2]; Amy Clarke[1]; [1]Colorado School of Mines; [2]Iowa State University; [3]University of Tennesee - Knoxville; [4]Los Alamos National Laboratory

8:40 AM
Deformation and Fracture Behavior of Electron Beam Melted Ti-6Al-4V under High Strain Rate Impacts: Reza Alaghmandfard[1]; *Dharmendra Chalasani*[1]; Akindele Odeshi[2]; Mohsen Mohammadi[1]; [1]Marine Additive Manufacturing Centre of Excellence; [2]University of Saskatchewan

9:00 AM
Electron Beam Melted Ti-48Al-2Cr-2Nb Intermetallics: Microstructure, Room- and High-temperature Compression Properties, and High Temperature Creep Properties: *Kee-Ahn Lee*[1]; Young-Kyun Kim[1]; Seong-June Youn[1]; Seong-Woong Kim[2]; Jaekeun Hong[2]; [1]Inha University; [2]Korea Institute of Materials Science

9:20 AM
Factors on Tensile Properties of EBM Fabricated Ti-6Al-4V Alloy: *Yuta Tanaka*[1]; Yutaro Ota[1]; Keiji Kubushiro[2]; [1]IHI Corporation; [2]IHI Asia Pacific (Thailand) Co., Ltd.

9:40 AM
Identifying and Understanding the Influence of Columnar Prior-beta Grain Boundaries on the Tensile and Fatigue Properties of Additively Manufactured Ti-6Al-4V Alloy: *Ma Qian*[1]; [1]RMIT University (Royal Melbourne Institute of Technology)

10:00 AM Break

10:20 AM
Numerical Prediction of Fatigue Life of Additively Manufactured Ti-6Al-4V: *Manisha Banker*[1]; Mannur Sundaresan[1]; Carter Keough[2]; Cynthia Waters[3]; Harvey West[2]; Richard Wysk[2]; Ola Harrysson[2]; [1]North Carolina A&T State University; [2]North Carolina State University; [3]NSWC Carderock Division

10:40 AM
The Role of Microstructural Heterogeneities and as-Built Defects in EBM-PBF Ti-6Al-4V: Mechanical Testing and Characterization at Appropriate Length Scales: *Jake Benzing*[1]; Nik Hrabe[1]; Li-Anne Liew[1]; Enrico Lucon[1]; Ryan White[1]; [1]National Institute of Standards and Technology

11:00 AM
Local Microstructures in Electron Beam Melted Ti-6Al-4V Lattice Primitives with Slender Intersecting Struts: *Sara Messina*[1]; Connie Dong[1]; Toby Francis[1]; Andrew Polonsky[1]; Jean-Charles Stinville[1]; McLean Echlin[1]; Rachel Collino[2]; Matthew Begley[1]; Tresa Pollock[1]; [1]University of California, Santa Barbara; [2]Los Alamos National Laboratory

11:20 AM
Toughness of EBM Additively Manufactured Titanium Alloy Octet Truss Lattice: *Andrew Neils*[1]; Liang Dong[1]; Abbas Moftakhar[2]; Haydn Wadley[1]; [1]University of Virginia; [2]General Electric Additive

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 GL; Arif Mubarok, PPG; Mary Lyn Lim, PPG Industries

Wednesday AM
October 2, 2019

Room: B118
Location: Oregon Convention Center

Session Chairs: Fei Tang, DNV GL USA, Inc.; Evelina Vogli, LM Group Holdings Inc.; Arif Mubarok, PPG

8:00 AM
Influence of Laser Intensity and Speed of Scanning on the Ultimate Tensile Strength and Metallurgical Properties of Laser Cladded Ti-6Al-4V+Ni/Ti-6Al-4V Composite Coating: *Stephen Akinlabi*[1]; Olawale Fatoba[1]; Adedoyin Lasisi[1]; Esther Akinlabi[1]; [1]University of Johannesburg

8:20 AM
Intermetallic TiAl Alloys Properties Enhancement by Thermal Sprayed Heat Resistant Coatings: *Nikolai Zaitsev*[1]; Ivan Mazilin[2]; Anton Artamonov[2]; Mikhail Gorshenkov[1]; Andrei Stepashkin[1]; Vladimir Sudarchikov[1]; Sergey Kaloshkin[1]; Vladislav Zadorozhnyy[1]; [1]NUST MISIS; [2]"TSPC" LLC

8:40 AM Invited
On the Corrosion Resistance of Nitrided and Boronized Nickel-based Alloys: *Virendra Singh*[1]; Manuel Marya[1]; [1]Schlumberger

9:00 AM Invited
Test the Corrosion Effect on High Hard Steel Armor MIL-DTL-46100 Coated with Stellite 6 Applied by Direct Energy Deposition Method: *Ian Toppler*[1]; Claudio Romero[2]; Daniel Schleh[1]; [1]Da Tardec; [2]Chilean Army

9:20 AM
High Performance, Low Friction Amorphous Thermal Sprayed Coatings: *Evelina Vogli*[1]; John Kang[1]; Ricardo Salas[1]; [1]LM Group Holdings Inc.

9:40 AM
Nanoscratch and Electrochemical Behavior of Plasma Sprayed Fe-based Amorphous / Nanocrystalline Coating: *Anil Kumar*[1]; Sapan K. Nayak[1]; Pavan Bijalwan[2]; Atanu Banerjee[2]; Tapas Laha[1]; [1]Indian Institute of Technology, Kharagpur; [2]Research and Development Division, Tata Steel

10:00 AM Break

10:20 AM
Electrochemical Corrosion Behavior of Fe based Amorphous / Nanocrystalline Composite Coating Prepared by High Velocity Oxy-fuel Thermal Spraying: *Sapan K. Nayak*[1]; Anil Kumar[1]; Kuntal Sarkar[2]; Abhishek Pathak[2]; Atanu Banerjee[2]; Tapas Laha[1]; [1]Indian Institute of Technology Kharagpur; [2]Research and Development Division, Tata Steel

10:40 AM
Corrosion Behavior of a $CoCrFeMo_{0.25}Ni_2$ High-entropy Alloy in Laminar Flow CO_2-saturated 3.5 wt.% NaCl: *Alvaro Rodriguez*[1]; Joseph Tylczak[2]; Margaret Ziomek-Moroz[2]; Paul Jablonski[2]; Michael Gao[3]; Kelsea Keenan[4]; [1]ORISE; [2]National Energy Technology Laboratory; [3]Leidos; [4]Mickey Leland Energy Fellowship

11:00 AM
Selective Laser Melting of Ti/SiC Nanocomposite Coating towards Enhanced Surface Performance of Ti64: *Xing Zhang*[1]; Bo Mao[1]; Rebecca Histed[1]; Mohamed Trabia[2]; Brendan O'Toole[2]; Richard Jennings[2]; Pouya Shojaei[2]; Yiliang Liao[1]; [1]University of Nevada, Reno; [2]University of Nevada, Las Vegas

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

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

Wednesday AM
October 2, 2019

Room: D136
Location: Oregon Convention Center

Session Chairs: Ibrahim Karaman, Texas A&M University; Reginald Hamilton, The Pennsylvania State University

8:00 AM
Laser Powder Bed Fusion of Ti-rich TiNi Graded Lattice Structures: Process Optimisation, Geometrical Integrity and Mechanical Property: *Chaolin Tan*[1]; Moataz Attallah[1]; [1]University of Birmingham

8:30 AM
Effects of Heat Treatments on H-phase Growth in Thermo-mechanically Processed NiTiZr: *Jordyn Ward*[1]; Nathan Ley[1]; Robert Wheeler[1]; Brian Van Doren[2]; Marcus Young[1]; [1]University of North Texas; [2]ATI Specialty Alloys and Components

8:50 AM
Directed Energy Deposition of Multilayer Shape Memory Alloy Structures: Titus Reed[1]; Todd Palmer[1]; *Reginald Hamilton*[1]; [1]Pennsylvania State University

9:10 AM
Computational Design of Additively Manufactured Compositionally Graded Alloys: *Tanner Kirk*[1]; Olga Eliseeva[1]; Richard Malak[1]; Raymundo Arroyave[1]; Ibrahim Karaman[1]; [1]Texas A&M University

9:30 AM
Connecting Process Parameters to Grain Structure of Parts Produced by Laser Powder-bed Fusion Additive Manufacturing Using a Monte Carlo Potts Model: *Joseph Pauza*[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

9:50 AM Break

10:10 AM
Investigating SOFC Electrode Microstructures and Performance Degradation: A High Throughput Integrated Model: *William Epting*[1]; Jerry Mason[1]; Yinkai Lei[1]; Paul Ohodnicki[1]; Harry Abernathy[1]; Gregory Hackett[1]; [1]National Energy Technology Laboratory

10:30 AM
Effects of Laser-beam Defocus on Microstructural Features of Compositionally Graded WC/Co Composites Additively Manufactured by Multi-laser Metal Deposition: *Takahiro Kunimine*[1]; Ryusei Miyazaki[1]; Yorihiro Yamashita[2]; Yoshinori Funada[2]; [1]Kanazawa University; [2]Industrial Research Institute of Ishikawa

10:50 AM
Direct Energy Deposition Material Process Validation for Remanufacture, Restoration, and Coating for Ground Vehicle Systems: *Ian Toppler*[1]; Daniel Schleh[1]; [1]DA GVSC

11:10 AM
Processing of Multi-material Composites Using Laser-based Additive Manufacturing: *Kellen Traxel*[1]; Amit Bandyopadhyay[1]; [1]Washington State University

11:30 AM
Design-Processing-Properties of Alternating/Multi-layered, Metal-ceramic Composites Fabricated via Laser-based Additive Manufacturing: *Kellen Traxel*[1]; Amit Bandyopadhyay[1]; [1]Washington State University

Advanced Microelectronic Packaging, Emerging Interconnection Technology, and Pb-free Solder — Environmental Effect and Current Stressing in Advanced Interconnects

Program Organizers: Tae-Kyu Lee, Portland State University; Darrel Frear, Freescale Semiconductor; David Yan, San Jose State University; Albert T. Wu, National Central University

Wednesday AM
October 2, 2019

Room: A108
Location: Oregon Convention Center

Session Chairs: Albert Wu, National Central University; David Yan, San Jose State University

8:00 AM Invited
IMC Evolution as a Function of Grain Orientation under High Current Density in Sn-based Solder Joints: *Fu Guo*[1]; Yu Tian[1]; Yan Wang[1]; Yishu Wang[1]; Limin Ma[1]; [1]Beijing University of Technology

8:30 AM
Predicting Electromigration-mediated Damage in Interconnects Using Phase-field Models: *William Farmer*[1]; Kumar Ankit[1]; [1]Arizona State University

8:50 AM
Micro Interconnect Shear and Creep Performance under Current Stressing: *Mohamed Sheikh*[1]; Scott Fuller[1]; Yeonjin Baek[1]; Tae-Kyu Lee[1]; [1]Portland State University

9:10 AM
Effect of Reducing Agent on the Joint Strength of Sintered-joint with Cu Paste: *Soonyong Kwon*[1]; Yong-Ho Ko[1]; Jeong-Hwan Bang[1]; Hoo-Jeong Lee[2]; Sehoon Yoo[1]; [1]KITECH; [2]Sungkyunkwan University

9:30 AM
Microstructure Evolution in Cu and Ag Coated Cu Particle Sintering for Power Module Interconnection: *Mitchell Flynn*[1]; Chul-Min Oh[2]; Sung-Dae Park[2]; Hyun-Seung Yang[2]; Jeong-Won Yoon[3]; Tae-Kyu Lee[1]; [1]Portland State University; [2]Korea Electronics Technology Institute; [3]Korea Institute of Industrial Technology

9:50 AM Question and Answer Period

10:10 AM Break

10:30 AM Invited
Understanding Reliability Failure Mechanisms in Pb Free Solder Joint with Micro-gap Configuration: *Choong-un Kim*[1]; Yi-Ram Kim[1]; Madanipour[1]; [1]University of Texas at Arlington

11:00 AM
Stretchable Joint with Ag-PDMS for Wearable Electronics: *Junhwan Park*[1]; Kyoung-Ryeol Park[1]; Sungwook Mhin[1]; Young-Bae Park[2]; Sehoon Yoo[1]; [1]KITECH; [2]Andong National University

11:20 AM
Heated Mechanical Cycling as a Substitute for Thermal Cycling - A Preliminary Investigation for a New Failure Analysis Technique: *David Routledge*[1]; Tae-Kyu Lee[2]; [1]Nordson DAGE; [2]Portland State University

11:40 AM
Micro Interconnect Mechanical Stability in Cryogenic Temperature Environment: *Ande Kitamura*[1]; Timothy Mathews[1]; David Routledge[2]; Tae-Kyu Lee[1]; [1]Portland State University; [2]Dage Precision Industries

Advances in Dielectric Materials and Electronic Devices — Ferroics and Multiferroics: Session II

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

Wednesday AM
October 2, 2019

Room: A105
Location: Oregon Convention Center

Session Chairs: Rattikorn Yimnirun, Vidyasirimedhi Institute of Science and Technology; Matjaz Spreitzer, Jozef Stefan Institute

8:00 AM Invited
Superparamagnetic Gallium-substituted Cobalt Ferrite Nanoparticles: Sonja Jovanovic[1]; Marija Vukomanovic[1]; Lea Udovc[1]; Davide Peddis[1]; Matjaž Spreitzer[1]; *Danilo Suvorov*[1]; [1]Jožef Stefan Institute

8:20 AM Invited
Carbon Loads for Electromagnetic Absorption: From Nanoparticles to Fibers: *Ratiba Benzerga*[1]; Chloé Méjean[1]; Mathieu Badard[1]; Ala Sharaiha[1]; [1]University of Rennes, IETR

8:40 AM Invited
Symmetry Modulation and Electric Field-controlled Magnetism in $Bi_{1-x}R_xFeO_3$ Solid Solutions: *Xiang Ming Chen*[1]; [1]Zhejiang University

9:00 AM
$CoFe_2O_4$ - $BaTiO_3$ Magnetoelectric Nanocomposites: Structural, Microstructural and Ferroic Properties: Denise Alanis[1]; Amauri Carvalho Jr[1]; Gustavo Dias[1]; Ivair Santos[1]; Ruyan Guo[2]; Amar Bhalla[2]; *Luiz Cotica*[1]; [1]State University of Maringa; [2]University of Texas at San Antonio

9:20 AM
Development of Multiferroic Devices Utilizing Hybrid 3D Deposition: *Brandon Young*[1]; Bryan Gamboa[1]; Amar Bhalla[1]; Ruyan Guo[1]; [1]University of Texas, San Antonio

9:40 AM Invited
The Novel Structure and Properties in Self-assembled, Topologically Confined BiFeO3 Nano-islands: Ji Ma[1]; Jing Wang[1]; Mingfeng Chen[1]; Renci Peng[1]; *Jing Ma*[1]; Ce-Wen Nan[1]; [1]Tsinghua University

10:00 AM Break

10:20 AM Invited
Advances in Graphene Science and Engineering for Electronic Applications: *David Carey*[1]; [1]University of Surrey

10:40 AM Invited
The Polar Order and Dielectric Anomalies in $Ag(Nb_{1-x}Ta_x)O_3$ Ceramic System: *Matjaz Spreitzer*[1]; Lei Li[2]; Danilo Suvorov[1]; [1]Jozef Stefan Institute; [2]Zhejiang University

11:00 AM
Conduction Mechanisms and Dielectric Properties of $BaBiO_3$ Bulk Ceramics: *Rachel Sherbondy*[1]; Geoff Brennecka[1]; [1]Colorado School of Mines

11:20 AM
Multiferroic Devices on Semiconductors: *Srinivasa Rao Singamaneni*[1]; [1]The University of Texas at El Paso

11:40 AM
Effect of Hafnium Content on Properties of PSZT: Nicholas Anselmo[1]; *Eric Neuman*[1]; Christopher Diantonio[1]; Rose Torres[1]; Tom Chavez[1]; Brian Brane[1]; [1]Sandia National Laboratories

12:00 PM Invited
Strain Induced Enhanced Magnetic Response in Mechanically Processed BiFeO3 Polycrystals: Eduardo Volnistem[1]; Lívia Macková[1]; Luiz Cótica[1]; Gustavo Dias[1]; *Ivair Santos*[1]; [1]State University of Maringá

Advances in Understanding of Martensite in Steels — Design & Modeling

Program Organizers: Ian Zuazo, ArcelorMittal Global R&D - (CRMC, Industeel); Amy Clarke, Colorado School of Mines; Eric Payton, Air Force Research Laboratory; Janelle Wharry, Purdue University; Kester Clarke, Colorado School of Mines; Eric Lass, University of Tennessee, Knoxville; Mohsen Asle Zaeem, Colorado School of Mines

Wednesday AM
October 2, 2019

Room: C125
Location: Oregon Convention Center

Session Chairs: Mohsen Asle Zaeem, Colorado School of Mines; Amy Clarke, Colorado School of Mines

8:30 AM Invited
Flying Martensite: Transformations in Materials Design: *Gregory Olson*[1]; [1]Northwestern University

9:00 AM Invited
Tools for Materials Design of Martensitic Materials: *Annika Borgenstam*[1]; [1]KTH Royal Institute of Technology

9:30 AM
Effect of Tensile Stress on the Kinetics of Isothermal Martensitic Transformation: *Wenqi Mao*[1]; Si Gao[1]; Yu Bai[1]; Myeong-Hoem Park[1]; Akinobu Shibata[1]; Nobuhiro Tsuji[1]; [1]Kyoto University

9:50 AM
Comparison of Transformation Potential Calculations for Two Martensitic Transformation Paths: *Adam Creuziger*[1]; Whitney Poling[1]; Thomas Gnaupel-Herold[1]; [1]National Institute of Standards and Technology

10:10 AM Break

10:30 AM Invited
Martensite and Manufacturing- Alloy Development to Minimize Residual Stress in Large Ferrous Additive Manufactured Parts: *Niyanth Sridharan*[1]; Michael Kottman[2]; Jeff Bunn[1]; Badri Narayanan[2]; Andrzej Nycz[1]; Noakes Mark[1]; Lonnie Love[1]; Ryan Dehoff[1]; [1]Oak Ridge National Laboratory; [2]Lincoln Electric Company

11:00 AM
Effect of Boron on Segregation Behavior on M-A Formation during Continuous Cooling: *Ryo Arao*[1]; Katsuyuki Ichimiya[1]; Yoshiaki Murakami[1]; Naoki Takayama[1]; Koichi Nakashima[1]; Kazukuni Hase[1]; Keiji Ueda[1]; Satoshi Igi[1]; [1]JFE Steel Corporation

11:20 AM
Molybdenum and Niobium Alloying for Property Optimization of Quenched Steels: *Hardy Mohrbacher*[1]; [1]NiobelCon bvba

Alloy Design for Additive Manufacturing: Developing New Feedstock Materials — Development of Alloy Feedstocks

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

Wednesday AM
October 2, 2019

Room: B111
Location: Oregon Convention Center

Session Chairs: Aurelien Perron, Lawrence Livermore National Laboratory; Peter Hosemann, University of California, Berkeley

8:00 AM Introductory Comments

8:05 AM Invited
Alloy Design and Development for AM: Opportunities and Challenges: *Behrang Poorganji*[1]; Mahdi Jamshidinia[1]; Eric Ott[1]; Andrew Wessman[1]; [1]GE Additive

8:35 AM Invited
Microstructures and Meta-structures: Exerting Control Across the Length Scales in Additive Manufacture: *Iain Todd*[1]; [1]University of Sheffield

9:05 AM
Controlling In Situ Reactions during Laser Powder Bed Fusion – A Ti + Mo2C Case Study: *Bey Vrancken*[1]; Sasan Dadbakshsh[2]; Raya Mertens[3]; Kim Vanmeensel[4]; Jef Vleugels[4]; Shoufeng Yang[3]; Jean-Pierre Kruth[3]; [1]Lawrence Livermore National Laboratory; [2]Department of Production Engineering, KTH Royal Institute of Technology; [3]PMA, Department of Mechanical Engineering, KU Leuven, Member of Flanders Make; [4]Department of Materials Engineering, KU Leuven

9:25 AM
Processability and Properties of an Innovative AlSi10Mg+Cu Alloy for Laser Powder Bed Fusion: *Alberta Aversa*[1]; Federico Bosio[1]; Silvia Marola[2]; Dario Gianoglio[2]; Massimo Lorusso[3]; Diego Manfredi[3]; Livio Battezzati[2]; Mariangela Lombardi[1]; [1]Politecnico di Torino, DISAT; [2]Università di Torino; [3]Istituto Italiano di Tecnologia

9:45 AM
Discerning the Impact of Powder Feedstock Variability on Structure, Property and Performance of Selective Laser Melted Alloy 718: David Ellis[1]; *Chantal Sudbrack*[2]; [1]NASA; [2]NASA GRC (Separated)

10:05 AM Break

10:25 AM Invited
The Next Generation of NiTi-based Shape Memory Alloys: Developed for Additive Manufacturing: *Aaron Stebner*[1]; [1]Colorado School of Mines

10:55 AM
Developing Feedstock Powder for Laser Consolidation of Aluminum Metal Matrix Composites: *Ethan Parsons*[1]; [1]MIT Lincoln Laboratory

11:15 AM
Improving the Sintering Behavior of Aluminum Powders by Polydopamine Assisted Introduction of Copper Nanoparticles: *Yao Zhao*[1]; Haoqi Li[1]; Fei Ren[1]; [1]Temple University

11:35 AM
Parametric Study of Melt Pool Dynamics and Microstructure of WE43 Processed by Laser Powder Bed Fusion: *Julie Soderlind*[1]; Nicholas Calta[2]; Jenny Wang[2]; Aiden Martin[2]; Philip Depond[2]; Joerg Loeffler[3]; Subhash Risbud[1]; Manyalibo Matthews[2]; [1]University of California, Davis; [2]Lawrence Livermore National Laboratory; [3]ETH Zurich

Bulk Metallic Glasses and their Composites – Progresses, Outcomes and Prospects — Mechanical Properties

Program Organizers: Muhammad Rafique; Weidong Li, Corning; Junwei Qiao, Taiyuan University of Technology

Wednesday AM
October 2, 2019

Room: E146
Location: Oregon Convention Center

Session Chair: Takeshi Egami, The University of Tennesse - Oak Ridge National Laboratory

8:00 AM Invited
Structure Formation and Property Optimization of Metallic Glasses and Composites: *Jurgen Eckert*[1]; [1]Erich Schmid Institute of Materials Science

8:30 AM Invited
Nanoindentation of Bulk Metallic Glasses – Size Effects: Z.H. Melgarejo[1]; J.E. Jakes[2]; *Donald Stone*[1]; [1]Materials Science and Engineering, University of Wisconsin-Madison; [2]Forest Biopolymer Science and Engineering, USDA Forest Products Laboratory

9:00 AM
Strain Delocalization and Its Dependence on Microstructural Length Scales in Metallic Glass Matrix Composites: *Jason Trelewicz*[1]; [1]Stony Brook University

9:30 AM
Enhancing Ductility of Metallic Glasses by Tuning Nanoscale Structural Heterogeneity: Soohyun Im[1]; Pengyang Zhao[1]; Geun Hee Yoo[2]; Eun Soo Park[2]; Yunzhi Wang[1]; *Jinwoo Hwang*[1]; [1]Ohio State University; [2]Seoul National University

Characterization of Materials and Properties through Metallography, Mechanical Testing and Analysis - From Fundamentals to the Cutting Edge — Quantification, Classification and Simulation of Microstructures and Properties II

Program Organizer: Michael Keeble, Buehler

Wednesday AM
October 2, 2019

Room: F152
Location: Oregon Convention Center

Session Chairs: Andrew Kitahara, Carnegie Mellon University; Janet Gbur, Case Western Reserve University; Steven Gentz, NASA Engineering and Safety Center

8:00 AM Invited
Analysis and Comparison of Microstructure and Mineral Properties of Two Kind of Sinters: Ti-bearing and General Sinter: *Yapeng Zhang*[1]; Wen Pan[1]; Zhe Wang[2]; Shaoguo Chen[1]; Zhixing Zhao[1]; [1]Shougang Group Co., LTD Research Institute of Technology; [2]Shougang Jingtang United Iron & Steel Co., Ltd

8:20 AM
Characterizing Metal Oxide Composites Processed by Internal Oxidation and Severe Plastic Deformation: *Anna Weiss*[1]; Jörg Wiezorek[2]; Yoosuf Picard[1]; Bryan Webler[1]; [1]Carnegie Mellon University; [2]University of Pittsburgh

8:40 AM
Surface Analysis of Film Formed by Egg Shell Extract on Stainless Steel in Acid Solution: Omotayo Sanni[1]; API Popoola[1]; *OSI Fayomi*[1]; [1]Tshwane University of Technology

9:00 AM
Investigation of Thermal Diffusivity for the First Generation Graphitic White Iron: Jie Wan[1]; Jingjing Qing[2]; *Mingzhi Xu*[2]; [1]Missouri University of Science and Technology; [2]Georgia Southern University

9:20 AM
Investigation of Wear Performance for the First Generation Graphitic White Iron: *Jie Wan*[1]; Jingjing Qing[2]; Mingzhi Xu[2]; [1]Missouri University of Science and Technology; [2]Georgia Southern University

9:40 AM
Observation of Nanotwin and Ni_2Si Discontinuous Precipitation in Cold-drawn Cu-Ni-Si Alloy: *Hwangsun Kim*[1]; Jee Hyuk Ahn[1]; Seung Zeon Han[2]; Janghyun Jo[1]; Miyoung Kim[1]; Heung Nam Han[1]; [1]Seoul National University; [2]Korea Institute of Materials Science

10:00 AM Break

10:20 AM
Classification of Steel Microstructures – Tracing Bainite with the Help of Textural Parameters: *Martin Mueller*[1]; Frank Mücklich[2]; Dominik Britz[2]; Thorsten Staudt[3]; [1]Saarland University; [2]Universität des Saarlandes; [3]AG der Dillinger Hüttenwerke

10:40 AM
Pearlite Spheroidization and Its Relationship with Tensile Strength: *Monserrat Lopez*[1]; Hector Vergara-Hernández[1]; Pedro Garnica-González[1]; Octavio Vázquez-Gómez[1]; Sixtos Arreola-Villa[2]; [1]Instituto Tecnologico de Morelia; [2]Universidad Autónoma de Coahuila

11:00 AM
Effect of Process Parameters on the Porosity of Al-7%Si Alloy Castings Produced by Ceramic Shell Investment Casting Process: Balwinder Singh[1]; *Pargeet Chauhan*[2]; [1]GZS Campus CET Bathinda; [2]Freudenberg NOK Pvt Ltd Mohali

11:20 AM
Development of an Orthogonal Metal Cutting Experiment to Investigate Microstructural Evolution in Friction Stir Welding: *Benjamin Lund*[1]; [1]University of Alabama in Huntsville

11:40 AM
Phase Fraction Development of Ni2Cr from Isothermal Ageing Conditions: *Nicholas Aerne*[1]; Julie Tucker[1]; [1]Oregon State University

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

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

Wednesday AM
October 2, 2019

Room: D134
Location: Oregon Convention Center

Session Chairs: Edward Gorzkowski, Naval Research Laboratory; Jian Shi, Rensselaer Polytechnic Institute

8:00 AM Invited
Electroactive Materials for Divalent Ion Rechargeable Batteries: *Guozhong Cao*[1]; [1]University of Washington

8:30 AM
Elaboration of Solid Nano-structured Electrolytes of Ce0.85-xGd0.15MxO2-ä (x = 0.03, 0.05 and M = Sm and La) and Measurement of Ionic Conductivity at Intermediate Temperatures: Karla María Rangel-Arreola[1]; *Ena Athenea Aguilar-Reyes*[1]; Carlos Alberto León-Patiño[1]; [1]Universidad Michoacana de San Nicolas de Hidalgo

8:50 AM
An All Zirconia Ceramic Solid Oxide Fuel Cell with Improved Power Generation: *John Drazin*[1]; Dustin McLarty[1]; [1]Washington State University

9:10 AM
Thermal Conductivity Reduction in 7 wt% Yttria Doped Zirconia Nanocrystalline Ceramics: John Drazin[1]; James Wollmershauser[2]; Stephanie Wimmer[2]; Brian Donovan[3]; *Edward Gorzkowski*[2]; [1]Washington State University; [2]Naval Research Laboratory; [3]United States Naval Academy

9:30 AM
Topochemical Conversion of Different Shaped BaTiO3 and Its Effect on Boosting Electrical Properties of Composite Materials: *Jing Fu*[1]; Haiyan Zhao[1]; Mupeng Zheng[1]; Mankang Zhu[1]; Yudong Hou[1]; [1]Beijing University of Technology

9:50 AM Invited
Perovskite-based Functional Nanocomposites for Highly Stable and Efficient Hybrid Solar Cells: *Yoon-Bong Hahn*[1]; [1]Chonbuk National University

10:20 AM Break

10:40 AM
Scalable Electrospinning of CsH2PO4 Micro- and Nanometer Fibers for Solid Acid Fuel Cell Applications: *Ryan McCarty*[1]; Konstantinos Giapis[2]; Fernando Diaz Campos[3]; Mandy Abbott[3]; Calum Chisholm[3]; [1]University of California, Irvine; [2]California Institute of Technology; [3]SAFCell

11:00 AM
Light-matter Interactions in Nanocrystalline Ceramics Near the Mie Scattering Limit: James Wollmershauser[1]; Serge Nakhmanson[2]; John Drazin[3]; Boris Feigelson[1]; Lukasz Kuna[2]; *Edward Gorzkowski*[1]; [1]Naval Research Laboratory; [2]University of Connecticut; [3]Washington State University

11:20 AM
Shape Evolution of CdSe/CdS Dot-in-Rods into Multi-tiered Pyramidal Nanocrystals: Growth Mechanisms and Optical Properties: *Natalie Gogotsi*[1]; Aditya Maan[1]; Christopher Murray[1]; [1]University of Pennsylvania

Corrosion of Additively Manufactured Metals — Corrosion of Additively Manufactured Metals I

Program Organizers: Eric Schindelholz; Rajeev Gupta, The University of Akron; Ajit Mishra, Haynes International; Amit Pandey, Ansys/Granta Design

Wednesday AM
October 2, 2019

Room: B112
Location: Oregon Convention Center

Session Chairs: Eric Schindelholz, Sandia National Laboratories; Rajeev Gupta, University of Akron

8:00 AM
Corrosion of Additively Manufactured Stainless Steels – Process, Structure, and Performance: *Michael Melia*[1]; Eric Schindelholz[1]; Jeffrey Rodelas[1]; [1]Sandia National Laboratories

8:20 AM
Issues in Localized Corrosion of Selective Laser Melted 316L: *Duane Armell Macatangay*[1]; Robert Kelly[1]; Alex Chmielinski[1]; [1]University of Virginia

8:40 AM
Improved Electrochemical Response of SLM 316L SS in Physiological Solutions: *Nahid Sultan Al-Mamun*[1]; Ishraq Shabib[1]; [1]Central Michigan University

9:00 AM
Effect of Chloride and Heat Treatment on Pitting Corrosion Resistance and Mechanical Properties of a 316L Stainless Steel Manufactured by the Direct Metal Laser Sintering (DMLS) Process: *Claudia Prieto*[1]; David Young[1]; Marc Singer[1]; [1]Ohio University

9:20 AM Invited
Surface Preparation of Additively Manufactured Metals and Subsequent Comparison of Corrosion Characteristics: *Daniel Hooks*[1]; Randall Edwards[1]; Jamie Stull[1]; D. Allen Gresham[1]; Donald Johnson[1]; Enkeleda Dervishi[1]; [1]Los Alamos National Laboratory

9:40 AM
Effect of Surface Finish on the Corrosion Properties of Additively Manufactured Stainless Steel: *Jamie Stull*[1]; Courtney Clark[1]; Daniel Hooks[1]; Randy Edwards[1]; Enkeleda Dervishi[1]; Don Johnson[1]; Allen Gresham[1]; [1]Los Alamos National Laboratory

10:00 AM Break

10:20 AM
Corrosion Behavior of Additive Manufactured 316L and Alloy 625: *Michael Bestic*[1]; Xiaoli (Shelly) Tang[1]; Robert Bianco[1]; [1]Swagelok Company

10:40 AM
Hydrogen Concentration and Uptake in Additively Manufactured Austenitic Stainless Steels: *Rebecca Schaller*[1]; Amin Imani[1]; Edouard Asselin[1]; Eric Schindelholz[2]; [1]University of British Columbia; [2]Sandia National Laboratories

11:00 AM
Evaluation of the Corrosion Response of Additively-Manufactured 17-4 PH Stainless Steel Samples as a Function of Build and Finish Parameters: *Michael Roach*[1]; Joseph Thomas[1]; Karl Nelson[2]; Rod McMillan[2]; [1]Biomedical Materials Science Department, University of Mississippi Medical Center; [2]3D Printing Center of Excellence, Johnson and Johnson

11:20 AM Invited
Understanding the Influence of Retained Nitrogen in Additively-manufactured 17-4 Stainless Steel: Does it Really Improve Corrosion Resistance?: *Mark Stoudt*[1]; Richard Ricker[1]; [1]National Institute of Standards and Technology

11:40 AM
Corrosion of Additive Materials for Naval Applications: *Pin Lu*[1]; Marie Thomas[1]; Abhinav Saboo[1]; Dana Frankel[1]; Greg Olson[1]; [1]Questek Innovations Llc

Crosscutting Issues in Corrosion of Materials: Control, Monitoring, Mitigation and Material Selection — Cross-cutting Applications of Steel and Its Corrosion Protection

Program Organizers: Matthew Asmussen, Pacific Northwestern National Laboratory; Jeff Binns, Nuclear Waste Management Organization; James Neeway, Pacific Northwest National Laboratory; John Zhang, Gamry Instruments; Mary Lyn Lim, PPG; Sudhakar Mahajanam, Pinnacle ART; Eric Schindelholz, Sandia National Laboratories; Ajit Mishra, Haynes International; James Noel, Western University; Guang-Ling Song, Xiamen University; David Shoesmith, Western University; Raul Rebak, General Electric Global Research

Wednesday AM
October 2, 2019

Room: B119
Location: Oregon Convention Center

Session Chairs: James Neeway, Pacific Northwest National Laboratory; Xueyuan Zhang, Gamry Instruments

8:00 AM
Effect of NaNO2 in Corrosion Inhibition of Micro-alloyed Steel in E20 and E40 Simulated Fuel Grade Ethanol Environment: *Olufunmilayo Joseph*[1]; Seetharaman Sivaprasad[2]; Raghuvir Singh[2]; [1]Covenant University; [2]CSIR-NML

8:20 AM
An Electrolytic Cell Used in a Simulated High Pressure Corrosive Deep Sea Environment: *Yuqing Xu*[1]; Guangling Song[1]; [1]Xiamen University

8:40 AM Invited
Corrosion Studies of the Copper-coated Canadian Used Fuel Container: *Wilfred Binns*[1]; Mehran Behazin[1]; Peter Keech[1]; [1]Nuclear Waste Management Organization

9:20 AM
The Complex History of Rb Influenced Steel Corrosion: *Matthew Asmussen*[1]; James Neeway[1]; Charles Demarest[2]; John Scully[2]; [1]Pacific Northwestern National Laboratory; [2]University of Virginia

9:40 AM
Corrosion of Coated Tinplate Cans Used for Food Storage: *Kuo-Hsiang Chang*[1]; G. S. Frankel[1]; [1]Ohio State University

10:00 AM Break

10:15 AM
An Investigation of Cast Iron Corrosion Behavior in Chloride Containing Engine Coolant Environment: *Gaurav Argade*[1]; Anusha Chilukuri[1]; Justin Perry[1]; Corey Trobaugh[1]; Randy Schafer[1]; Erica Raisor[1]; Jacob Steenhoek[1]; Glenia Pena Lugo[1]; [1]Cummins Inc.

10:35 AM
Steel Corrosion Resistance in the Technological Process: Valerii Mishchenko[1]; Natalia Evseeva[2]; *Sergey Shejko*[1]; Vadim Shalomeev[2]; [1]Zaporizhzhya National University; [2]Zaporizhzhya National Technical University

10:55 AM
Evaluation of Palm Kernel Oil as Green Inhibitor for Protection of Mild Steel in Acidic and Alkaline Media: Muideen Bodude[1]; Ruth Nnaji[1]; Wasiu Ayoola[1]; Abdulrasaq Adeleke[1]; *Ademola Agbeleye*[1]; [1]University of Lagos

Emergent Materials under Extremes and Decisive In-situ Characterizations — Pressure-induced Dramatic Changes in Structures and Properties I

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

Wednesday AM
October 2, 2019
Room: E145
Location: Oregon Convention Center

Session Chairs: BingBing Liu, Jilin University; Xujie Lu, Center for High Pressure Science & Technology Advanced Research

8:30 AM Invited
Emerging Materials from Pressure Induced Electronic Transition: *Wenge Yang*[1]; [1]HPSTAR

9:00 AM Invited
High-pressure Chemistry: Novel Compounds and Bond Schemes: *Alexander Goncharov*[1]; [1]Geophysical Laboratory, Carnegie

9:30 AM
Superconductivity in Amorphous Sb2Se3: *Kai Zhang*[1]; Wenge Yang[2]; [1]The University of Chicago; [2]HPSTAR

9:50 AM Invited
Novel Superhard sp3 Carbon Allotrope from Cold-Compressed C70 Peapods: *Liu Bingbing*[1]; [1]Jilin University

10:20 AM Break

10:40 AM Invited
Structural Behavior and Phase Relations of β-Eucryptite at High P-T Conditions: *Hongwu Xu*[1]; [1]Los Alamos National Laboratory

11:10 AM Panel Discussion

Failure Analysis: Industry Specific Failures — Agricultural, Forestry & Logging Failures

Program Organizers: Andrew Havics, PH2 LLC; James Lane, Rimkus Consulting Group Inc; Burak Akyuz, Applied Technical Services Inc; Pierre Dupont, UMONS, Faculté Polytechnique de MONS (FPMs)

Wednesday AM
October 2, 2019
Room: F151
Location: Oregon Convention Center

Session Chairs: Amber Dalley, Consultant; David Riegner, SEA Limited; Adam Boesenberg, Iowa State University; Jake Auliff, Danfoss Power Solutions

8:00 AM Invited
Adhesive-wood Interactions in Relation to Failure in Bonded Wood Products from Centimeter to Nanometer Scale: *Charles Frihart*[1]; Nayomi Plaza[1]; Christopher Hunt[1]; Joseph Jakes[1]; [1]Forest Products Laboratory

8:40 AM
Case Studies in Failure Analysis of Tinplate Containers for Food Packaging: *Francisco Rumiche*[1]; Carlos Juarez[1]; [1]Pontificia Universidad Catolica Del Peru

9:00 AM
Failure of Beet Planter Support Wheel Kingpins: *Keith Cline*[1]; [1]ESI

9:20 AM Invited
Failure Analysis of a Combine Wheel Motor: *Adam Boesenberg*[1]; [1]Iowa State University

9:50 AM
When a Butterfly Flaps Its Wings: Failure Analysis of a Hydrostatic Axial Piston Pump Control Module Component: *Jake Auliff*[1]; [1]Danfoss Power Solutions Company

Failure Prevention and Unconventional Failures — Unusual & Unconventional Failures & Failure Analysis

Program Organizers: Andrew Havics, PH2 LLC; James Lane, Rimkus Consulting Group Inc; Burak Akyuz, Applied Technical Services Inc; Pierre Dupont, UMONS, Faculté Polytechnique de MONS (FPMs)

Wednesday AM
October 2, 2019
Room: F149
Location: Oregon Convention Center

Session Chairs: Joseph Lemberg, Exponent; Conrad Park, Case Western Reserve University; Erik Mueller, National Transportation Safety Board; Craig Schroeder, Element

8:00 AM Invited
When a Highway Bridge Suddenly Lifts Its Up Without Prior Announcement … !: *Pierre Dupont*[1]; [1]UMONS, Faculté Polytechnique de MONS (FPMs)

8:20 AM
As Designed Does Not Always Equal as Manufactured: *Charles White*[1]; [1]Kettering University

8:40 AM
Common Failures, Uncommon Features: *Erhan Ulvan*[1]; [1]Acuren Group Inc.

9:00 AM Invited
The Power of the "Infinite Smalls" Where Heavy Rude Working Conditions Are Involved!: *Pierre Dupont*[1]; [1]UMONS, Faculté Polytechnique de MONS (FPMs)

9:20 AM
Wind-induced Failure of 9m Street Lamp Poles: *Milo Kral*[1]; [1]University of Canterbury

9:40 AM Invited
Failure Analysis of a LORAN C Tower Near Greenland: *George Vander Voort*[1]; [1]Vander Voort Consulting L.L.C.

10:00 AM Break

10:20 AM
Failure by Design: *Andrew Havics*[1]; [1]PH2 LLC

10:40 AM
Metallurgical Failure Analysis of a Fractured Intermediate Coupling: *Craig Schroeder*[1]; [1]Element

11:00 AM
Leak in Water Line 45 Years in the Making: *Thomas Traubert*[1]; [1]EDT Engineers

11:20 AM
The Unusual Case of a Not-so-Obvious Brake Line Failure: *Erik Mueller*[1]; Stephen Stein[1]; [1]National Transportation Safety Board

11:40 AM
Investigation of an Amphibious Duck-boat Fracture in Seattle, WA: *Adrienne Lamm*[1]; [1]National Transportation Safety Board

Formability and Fracture of Metal Sheets — Formability and Fracture of Metal Sheets II

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

Wednesday AM
October 2, 2019

Room: C123
Location: Oregon Convention Center

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

8:00 AM Invited
Mechanical Behavior of Ni and Cr added Bainite/ Martensite Multiphase Steels: *Hongwei Ma*

8:30 AM
Study of GP-zone/MgZn2 Precipitation Coupled with Deformation in Al-Zn-Mg-Cu to Overcome the Strength-ductility Paradox: *Tarang Mungole*[1]; Aashish Rohatgi[1]; [1]Pacific Northwest National Laboratory

8:50 AM
Deformation Mode Effects on Austenite Stability of Quenched-and-Partitioned Steel Measured via X-ray Diffraction and Electron Backscattered Diffraction: *Jun Hu*[1]; Ana Araujo[1]; Kavesary Raghavan[1]; Grant Thomas[1]; [1]AK Steel Research and Innovation Center

9:10 AM
Mitigation of Edge Cracking during Accumulative Roll Bonding of Aluminum Alloys: *Brady McBride*[1]; Kester Clarke[1]; Amy Clarke[1]; [1]Colorado School of Mines

9:30 AM
Anisotropic and Time-dependent Continuum Damage Coupled Plasticity Model for Predicting Ductile Fracture of AA 6xxx: *Mustapha Makki*[1]; Georges Ayoub[1]; Jackie Ayoub[1]; Andrey Linich[2]; George Luckey[2]; Ghassan Kridli[1]; [1]University of Michigan - Dearborn; [2]Ford Motor Company

9:50 AM
Distortional Anisotropic Hardening Model for Describing Complex Bauschinger and Transient Effects in Metal Forming Simulations: *Myoung-Gyu Lee*[1]; Hongjin Choi[1]; Jinwoo Lee[2]; Hyukjong Bong[2]; Kwang Seon Shin[1]; [1]Seoul National University; [2]Korea Institute of Materials Science

Glasses, Optical Materials, and Devices: Current Issues in Science & Technology — Glass-environment Interactions

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

Wednesday AM
October 2, 2019

Room: A106
Location: Oregon Convention Center

Session Chairs: John Vienna, PNNL; Jincheng Du, University of North Texas; Nicholas Smith, Corning Inc.

8:00 AM Invited
Commonalities in Corrosion Mechanisms across Materials: *Joseph Ryan*[1]; [1]Pacific Northwest National Laboratory

8:40 AM Invited
What Does "Chemical Durability" Mean to a Glass Industry and Current Challenges?: *Aize Li*[1]; [1]Corning Inc.

9:10 AM Invited
Nuclear Waste Glass Composition Control for Predictable Chemical Durability: *John Vienna*[1]; [1]Pacific Northwest National Laboratory

9:40 AM
Interactions between Modifier Identity, Network Connectivity, and Solution pH in Corrosion of Aluminosilicate Glasses: *Nicholas Smith*[1]; Robert Schaut[1]; Jonathan Icenhower[1]; Elzbieta Bakowska[1]; Adama Tandia[1]; [1]Corning Incorporated

10:00 AM Break

10:20 AM Invited
Understanding Water-silicate Glass Interactions from Reactive Potential Based Simulations: *Jincheng Du*[1]; [1]University of North Texas

10:50 AM Invited
Water Affects the Properties of Silica and the Silica Surface Affects the Properties of Water: Atomistic Mechanisms: Jesse Lentz[1]; *Stephen Garofalini*[1]; [1]Rutgers University

11:20 AM
Molar Volume of SiOH Estimated from Swelling Strains: *Sheldon Wiederhorn*[1]; Karl Schell[2]; Theo Fett[2]; [1]National Institute of Standards and Technology; [2]Karlsruhe Institute of Technology(KIT)

Global Young Investigators Forum — Global Young Investigator's Forum: Session I

Program Organizers: Kathleen Shugart Cissel, UES Inc; Victoria Christensen, University of California Santa Barbara

Wednesday AM
October 2, 2019

Room: A109
Location: Oregon Convention Center

Session Chairs: Kathleen Cissel, MacAulay Brown Inc.; Victoria Christensen, University of California, Santa Barbara; Ashley Hilmas, University of Michigan; Brian Gilmore, Pioneer Natural Resources

8:00 AM Invited
Statistical Mechanical Modeling of Topological Fluctuations and the Adaptability of Glass-forming Systems: *Katelyn Kirchner*[1]; John Mauro[1]; [1]Pennsylvania State University

8:30 AM
Microstructure and Thermoelectric Properties of Sr0.9La0.1TiO3 Ceramics with Nano-sized Metal Particles as Additive: *Mengjie Qin*[1]; [1]Northwestern Polytechnical University

8:50 AM
Probing the Influence of Defects on the Fundamental Mechanical Properties of Titanium Carbide MXenes via Atomistic Simulations: *Gabriel Plummer*[1]; Babak Anasori[2]; Yury Gogotsi[2]; Garritt Tucker[1]; [1]Colorado School of Mines; [2]Drexel University

9:10 AM
Rapid Laser Reactive Sintering of Ceramics for 3D Printing of Protonic Ceramic Energy Devices: *Shenglong Mu*[1]; Zeyu Zhao[1]; Hua Huang[1]; Minda Zou[1]; Jincheng Lei[1]; Yuzhe Hong[1]; Kyle Brinkman[1]; Fei Peng[1]; Hai Xiao[1]; Jianhua Tong[1]; [1]Clemson University

9:30AM
Pair Distribution Function Computed Tomography to Investigate the Local Atomic Structure of Carbonated Alkali-activated Slag Paste: *Eric McCaslin*[1]; Claire White[1]; [1]Princeton University

9:50 AM
Additive Manufacturing of Ceramics for Electrochemical Oxidative Coupling of Methane: *Shanti Kiran Nayak*[1]; Angelica Benavidez[1]; Lok-kun Tsui[1]; Fernando Garzon[1]; [1]University of New Mexico

Grain Boundaries, Interfaces, and Surfaces in Functional Materials: Fundamental Structure-Property-Performance Relationships — Characterization of Interface Properties

Program Organizers: Ming Tang, Rice University; Shen Dillon, University of Illinois, Urbana-Champaign; John Blendell, Purdue University; Wayne Kaplan, Technion - Israel Institute of Technology

Wednesday AM
October 2, 2019

Room: E143
Location: Oregon Convention Center

Session Chairs: Chris Marvel, Lehigh University; Shen Dillon, University of Illinois, Urbana-Champaign

8:00 AM Keynote
Measurements of Grain Boundary Energy and Curvature from the Three Dimensional Structure of Polycrystals: *Gregory Rohrer*[1]; [1]Carnegie Mellon University

8:40 AM
Ultrahigh Temperature In Situ Micromechanics for Probing Interfacial Properties of Oxides: *Shen Dillon*[1]; [1]University of Illinois

9:00 AM
Quantitative Characterization of Grain Growth in Polycrystalline Nickel Using Three-dimensional X-ray Microscopy: *Aditi Bhattacharya*[1]; Yu-Feng Shen[1]; Gregory S. Rohrer[1]; Robert M. Suter[1]; Christopher M. Hefferan[2]; Shiu Fai Frankie Li[3]; Jonathan Lind[3]; [1]Carnegie Mellon University; [2]RJ Lee Group; [3]Lawrence Livermore National Laboratory

9:20 AM
Grain Boundary Chemistry Effects on Local Stress Relaxation.: *Prasad Soman*[1]; Erik Herbert[1]; Stephen Hackney[1]; [1]Michigan Technological University

9:40 AM
Observations of Multiple Grain Boundary Complexions in Eu-doped Boron Suboxide: *Christopher Marvel*[1]; Kristopher Behler[2]; Jerry LaSalvia[3]; Martin Harmer[1]; [1]Lehigh University; [2]U.S. Army Research Laboratory; SURVICE Engineering; [3]U.S. Army Research Laboratory

10:10 AM Break

10:30 AM
Liquid Metal Interactions with Dislocations: Liquid-Metal-Mediated Recrystallization and Other Puzzling Phenomena: Justin Norkett[1]; Alec Chu[1]; Kit Manchette[1]; Courtney Wiley[1]; *Victoria Miller*[2]; [1]North Carolina State University; [2]University of Florida

10:50 AM
Characterization of ã-alumina and Pt/ ã-alumina Interfaces Using Transmission Electron Microscopy and Density Functional Theory: *Arielle Clauser*[1]; Kofi Oware Sarfo[1]; Al Rise[1]; Colin Ophus[2]; Raquel Giulian[3]; Líney Árnadóttir[1]; Melissa Santala[1]; [1]Oregon State University; [2]National Center for Electron Microscopy; [3]Universidade Federal do Rio Grande do Sul

11:10 AM
Ba Transport in Scandate Cathodes: Evaporation, Adsorption Surface Transport at Operating Temperature: *Mujan Seif*[1]; Kerry Baker[1]; Huanhuan Bai[1]; Thomas Balk[1]; Matthew Beck[1]; [1]University of Kentucky

Hybrid Organic-Inorganic Materials for Alternative Energy — Energy Storage

Program Organizers: Andrei Jitianu, Lehman College, City University of New York; Lisa Klein, Rutgers University; Lia Stanciu, Purdue University; Mihaela Jitianu, William Paterson University

Wednesday AM
October 2, 2019

Room: E147
Location: Oregon Convention Center

Session Chair: Masahide Takahashi, Osaka Prefecture University

8:00 AM Invited
Fabrication and Characterization of Metal Oxide Based Hybrid Materials for High Power Energy Storage: *Chun-Han (Matt) Lai*[1]; Christopher Choi[1]; Danielle Butts[1]; Bruce Dunn[1]; [1]University of California, Los Angeles

8:30 AM Invited
Facile Fabrication of Fe Oxide Negative Electrode for Fe-air Battery Application: *Wai Kian Tan*[1]; Kenta Asami[1]; Go Kawamura[1]; Hiroyuki Muto[1]; Atsunori Matsuda[1]; [1]Toyohashi University of Technology

9:00 AM Invited
Probing Interfacial Reactions in Energy Storage and Conversion Devices Using Synchrotron X-ray Techniques: *Zhenxing Feng*[1]; [1]Oregon State University

9:30 AM Invited
Metal-organic Frameworks for Electrochemical Energy Storage Applications: *Min Kyu Song*[1]; [1]Washington State University

10:00 AM Break

10:10 AM Invited
Functional Organic-inorganic Hybrids and Inorganic Nanostructures Generated by Infiltration Synthesis: *Chang-Yong Nam*[1]; [1]Brookhaven National Laboratory

10:40 AM
Theoretical Modelling of Hydrogen Storage in Graphene-based Electrode Material in a Novel Proton Battery: *Michael Ling*[1]; John Andrews[2]; Saeed Seif Mohammadi[2]; [1]DST Group; [2]RMIT University

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

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

Wednesday AM
October 2, 2019

Room: G132
Location: Oregon Convention Center

Session Chairs: M Arul Kumar, Los Alamos National Laboratory; Philip Eisenlohr, Michigan State University

8:00 AM Invited
ICME at the Mesoscale: Computational and Experimental Challenges and Opportunity: Stephen Niezgoda[1]; Pengyang Zhao[1]; Yunzhi Wang[1]; *Michael Mills*[1]; Connor Slone[1]; Supriyo Chakraborty[1]; [1]Ohio State University

8:30 AM Invited
Micromechanics – Crystal Plasticity Links for Deformation Twinning: *Yubraj Paudel*[1]; Christopher Barrett[1]; Haitham El Kadiri[1]; [1]Mississippi State University

9:00 AM
Multiscale Modeling of the Elasto-plastic Behavior of Architectured and Nanostructured Cu-Nb Composite Wires and Comparison with Neutron Diffraction Experiments: *Tang Gu*[1]; David McDowell[1]; [1]Georgia Institute of Technology

9:20 AM
Investigating Active Slip Planes in Tantalum using Single Crystal Experiments and Simulations: *Hojun Lim*[1]; Jay Carroll[1]; Joseph Michael[1]; Corbett Battaile[1]; Matthew Lane[1]; [1]Sandia National Laboratories

9:40 AM
Mechanical Properties of Single Crystal Niobium from Uniaxial Deformation Experiments and Crystal Plasticity Modeling: *Eureka Pai Kulyadi*[1]; Jean-Francois Croteau[2]; Philip Eisenlohr[1]; Chaitanya Kale[3]; Kiran Solanki[3]; Thomas Bieler[1]; Di Kang[1]; [1]Michigan State University; [2]I-Cube Research ; [3]Arizona State University

10:00 AM Break

10:20 AM Invited
Comparison between Experiments and Modeling for Slip Transfer Across Grain Boundaries: *Thomas Bieler*[1]; Harsha Phukan[1]; Yang Su[1]; Chelsea Edge[1]; Sarra Haouala[2]; Martin Crimp[1]; Philip Eisenlohr[1]; Carl Boehlert[1]; Javier Seguardo[2]; Jonathan Molina[2]; Javier LLorca[2]; Marcos Peña-Ortega[3]; Reza Alizadeh[2]; [1]Michigan State University; [2]IMDEA Materiales; [3]Universidad Polytechnica Madrid

10:50 AM Invited
More than Crystal Plasticity: Multiphysics in DAMASK: *Philip Eisenlohr*[1]; Aritra Chakraborty[1]; Pratheek Shanthraj[2]; Martin Diehl[3]; Darren Pagan[4]; Thomas Bieler[1]; [1]Michigan State University; [2]University of Manchester; [3]Max-Planck-Institut für Eisenforschung GmbH; [4]Cornell University

11:20 AM
In-situ Mapping of Spatially Resolved Stress Fields Associated with Twinning in Bulk HCP Crystals: *M Arul Kumar*[1]; Laurent Capolungo[1]; Rodney McCabe[1]; Wenjun Liu[2]; Jon Tischler[2]; Carlos Tome[1]; [1]Los Alamos National Laboratory; [2]Argonne National Laboratory

11:40 AM
Modeling of Two-phase Polycrystals using a Gradient Crystal Plasticity Theory Including Dissipative Hardening and Energetic Micro-stress: *Paul Christodoulou*[1]; Avery Samuel[1]; Ricardo Lebensohn[2]; Frank Zok[1]; Irene Beyerlein[1]; [1]University of California, Santa Barbara; [2]Los Alamos National Laboratory

International Symposium on Ceramic Matrix Composites — CMC I

Program Organizers: Narottam Bansal, National Aeronautics and Space Administration; Jacques Lamon, LMT-Cachan, CNRS; Sung Choi, Naval Air Systems Command; J. P. Singh, US Army Research Laboratory (Retired)

Wednesday AM
October 2, 2019

Room: A103
Location: Oregon Convention Center

Session Chairs: Randall Hay, AFRL; Sung Choi, NAVAIR

8:20 AM Invited
Environmental Durability/Reliability of Ceramic Matrix Composites (CMCs): D. Calvin Faucett[1]; Sean Kane[1]; Ashlynn Stanley[1]; Brandon Thomas[1]; *Sung Choi*[1]; [1]Naval Air Systems Command

9:00 AM Invited
Environmental Effects on Ceramic Fibers: *Randall Hay*[1]; [1]USAF

9:40 AM
Characterization and Modeling of SiC Fiber and SiC Matrix Ceramic Tubular Composites: *Ghatu Subhash*[1]; James Nancce[1]; Hemanth Thandaga[1]; Bhavani Sankar[1]; Raphael Haftka[1]; [1]University of Florida

10:00 AM Break

10:20 AM Invited
Application of Machine Learning for Reliability Assessment of Advanced Ceramic Matrix Composites: Naohiro Shichijo[1]; *Yutaka Kagawa*[1]; [1]Tokyo University of Technology

11:00 AM
Deep Learning CT Image Segmentation for High Throughput Quantitative Analysis of SiC-SiC Ceramic Matrix Composites: *Aly Badran*[1]; Mike Marsh[2]; David Marshall[1]; Nicolas Piche[3]; Zacharie Legault[3]; Benjamin Provencher[3]; Ruslana Makovetsky[2]; [1]University of Colordo Boulder; [2]Object Research Systems; [3]Polytechnique Montreal

11:20 AM
Life Limiting Behavior of Ceramic Matrix Composites (CMCs) under Cyclic Interlaminar Shear Loading at Elevated Temperatures: *Sean Kane*[1]; Ashlynn Stanley[1]; Brandon Thomas[1]; David Faucett[1]; Sung Choi[1]; [1]NAVAIR

11:40 AM
Rebounding Velocity of Projectiles in Ceramic Matrix Composites (CMCs) Subjected to Foreign Object Damage (FOD): *David Faucett*[1]; Ashlynn Stanley[1]; Sean Kane[1]; Sung Choi[1]; [1]NAVAIR

Joining of Advanced and Specialty Materials XXI — Micro and Nano-Joining / Steel Welding I

Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee; Hiroaki Mori, Osaka University; Yuri Hovanski, Brigham Young University; Darren Barborak, WeldQC Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell; Zhenzhen Yu, Colorado School of Mines

Wednesday AM
October 2, 2019

Room: Portland Ballroom 252
Location: Oregon Convention Center

Session Chairs: Anming Hu, University of Tennessee; Hiroaki Mori, Osaka University; Peng He, Harbin Insitute of Technology; Zhiyong Gu, University of Massachusetts Lowell

8:00 AM Invited
Reactive and Non-reactive Nanomultilayers for Advanced Joining Applications: *Lars P.H. Jeurgens*[1]; Bastian Rheingans[1]; Luchan Lin[1]; Sebastian Siol[1]; Claudia Cancellieri[1]; Jolanta Janczak-Rusch[1]; [1]Empa

8:30 AM Invited
Fabricate of Nanomaterials using Microreactor-assisted Printing for Joining: *Chih-Hung Chang*[1]; Brian Paul[1]; [1]Oregon State University

9:00 AM Invited
Laser Direct-writing of Copper Electrodes and Sensors on Flexible Substrate: *Peng Peng*[1]; [1]Beihang University

9:20 AM
Laser Welding of Te Nanowires for Single Nanowire Field Effect Transistor: *Anming Hu*[1]; Yongchao Yu[1]; [1]University of Tennessee

9:40 AM
Magnetic-assisted Assembly and IR Soldering of Multi-segmented Nanowires for Nanodevices: *Jirui Wang*[1]; Chefu Su[1]; Hongwei Sun[1]; Zhiyong Gu[1]; [1]University of Massachusetts Lowell

10:00 AM
Nickel Nanoparticles for Boron-free and Silicon-free Nano-transient Liquid Phase Bonding of Inconel 718: *Anming Hu*[1]; Denzel Bridges[1]; Raymond Xu[2]; [1]University of Tennessee Knoxville; [2]Rolls-Royce

10:20 AM Break

10:35 AM Invited
Impact Welding of Wrought vs. Additively Manufactured Ultra-high-strength Stainless Steel: *Bert Liu*[1]; Anthony Palazotto[1]; Anupam Vivek[1]; Glenn Daehn[1]; [1]Air Force Institute of Technology

11:05 AM
Austenite Transformation in Duplex Stainless Steels under Fast Cooling Rates: Lilia Luengas[1]; Eduardo Morales[2]; Luis Felipe Souza[3]; *Ivani Bott*[1]; [1]Puc-Rio; [2]Central University of Las Villas; [3]CEFET-RJ

11:25 AM
Influence of the Process Parameters on the Transformation Behaviour of 2205 Duplex Stainless Steel during Laser Beam Welding: Stefan Ulrich[1]; *Felix Gemse*[1]; Peter Schaaf[2]; Simon Jahn[1]; [1]ifw - Günter-Köhler-Institut für Fügetechnik und Werkstoffprüfung GmbH; [2]TU Ilmenau, Institute of Materials Science and Engineering

11:45 AM
Effect of Weld Designs on Steel and Ductile Iron Laser Weld Properties: *Huaxin Li*[1]; [1]General Motors

12:05 PM
Study of Variation in Mechanical Properties from Welding Low Density Fe-Mn-Al-C Steel for Armor Applications: *Rishi Kant*[1]; John DuPont[1]; [1]Lehigh University

Journal of the American Ceramic Society Awards Symposium — JACerS Award Symposium Session I

Program Organizer: William Fahrenholtz, Missouri University of Science and Technology

Wednesday AM
October 2, 2019

Room: A107
Location: Oregon Convention Center

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

8:00 AM Introductory Comments Bill Fahrenholtz

8:10 AM Invited
Creep and Relaxation of Cement Paste Caused by Stress-induced Dissolution of Hydrated Solid Components: *Zachary Grasley*[1]; Xiaodan Li[2]; Jeffrey Bullard[3]; Pan Feng[4]; [1]Texas A&M University; [2]Oklahoma State University; [3]NIST; [4]Southeast University

8:40 AM Invited
Titanate Based Glass-ceramics for Zctinide Immobilization: *Yingjie Zhang*[1]; Linggen Kong[1]; Tao Wei[1]; Inna Karatchevtseva[1]; Zhaoming Zhang[1]; Daniel Gregg[1]; [1]Australian Nuclear Science & Technology Organisation

9:10 AM Invited
Increased UV Absorption of Natural Hydroxyapatite–based Sunscreen through Laser Ablation in Liquid: Clara Piccirillo[1]; Mónica Fernández-Arias[2]; Mohamed Boutinguiza[2]; David Tobaldi[3]; Jesús del Val[2]; Maria Pintado[4]; *Juan Pou*[2]; [1]Institute of Nanotechnology, CNR NANOTEC; [2]University of Vigo; [3]CICECO. University of Aveiro; [4]Escola Superior de Biotecnologia. Universidade Católica Portuguesa.

9:40 AM Invited
Conductivity of Iron-doped Strontium Titanate in the Quenched and Degraded States: *Elizabeth Dickey*[1]; Daniel Long[1]; Jonathon Baker[1]; Preston Boyes[1]; Douglas Irving[1]; [1]North Carolina State University

10:10 AM Break

10:30 AM Invited
Microstructure-conductivity Relationship of $Na_3Zr_2Si_2PO_{12}$: *Sahir Naqash*[1]; Frank Tietz[1]; Doris Sebold[1]; Olivier Guillon[1]; [1]Forshungszentrum Juelich

11:00 AM Invited
High-performance Energy Harvesting Piezoceramics with High Depolarization Temperature: *Haiyan Zhao*[1]; Jing Fu[1]; Mupeng Zheng[1]; Mankang Zhu[1]; Yudong Hou[1]; [1]Beijing University of Technology

11:30 AM Invited
Polar Domain Structural Evolution under Electric Field and Temperature in the (Bi0.5Na0.5)TiO3–0.06BaTiO3 Piezoceramics: *Nan Zhang*[1]; Jinyan Zhao[1]; Wei Ren[1]; Gang Niu[1]; Lingyan Wang[1]; Zuo-Guang Ye[2]; [1]Xi'an Jiaotong University; [2]Simon Fraser University

Light Metal Technology — Magnesium Technology

Program Organizers: Xiaoming Wang, Purdue University; Alan Luo, Ohio State University; Kumar Sadayappan, Canmet MATERIALS

Wednesday AM
October 2, 2019

Room: D138
Location: Oregon Convention Center

Session Chair: Alan Luo, Ohio State University

8:00 AM Invited
Shear Assisted Processing and Extrusion (ShAPE): Tim Skszek[1]; *Scott Whalen*[2]; [1]Magna International Inc.; [2]Pacific Northwest Laboratory

8:20 AM
A Study of Improvement of Mechanical Properties of Magnesium Alloys through Rolling Confinement: *Pavitra Krishnan*[1]; Zhigang Xu[2]; Sergey Yarmolenko[2]; Jagannathan Sankar[2]; Laszlo Kecskes[3]; Qiuming Wei[1]; [1]University of North Carolina Charlotte; [2]N.C. A&T State University; [3]HEMI, Johns Hopkins University

8:40 AM
Ultra-high Strain Rate Processing of Magnesium Alloys: Microstructure Evolution and Enhanced Mechanical Properties: *Bo Mao*[1]; Yiliang Liao[1]; Bin Li[1]; [1]University of Nevada, Reno

9:00 AM
Development Strategies of Next Generation Magnesium Alloy Sheets: *Dietmar Letzig*[1]; Jose Victoria-Hernandez[1]; Jan Bohlen[1]; Gerrit Kurz[1]; Sangbong Yi[1]; [1]Magnesium Innovation Centre (MagIC), Helmholtz-Zentrum Geesthacht

9:20 AM
Effect of Alloying Element on Deformation Behavior of Binary Magnesium Alloys: *Jihyun Hwang*[1]; Byeong-Chan Suh[2]; Jae H. Kim[1]; Byeong-Joo Lee[1]; H. S. Kim[3]; Nack J. Kim[1]; [1]Pohang University of Science and Engineering; [2]Korea Institute of Materials Science

9:40 AM
Improving the Tribological Performance of Magnesium Alloys by Laser Shock Peening: *Bo Mao*[1]; Arpith Siddaiah[1]; Xing Zhang[1]; Bin Li[1]; Pradeep Menezes[1]; Yiliang Liao[1]; [1]University of Nevada, Reno

10:00 AM Break

10:20 AM
Grain Refinement of Magnesium Cast Alloys: *Norbert Hort*[1]; Sihang You[1]; Jiang Gu[1]; Yuanding Huang[1]; [1]Helmholtz-Zentrum Geesthacht

10:40 AM Invited
Production of High-quality Aircraft Magnesium Alloys Castings Using Carbon-containing Materials: Vadim Shalomeev[1]; Valeriy Naumik[1]; *Nikita Aikin*[1]; Sergei Sheyko[2]; [1]Zaporozhye National Technical University; [2]Zaporizhzhia National University

11:00 AM Invited
Understanding the Mechanical Properties of Mg Alloys: A Multi-scale Study: *Zongrui Pei*[1]; [1]National Energy Technology Laboratory

11:20 AM Invited
Novel Al-Ti-C and Al-C Grain Refinement of AZ91D Mg Alloys: Tyler Davis[1]; Lukas Bichler[1]; *Kristian Mackowiak*[1]; [1]University of British Columbia - Okanagan Campus

Materials for Nuclear Applications — Carbide and Advanced Reactor Materials

Program Organizers: Philip Edmondson, Oak Ridge National Laboratory; Yutai Katoh, Oak Ridge National Laboratory; Jake Amoroso, Savannah River National Laboratory; Levi Gardner, University of Utah; Amy Gandy, University of Sheffield; Karl Whittle, University of Liverpool; Monica Ferraris, Politecnico di Torino

Wednesday AM
October 2, 2019

Room: E148
Location: Oregon Convention Center

Session Chair: Xunxiang Hu, Oak Ridge National Laboratory

8:00 AM Invited
Exploring TRISO Layer Properties and Performance for Multiple Reactor Concepts: *Rachel Seibert*[1]; Tyler Gerczak[1]; [1]Oak Ridge National Laboratory

8:40 AM
Computational Studies of Environmental Degradation of Silicon Carbide: *Izabela Szlufarska*[1]; Jianqi Xi[1]; Cheng Liu[1]; [1]University of Wisconsin - Madison

9:00 AM
Unveiling SiC/SiC CMC Cladding Failure Mechanisms and Hermetic Performance with In-situ 3D-Digital Image Correlation: *Clifton Bumgardner*[1]; Frederick Heim[1]; Xiaodong Li[1]; [1]University of Virginia

9:20 AM
High-entropy Carbide Ceramics for Extreme Environments: Fei Wang[1]; Xueliang Yan[1]; Yongfeng Lu[1]; Michael Nastasi[1]; *Bai Cui*[1]; [1]University of Nebraska Lincoln

9:40 AM
Temperature Impacts on Damage Response in Mixed Carbides: *Karl Whittle*[1]; Glyn Cobourne[1]; Philip Edmondson[2]; [1]University of Liverpool; [2]Oak Ridge National Laboratory

10:00 AM Break

10:20 AM Invited
Development and Performance of High Temperature Irradiation Resistant Thermocouples: *Brian Jaques*[1]; Richard Skifton[2]; Lan Li[1]; Beck Perrine[1]; Scott Riley[1]; Ember Sikorski[1]; [1]Boise State University; [2]Idaho National Laboratory

11:00 AM
Thermophysical Properties of Binary Cl & F Compositions for Next Generation Molten Salt Reactors: *Jason Lonergan*[1]; Dallas Reilly[1]; Sayandev Chatterjee[1]; Bruce McNamara[1]; [1]Pacific Northwest National Laboratory

11:20 AM
Using ACRT with MVB Furnace to Achieve Low-cost CZT: *Seth McPherson*[1]; Saketh Kakkireni[1]; Jedidiah McCoy[1]; Santosh Swain[1]; Kelvin Lynn[1]; [1]Washington State University

Nanostructured Materials under Extreme Environments — Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanostructured Materials II

Program Organizers: Jin Li, Purdue University; Assel Aitkaliyeva, University of Florida; Youxing Chen, University of North Carolina at Charlotte; Yue Liu, Shanghai Jiao Tong University; Shuai Shao, Louisiana State University

Wednesday AM
October 2, 2019

Room: D133
Location: Oregon Convention Center

Session Chairs: Yue Liu, Shanghai JiaoTong University; Shuai Shao, Louisiana State University

8:00 AM Invited
The Elusive Toughness of Nanocrystalline Alloys: *Brad Boyce*[1]; Nathan Heckman[1]; Khalid Hattar[1]; Christopher Barr[1]; Fadi Abdeljawad[2]; Stephen Foiles[1]; [1]Sandia National Laboratories; [2]Clemson University

8:30 AM Invited
On Scratching Behavior of Ceramic/Metal Nanolaminates: *Iman Salehinia*[1]; Mesbah Uddin[1]; Aaron McKeown[1]; Michael Zawadzki[1]; [1]Northern Illinois University

9:00 AM
Compressive Behavior of Accumulative Roll Bonded Mg/Al Alloys under Confinement: *Pavitra Krishnan*[1]; Zhigang Xu[2]; Sergey Yarmolenko[2]; Jagannathan Sankar[2]; Laszlo Kecskes[3]; Qiuming Wei[1]; [1]University of North Carolina Charlotte; [2]NC A&T University; [3]HEMI, Johns Hopkins University

9:20 AM Invited
High Throughput Nanoindentation - Microstructure Correlation at Elevated Temperatures: *Eric Hintsala*[1]; Youxing Chen[2]; Jacob Noble[1]; Jordan Weaver[3]; Bartosz Nowakowski[1]; Douglas Stauffer[1]; Nathan Mara[4]; [1]Bruker Nano Surfaces; [2]University of North Carolina Charlotte; [3]National Institute of Standards and Technology; [4]University of Minnesota

9:50 AM Invited
Interface-dominated Plasticity in Metallic Nanostructured Materials: *Jiangwei Wang*[1]; Qi Zhu[1]; Guang Cao[1]; Siyuan Wei[1]; [1]Zhejiang University

10:10 AM Break

10:30 AM Invited
Study of Pseudomorphically Transformed bcc Mg in Mg/Nb Multilayer Nanocomposites under Extreme Conditions of Pressure, Temperature and High Strain Rates: Manish Jain[1]; Irene Beyerlein[2]; Marko Knezevic[3]; Nenad Velisavljevic[4]; Nathan Mara[5]; Johann Michler[6]; *Siddhartha Pathak*[1]; [1]University of Nevada, Reno; [2]University of California, Santa Barbara; [3]University of New Hampshire; [4]Los Alamos National Laboratory; [5]University of Minnesota, Minneapolis; [6]Empa, Swiss Federal Laboratories for Materials Science and Technology

11:00 AM Invited
The Correlation between the Irradiation Microstructure and Nanoindentation Properties of the Advanced Stainless Steel D9: *Tianyi Chen*[1]; Lingfeng He[2]; Mack Cullison[1]; Jatuporn Burns[3]; Yaqiao Wu[3]; Lizhen Tan[4]; [1]Oregon State University; [2]Idaho National Laboratory; [3]Biose State University; [4]Oak Ridge National Laboratory

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

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

Wednesday AM
October 2, 2019

Room: C126
Location: Oregon Convention Center

Session Chairs: Hang Yu, Virginia Polytechnic Institute and State University; Gary Pickrell, Virginia Tech; Navin Manjooran, Solve Technology and Research, Inc.

8:00 AM Keynote
Solid-state Additive Manufacturing of Metal Matrix Nanocomposites Using Additive Friction Stir Deposition: *Hang Yu*[1]; [1]Virginia Tech

8:40 AM
Electrical Properties of Samarium Substituted Cobalt Nano- ferrites for Energy Applications: *Ravinder Dachepalli*[1]; [1]Osmania University

9:00 AM
Fabrication of a Helium Ion Machined Nanochannel Device: *Kate Klein*[1]; Lindsey Barner[2]; James McLaurin[1]; Javel Wilson[1]; Andras Vladar[3]; [1]University of the District of Columbia; [2]University of Washington; [3]National Institutie of Standards and Technology

9:20 AM
Electrochemical and Structural Study of 10GDC Electrolyte for SOFC Applications at Intermediate Temperature via Conventional Sintering: *Shabana Parvin Shaikh*[1]; [1]SP Pune University

9:40 AM
Elucidating the Power of Nanoinclusion and Porous Site Scattering Mechanisms in Enhancing Thermoelectric ZT: *Seyed Aria Hosseini*[1]; Jackson Harter[2]; Devin Coleman[1]; Lorenzo Mangolini[1]; Todd Palmer[2]; Alex Greaney[1]; [1]University of California, Riverside; [2]Oregon State University

10:00 AM Break

10:20 AM
Green Synthesis of Functionalized Nanoresins for Effective and Sustainable Water Purification: *Abhispa Sahu*[1]; Jordan C. Poler[1]; [1]University of North Carolina, Charlotte

10:40 AM Concluding Comments

Next Generation Biomaterials — Next Generation Biomaterials IV

Program Organizers: Roger Narayan, University of North Carolina; Federico Rosei, INRS Centre for Energy, Materials and Telecommunications

Wednesday AM
October 2, 2019

Room: C122
Location: Oregon Convention Center

Session Chairs: Tanveer Tabish, University of Exeter; Annabel Braem, KU Leuven; Xanthippi Chatzistavrou, Michigan State University

8:00 AM Invited
Additively Manufactured 316L Stainless Steel for Biomedical Applications: *Waseem Haider*[1]; Jahangir Khan Lodhi[1]; [1]Central Michigan University

8:20 AM Invited
Anti-infective Strategies for Next Generation Dental Implants: *Annabel Braem*[1]; [1]KU Leuven Department of Materials Engineering

8:40 AM Invited
Hierarchical Hybrid Carbon Nano-structures as Tissue Engineering Scaffolds: Understanding Cell-scaffold Interaction: *Soham Parikh*[1]; Wenhu Wang[1]; Luping Huang[1]; Debra Mayes[1]; Sharmila Mukhopadhyay[1]; [1]Wright State University

9:00 AM Invited
New Insights in Calcium Phosphate Biomineralization Unraveled by Real Time Nanoscale LTEM: *Tolou Shokuhfar*[1]; [1]University of Illinois at Chicago

9:20 AM
Novel Hot-warm Rolled Zn-0.8Li Alloy with Superior Mechanical Properties and Ideal Degradation Rate for Biomedical Stents: *Luning Wang*[1]; [1]University of Science and Technology Beijing

9:40 AM Invited
Sol-gel Derived Glass-ceramic with Advanced Antibacterial and Bioactive Properties: *Xanthippi Chatzistavrou*[1]; Natalia Pajares; Adam Marsh[1]; Logan Soule[1]; Nathan Mellott[1]; Neal Hammer[1]; Kurt Hankenson[1]; [1]Michigan State University

10:00 AM Break

10:20 AM Invited
Biopolymer-derived Triboelectric Devices for Self-powered Human-integrated Sensors and Interfaces: *Wenzhuo Wu*[1]; [1]Purdue University

10:40 AM
Multidimensional Analysis on Bioabsorbable Zn-Ag-based Alloys for Stent Applications: *Ehsan Mostaed*[1]; Malgorzata Sikora-Jasinska[1]; Morteza Shaker Ardakani[1]; Ali Mostaed[1]; Jaroslaw Drelich[1]; [1]Michigan Technological University

11:00 AM Invited
Optically Monitored Photothermia within the Biological Windows: Plasmonic Heating and Luminescent Nanothermometry: *Marta Quintanilla*[1]; I. García[2]; I. de Lázaro[3]; S. Vranic[3]; M. Henriksen-Lacey[2]; A. Sánchez-Iglesias[2]; K. Kostarelos[3]; L.M. Liz-Marzán[2]; [1]Bionanoplasmonics Laboratory, CIC biomaGUNE and CIBER-BBN/Universidad Autónoma de Madrid; [2]Bionanoplasmonics Laboratory, CIC biomaGUNE and CIBER-BBN; [3]NanomedicineLab, The University of Manchester

11:20 AM Invited
Graphene Nanostructures as Cancer Theranostic Probes: A Positive Rescue for Negative Margins: *Tanveer Tabish*[1]; [1]University of Exeter

11:40 AM Invited
Synthesis, Characterization and Solubility Analysis of Amorphous SiO2-CaONa2O-P2O5 Scaffolds for Hard Tissue Repair: S. Chon[1]; L. Piraino[1]; Sahar Mokhtari[1]; E.A. Krull[1]; A. Coughlan[1]; Y. Gong[1]; Nathan Mellott[1]; Timothy Keenan[1]; *Anthony Wren*[1]; [1]Alfred University

Phase Transformations in Ceramics: Science and Applications — Experimental Studies on Structure and Control II

Program Organizers: Pankaj Sarin, Oklahoma State University; Waltraud Kriven, University of Illinois at Urbana-Champaign; Sanjay Khare, University of Toledo; Yu Zhong, Worcester Polytechnic Institute

Wednesday AM
October 2, 2019
Room: A104
Location: Oregon Convention Center

Session Chair: Pankaj Sarin, Oklahoma State University

8:00 AM Invited
Precipitation in Metal-ceramic Systems under Reducing Conditions: *Ivar Reimanis*[1]; Dylan Jennings[1]; [1]Colorado School of Mines

8:30 AM
In-situ Observations of Phase Transformations on Individual Particles of a Cu/Fe Oxygen Carrier during High-temperature Oxidation and Reduction Cycles: *William Nealley*[1]; Anna Nakano[2]; Jinichiro Nakano[2]; Melissa Santala[3]; James Bennett[4]; [1]National Energy Technology Laboratory - U.S. Department of Energy, Oak Ridge Institute for Science and Education, Oregon State University; [2]National Energy Technology Laboratory - U.S. Department of Energy, Leidos Research Support Team; [3]Oregon State University; [4]National Energy Technology Laboratory - U.S. Department of Energy

8:50 AM
Thermal Expansion and Phase Transformation Mechanism in the Lanthanide Di-titanate System: *Benjamin Hulbert*[1]; Kuo-Pin Tseng[1]; Scott McCormack[1]; Waltraud Kriven[1]; [1]University of Illinois, Urbana-Champaign

9:10 AM
Ferroelectric Phase Transition in Tungsten Trioxide Gas Sensors: *Owen Abe*[1]; Perena Gouma[1]; [1]The Ohio State University

9:30 AM Invited
Phase Transitions in Hollandite Oxides with Nanoscale Chemical Ordering: *Scott Misture*[1]; Robert Koch[1]; Jake Amoroso[2]; Kyle Brinkman[3]; Mingyang Zhao[3]; [1]Alfred University; [2]Savannah River National Laboratory; [3]Clemson University

10:00 AM Break

10:20 AM
Phase Transformations in High-entropy, Lanthanide Oxides: *Kuo-Pin Tseng*[1]; Waltraud Kriven[1]; Ming-Hung Tsai[2]; [1]University of Illinois Urbana Champaign; [2]National Chung Hsing University, Taiwan

10:40 AM
Changes to the Local Environment during the Entropic Phase Transformation in High Entropy Oxides: *Alexander Dupuy*[1]; Elke Arenholz[2]; I-Ting Chiu[3]; Padraic Shafer[2]; Yayoi Takamura[3]; Julie Schoenung[1]; [1]University of California, Irvine; [2]Lawrence Berkeley National Laboratory; [3]University of California, Davis

11:00 AM Invited
Pseudo-single Crystal Growth of Cobalt Dititanate, an Entropy Stabilized Compound: Kevin Anderson[1]; Anit Giri[2]; Richard Vinci[1]; *Helen Chan*[1]; [1]Lehigh University; [2]Army Research Laboratory

Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals — Powder Metallurgy of Titanium, Aluminium, Magnesium and Calcium I

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

Wednesday AM
October 2, 2019
Room: D135
Location: Oregon Convention Center

Session Chairs: James Paramore, U.S. Army Research Laboratory; Gang Chen, University of Science and Technology Beijing

8:00 AM Invited
Deformation Behavior and Microstructural Evolution of Hydrogen-sintered Ti-6Al-4V during Hot Compression Tests: Austin Mann[1]; *Pei Sun*[2]; Omar Kergaye[2]; Wyatt McNeill[2]; Ali Yousefiani[1]; Z. Zak Fang[2]; [1]The Boeing Company; [2]University of Utah

8:30 AM Keynote
Advances in Titanium Research & Technology in Australia: *Stefan Gulizia*[1]; Leon Prentice[1]; [1]CSIRO Manufacturing

9:10 AM Invited
Analysis of Grain Boundary a Phase in Hydrogen Sintered Powder Metallurgy Ti-6Al-4V: *Matthew Dunstan*[1]; James Paramore[1]; Brady Butler[1]; Z. Zak Fang[2]; Jonathan Ligda[1]; [1]US Army Research Laboratory; [2]University of Utah

9:40 AM
Low Temperature Sintering of Ti6Al4V as a Promising Route to Design Titanium based Composites: *Jenniffer Bustillos*[1]; Cheng Zhang[1]; Pranjal Nautiyal[1]; Archana Loganathan[1]; Xiaolong Lu[2]; Benjamin Boesl[1]; Arvind Agarwal[1]; [1]Florida International University; [2]Soochow University

10:00 AM Break

10:20 AM Invited
Mechanical Properties of HIP'd HSPT Sintered Ti-6Al-4V: *Wyatt McNeill*[1]; Pei Sun[1]; Omar Kergaye[1]; Zak Fang[1]; James Paramore[1]; Matt Dunstan[1]; [1]University of Utah

10:50 AM Invited
Design and Fabrication of Strong and Ductile (tensile) Powder Metallurgy Titanium Metal Matrix Composites: *Ma Qian*[1]; Shudong Luo[1]; Tingting Song[1]; Bing Liu[2]; [1]Royal Melbourne Institute of Technology; [2]Chongqing University of Arts and Sciences

11:20 AM Invited
Gas Atomization Processing of Calcium Powder with In situ Passivation: *Iver Anderson*[1]; Charles Czahor[1]; Dustin Hickman[1]; Trevor Riedemann[1]; [1]Iowa State University / Ames Laboratory

PSDK XIV: Phase Stability and Diffusion Kinetics — Diffusion and Kinetics

Program Organizers: Michael Gao, National Energy Technology Laboratory; Hans Seifert, Karlsruhe Institute of Technology; Zi-Kui Liu, Pennsylvania State University; Fan Zhang, CompuTherm LLC; Richard Otis, Jet Propulsion Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory

Wednesday AM
October 2, 2019

Room: E144
Location: Oregon Convention Center

Session Chairs: Dane Morgan, University of Wisconsin-Madison; Yongho Sohn, University of Central Florida

8:00 AM
Experimental Determination of Quinary Interdiffusion Coefficients in Fe-Ni-Co-Cr-Mn System: *Vivek Verma*[1]; Kaustubh Kulkarni[1]; [1]Indian Institute of Technology Kanpur

8:20 AM
Closed Form Solution for the Analysis of Compact Interdiffusion Couples: *Irina Belova*[1]; Mohammad Afikuzaman[1]; Tanvir Ahmed[1]; Graeme Murch[1]; [1]University of Newcastle

8:40 AM
Grain Boundary Chemistry and Transport in Nanocrystalline Alloys: Insight from Diffusion Triples: Pralav Shetty[1]; Francisco Andrade Chavez[2]; *Jessica Krogstad*[2]; [1]Georgia Institute of Technology; [2]University of Illinois at Urbana-Champaign

9:00 AM
A New and Exact Formalism for Describing Diffusion of Solid Binary Alloys in a Temperature Gradient: Irina Belova[1]; Zi-Kui Liu[2]; *Graeme Murch*[1]; [1]University of Newcastle; [2]Pennsylvania State University

9:20 AM Invited
Phase Reversion Kinetics of Thermally Decomposed (a + γ') Phases to γ -phase in U – 10 wt.% Mo Alloy: Ryan Newell[1]; Abhishek Mehta[1]; Youngjoo Park[1]; Dennis Keiser[2]; *Yongho Sohn*[1]; [1]University of Central Florida; [2]Idaho National Laboratory

9:40 AM
Pushing Direct Experimental Measurement of Crystallization Kinetics in Phase Change Materials using Multiple Microscopic Techniques: Christopher Barr[1]; Victoriea Bird[2]; Geoffrey Campbell[3]; Khalid Hattar[1]; Isak McGieson[2]; Anthony Monterrosa[1]; Bryan Reed[4]; Al Rise[2]; Shalini Tripathi[5]; *Melissa Santala*[2]; [1]Sandia National Laboratories; [2]Oregon State University; [3]Lawrence Livermore National Laboratory; [4]Integrated Dynamic Electron Solutions Inc.; [5]University of Connecticut

10:00 AM Break

10:20 AM
A Kinetic Model for Interaction of Iron (II) Oxide with Pure Alumina Refractory under Flash Ironmaking Conditions: *Rahul Sarkar*[1]; Hong Yong Sohn[1]; [1]University of Utah

10:40 AM
Composition-dependent Precipitation Kinetics in Fe-Mn-Al-C Alloys: *Krista Limmer*[1]; Daniel Field[1]; Laura Bartlett[2]; Katherine Sebeck[3]; [1]CCDC Army Research Laboratory; [2]Missouri S&T; [3]CCDC Ground Vehicle Systems Center

11:00 AM
Optimization of Mobility Parameters based on the Relationship to Composition Profiles: *Kil-Won Moon*[1]; Maureen Williams[1]; Carelyn Campbell[1]; [1]National Institute of Standards & Technology

11:20 AM Invited
High-throughput Ab Initio and Machine Learning for Diffusivity Databases: *Dane Morgan*[1]; Haijin Lu[1]; Ryan Jacobs[1]; Henry Wu[1]; [1]University of Wisconsin - Madison

Sintering and Related Powder Processing Science and Technologies — Characterization of Sintering

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

Wednesday AM
October 2, 2019

Room: E142
Location: Oregon Convention Center

Session Chairs: Zachary Cordero, Rice University; Jin Li, Purdue University

8:00 AM Invited
Glass Sealing of Solid Oxide Fuel Cells (SOFC): Benjamin Ehreiser[1]; *Michael J. Hoffmann*[1]; [1]Karlsruhe Institute for Technology (KIT)

8:30 AM Invited
Microstructural Control during Sintering of WC-Co: *Paul Prichard*[1]; [1]Kennametal Inc

9:00 AM
Simultaneous Multiple Complex Net Shape Components Production by 3D Printing and Spark-Plasma Sintering: *Eugene Olevsky*[1]; Elisa Torresani[1]; Geuntak Lee[1]; Charles Maniere[1]; [1]San Diego State University

9:20 AM
Influence of Grain Size on the Entropic Transformation in High Entropy Oxides: *Alexander Dupuy*[1]; Xin Wang[1]; Julie Schoenung[1]; [1]University of California, Irvine

9:40 AM
Sintering Behavior and Ionic Conductivity of $Li_{1.5}Al_{0.5}Ti_{1.5}(PO_4)_3$ Synthesized with Different Precursors: *Alexandra von der Heiden*[1]; Bambar Davaasuren[1]; Frank Tietz[2]; [1]Forschungszentrum Juelich GmbH; [2]Helmholtz-Institute Münster

10:00 AM Break

10:20 AM
Reactive Sintering and Templated Grain Growth of CuO-doped PIN-PMN-PT Ceramics: *Beecher Watson*[1]; Michael Brova[1]; Scott Misture[2]; Mark Fanton[1]; Richard Meyer[1]; Gary Messing[1]; [1]Pennsylvania State University; [2]Alfred University

10:40 AM
In-situ Monitoring of Interfaces Being Formed as a Functon of Pressure, Temperature and Composition: *Thomas Rudzik*[1]; Rosario Gerhardt[1]; [1]Georgia Institute of Technology

11:00 AM
In-situ Observation of the Internal Structure of an Alumina Green Body during Sintering by Optical Coherence Tomography: *Junichi Tatami*[1]; Fumika Sakamoto[1]; Takuma Takahashi[2]; Motoyuki Iijima[1]; [1]Yokohama National University; [2]Kanagawa Institute of Industrial Science and Technology

11:20 AM
3D Multiscale-imaging of Processing-induced Defects Formed during Sintering of Alumina: *Gaku Okuma*[1]; Shuhei Watanabe[1]; Kan Shinobe[1]; Norimasa Nishiyama[1]; Fumihiro Wakai[1]; Akihisa Takeuchi[2]; Kentaro Uesugi[2]; Satoshi Tanaka[3]; [1]Tokyo Institute of Technology; [2]Japan Synchrotron Radiation Research Institute; [3]Nagaoka University of Technology

11:40 AM
Visualization of Sintering in Particle-based Ink Printed Ni Scaffolds via In Situ X-ray Tomography: Safa Khodabakhsh[1]; *Ashley Paz y Puente*[1]; [1]University of Cincinnati

Surface Properties of Biomaterials — Composite Biomaterials

Program Organizers: Ryan Bock, SINTX Technologies; Jason Langhorn, DePuy Synthes Joint Reconstruction; Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University; Mangal Roy, Indian Institute of Technology-Kharagpur; Venu Varanasi, University of Texas at Arlington

Wednesday AM
October 2, 2019

Room: C121
Location: Oregon Convention Center

Session Chair: Jason Langhorn, DePuy Synthes Joint Reconstruction

8:00 AM Invited
Multiferroic Particle Reinforced Injectable Bone Cement: In Vitro Bone Cell Differentiation and Mineralization: Chandra Khatua[1]; Somoshree Sengupta[1]; Biswanath Kundu[1]; Dipten Bhattacharya[1]; *Vamsi Balla*[2]; [1]CSIR-Central Glass & Ceramic Research Institute; [2]University of Louisville

8:40 AM Invited
Bioactive Silicon Nitride Dental Implant: *Wei Xia*[1]; Håkan Engqvist[1]; [1]Uppsala University

9:00 AM
PEO/Sol-gel Composite Coating on a Mg-based Alloy Towards Degradation-controlled Orthopedic Implants: *Hamdy Ibrahim*[1]; David Dean[2]; Alan Luo[2]; Rigoberto Advincula[3]; Mohammad Elahinia[4]; [1]University of Tennessee, Chattanooga; [2]The Ohio State University; [3]Case Western Reserve University; [4]The University of Toledo

9:20 AM
Effects of Sr Doping on Biodegradation and Bone Regeneration of Magnesium Phosphate Bioceramics: *Kaushik Sarkar*[1]; Vinod Kumar[2]; Samit Nandi[2]; Mangal Roy[1]; [1]Indian Institute of Technology; [2]West Bengal University of Animal & Fishery Sciences

9:40 AM
In Vitro Corrosion and Cytocompatibility behaviour of Bioactive Glass Reinforced Magnesium Composite Fabricated by Hot Press Sintering: *Sourav Dutta*[1]; Sanjay Gupta[1]; Mangal Roy[1]; [1]Indian Institute of Technology Kharagpur

10:00 AM
Soy Isoflavones Incorporated 3D Printed Bone Scaffolds with In Vitro Chemopreventive, Osteogenic and In Vivo Anti-Inflammatory Activity: *Naboneeta Sarkar*[1]; Susmita Bose[1]; [1]Washington State University

Surface Protection for Enhanced Materials Performance: Science, Technology, and Application — Thermal Barrier Coatings / Ceramic Coatings Formed by Aerosol Deposition I

Program Organizers: Kang Lee, NASA Glenn Research Center; Jun Song, McGill University; Yutaka Kagawa, University of Tokyo; 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; Stephen Yue, McGill University; Richard Chromik, McGill University

Wednesday AM
October 2, 2019

Room: D137
Location: Oregon Convention Center

Session Chairs: Daniel Mumm, University of California, Irvine; Kang Lee, NASA Glenn Research Center; Edward Gorzkowski, Naval Research Laboratory

8:00 AM Invited
Extreme Heat Shielding, Flame Resistance and Anti-corrosion Behavior of Clay-based Nanocoatings: *Jaime Grunlan*[1]; [1]Texas A&M University

8:30 AM Invited
Failure of Zirconia Thermal Barrier Coatings on Planar and Cylindrical Geometries: *Edward Gildersleeve*[1]; Sanjay Sampath[1]; [1]Center for Thermal Spray Research

9:00 AM
Improved Performance of Suspension Plasma Sprayed Thermal Barrier Coatings (TBCs): *Robert Vassen*[1]; Dapeng Zhou[1]; Christoph Vorkötter[1]; [1]Forschungszentrum Jülich GmbH

9:20 AM
Luminescence Characterization of Temperature Sensitive Phosphor Doped Thermal Barrier Coatings: Quentin Fouliard[1]; Sandip Haldar[1]; Alexander Olvera[1]; David Moreno[2]; Mary McCay[2]; Ramesh Subramanian[3]; Bauke Heeg[4]; Ranajay Ghosh[1]; *Seetha Raghavan*[1]; [1]University of Central Florida; [2]Florida Institute of Technology; [3]Siemens Energy; [4]Lumium Optical Precision Measurement Solutions

9:40 AM
Modeling and Validation of Land-based Gas Turbine TBC Lifetime: *Kenneth Kane*[1]; Bruce Pint[1]; [1]ORNL

10:00 AM Break

10:20 AM Invited
Mach 0.3 Burner Test of YSZ-Ti2AlC at 1300°C: *James Smialek*[1]; Michael Cuy[2]; Bryan Harder[2]; Anita Garg[2]; Richard Rogers[2]; [1]NASA Glenn Research Center, retired; [2]NASA Glenn Research Center

10:50 AM Invited
Surface Modification of Yttria Stabilized Zirconia Thermal Barrier Coatings Produced by Freeze Casting: *Said Bakkar*[1]; Mangesh Pantawane[1]; Anindya Ghoshal[2]; Michael Walock[2]; Marcus Young[1]; Diana Berman[1]; Narendra Dahotre[1]; Samir Aouadi[1]; [1]University of North Texas; [2]U.S. Army Research Laboratory

11:20 AM Invited
Protective Ceramic Coatings by Dry Aerosol Deposition of Extraterrestrial Regolith: *Paul Fuierer*[1]; Robert Calvo[1]; Gregory Strobel[1]; [1]New Mexico Institute of Mining & Technology

11:50 AM
Assessment of Microwave Magnetic Properties of Barium Hexaferrite Films Formed by Aerosol Deposition: *Scooter Johnson*[1]; Dong-Soo Park[2]; Sanghoon Shin[1]; Edward Gorzkowski[1]; [1]Naval Research Laboratory; [2]Korean Institute of Materials Science

Synthesis, Characterization, Modeling 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 (NIST); Kevin Huang, University of South Carolina

Wednesday AM
October 2, 2019

Room: D139
Location: Oregon Convention Center

Session Chairs: Winnie Wong-Ng, National Institute of Standards and Technology; Matthew Lawson, Boise State University

8:00 AM Introductory Comments

8:05 AM Invited
UntiDual-layer MOF Composite Membranes with Tunable Gas Transport Properties for Post-combustion CO_2 Separationtled: *David Hopkinson*[1]; Sameh Elsaidi[1]; Surendar Venna[1]; Mona Mohamed[2]; Michael Gipple[1]; [1]Doe/Netl; [2]University of Pittsburgh

8:25 AM Invited
Understanding the Influence of Novel CO2-responsive Phase Changing Fluids on Directing Flow Through Geo-mimicked and Natural Porous Materials for Energy Recovery: *Greeshma Gadikota*[1]; Hassnain Asgar[1]; [1]University of Wisconsin, Madison

8:45 AM Invited
A ScSZ-MC Dual-phase Membrane for Pre-combustion CO_2 Capture: *Shichen Sun*[1]; Kevin Huang[1]; [1]University of South Carolina

9:05 AM Invited
Gas-diffusion Layer Properties and Tin Electrodeposition Parameters for Carbon Dioxide Reduction Electrocatalysts: *Brian Skinn*[1]; McLain Leonard[2]; Dan Wang[1]; Antoni Forner-Cuenca[2]; Stephen Snyder[1]; Fikile Brushett[2]; EJ Taylor[1]; [1]Faraday Technology, Inc.; [2]Department of Chemical Engineering, Massachusetts Institute of Technology

9:25 AM Invited
Reference High-pressure Adsorption Isotherms: Results of Interlaboratory Studies: *Huong Giang Nguyen*[1]; Laura Espinal[1]; Blaza Toman[1]; Christopher Sims[1]; Matthias Thommes[2]; Roger van Zee[1]; [1]National Institute of Standards and Technology; [2]Friedrich-Alexander University

9:45 AM Invited
First-principles Studies of Porous Manganese Dioxide Octahedral Molecular Sieve OMS-5: *Matthew Lawson*[1]; Lan Li[1]; [1]Boise State University

10:05 AM Break

10:25 AM Invited
Flexible Metal-organic Framework (MOF), NiL[Ni(CN)4]n, L=Azo-Pyridine: *Winnie Wong-Ng*[1]; Gregory McCandless[2]; Jeffrey Culp[3]; Yu-Sheng Chen[4]; Daniel Siderius[1]; Matthew Lawson[5]; Lan Li[5]; [1]National Institute of Standards and Technology; [2]University of Texas at Dallas; [3]LRST/Battelle, National Energy Technology Laboratory; [4]University of Chicago at Advanced Photon Source; [5]Boise State University

10:45 AM Invited
Metal-organic Framework Thin Films as Chemical Sensing Layer: *Ki-Joong Kim*[1]; Jeffrey Culp[1]; James Ellis[1]; Paul Ohodnicki[1]; [1]National Energy Technology Laboratory

11:05 AM Invited
Flexible Metal-organic Frameworks for Gas Separation: A Mechanistic Investigation: *Wei Zhou*[1]; [1]National Institute of Standards and Technology

11:25 AM Invited
Thermodynamic Complexity of Transition Metal Ion-exchanged Zeolites: Xianghui Zhang[1]; *Di Wu*[1]; [1]Washington State University

11:45 AM Invited
Density Functional Theory Studies of Ferrous Metal-organic Cages: *Eric Cockayne*[1]; Mitchell Groenenboom[1]; Kathleen Schwarz[1]; [1]National Institute of Standards and Technology

Thermal Protection Materials and Systems — TPS Computational Methods & Approaches/TPS Materials Development & Testing I

Program Organizers: Jeff DeMange, Integration Innovation, Inc. (i3); Frances Hurwitz, NASA Glenn Research Center; Arturs Jasjukevics, ArianeGroup; Thomas Reimer, German Aerospace Center

Wednesday AM
October 2, 2019

Room: B114
Location: Oregon Convention Center

Session Chairs: Thomas Reimer, German Aerospace Center; Jeff DeMange, i3

8:00 AM
Computational and Experimental Study of Heat Transfer through Flexible Ceramic-fiber Thermal Protection Systems: *Rodrigo Penide-Fernandez*[1]; Frederic Sansoz[1]; [1]The University of Vermont

8:30 AM
Computational Materials Techniques for Thermal Protection Solutions: Materials and Process Design: *Justin Haskins*[1]; Lauren Abbott[1]; Joshua Monk[1]; [1]AMA, Inc

9:00 AM
Icarus v1.2: A Scalable Tool for Spacecraft TPS Modeling: *Eric Stern*[1]; Joseph Schulz[1]; Grant Palmer[1]; Justin Haskins[1]; [1]NASA Ames Research Center

9:30 AM
The Effect of Fibrous Geometry on Thermomechanical Behavior of Phenolic Impregnated Carbon Ablators for Use in Thermal Protection Systems: *Katherine Moody*[1]; Skylar Mays[1]; Mujan Seif[1]; Matthew Beck[1]; [1]University of Kentucky

9:50 AM Concluding Comments

10:00 AM Break

10:20 AM
Development of a Low-density Phenolic-impregnated Fibrous Ablator: *Thomas Reimer*[1]; Christian Zuber[1]; [1]DLR

10:50 AM
Development of Domestic Lyocell based Phenolic Impregnated Carbon Ablators (PICA-D) for Future NASA Missions: *Matthew Gasch*[1]; Mairead Stackpoole[1]; Kristina Skokova[1]; Keith Peterson[1]; Don Ellerby[1]; Dinesh Prabhu[1]; Frank Milos[1]; Steven Violette[2]; [1]NASA Ames Research Center; [2]Fiber Materials Inc.

11:20 AM
Heatshield for Extreme Entry Environment Technology (HEEET) Thermal Protection System (TPS): *Donald Ellerby*[1]; Matthew Gasch[1]; Mairead Stackpoole[1]; Peter Gage[2]; Ethiraj Venkatapathy[1]; [1]NASA Ames Research Center; [2]NEERIM

11:50 AM Concluding Comments

Thermodynamics of Materials in Extreme Environments — Experimental and Computational Thermodynamics of Protective Barriers and Reactivity of Materials under Extreme Conditions

Program Organizers: Kyle Brinkman, Clemson University; Kristina Lilova, University California Davis; Alexandra Navrotsky, University California Davis; Jake Amoroso, Savannah River National Laboratory; Fei Peng, Clemson University; Xingbo Liu, West Virginia University; Gustavo Costa , NASA; Xiaofeng Guo, Washington State University

Wednesday AM
October 2, 2019

Room: C124
Location: Oregon Convention Center

Session Chair: Kristina Lilova, University of California, Davis

8:00 AM Invited
Stability of Complex Silicate Environmental Barrier Coating Candidate Materials in High-temperature Water-vapor: Mackenzie Ridley[1]; Ingo Markel[2]; Hans Seifert[2]; *Elizabeth Opila*[1]; [1]University of Virginia; [2]Karlsruhe Institute of Technology

8:30 AM
Oxidative High Temperature Solution Calorimetry of Pure Elements and Application to the Thermodynamics Studies of Non-oxide Systems: Kristina Lilova[1]; *Mykola Abramchuk*[1]; Alexandra Navrotsky[1]; [1]University of California, Davis

9:00 AM
Correlated Multimodal In-situ Gas-metal Alloy Surface Reaction Studies: Elizabeth Kautz[1]; *Bharat Gwalani*[1]; Libor Kovarik[1]; Sten Lambeets[1]; Daniel Perea[1]; Arun Devaraj[1]; [1]Pacific Northwest National Laboratory

9:20 AM
Electrochemical and Calorimetric Study of Ag-Li-Sb Alloys: Monika Bugajska[1]; *Przemyslaw Fima*[1]; [1]Institute of Metallurgy & Materials Science PAS

9:40 AM Invited
Behavior of Ultra-high Temperature Ceramics in the Hypersonic Flight Environment: *William Fahrenholtz*[1]; [1]Missouri University of Science and Technology

10:10 AM Break

10:30 AM
High Temperature Vaporization into Different Environments: *Nathan Jacobson*[1]; Maria Kuczmarski[1]; Benjamin Kowalski[1]; [1]Nasa Glenn Research Center

10:50 AM
Thermodynamic Simulation and Materials Corrosion in Hydrothermal Liquefaction Biorefining Conditions: *Minkang Liu*[1]; Yimin Zeng[2]; Jing-Li Luo[3]; [1]University of Alberta ; [2]CanmetMATERIALS; [3]University of Alberta

11:10 AM
Uncovering the Oxidation Mechanisms of Nickel-based Alumina-forming Alloys: *Talia Barth*[1]; [1]University of Michigan, Ann Arbor

11:30 AM
Thermodynamics Analysis of Flowing for SHS-reactions in System Ni-Al Alloys: *Borys Sereda*[1]; Yuriy Belokon[1]; Karina Belokon[1]; Dmytro Kruglyak[1]; Irina Kruglyak[1]; Dmytro Sereda[1]; [1]Dneprovsky State Technical University

Ultra High Performance Metallic Systems for Aerospace, Defense, and Automotive Applications — Ultrafine Grain and Severe Plastic Deformation Influence on Materials

Program Organizers: Ali Yousefiani, Boeing Research And Technology; Troy Topping, California State University, Sacramento; Robert Dillon, NASA Jet Propulsion Laboratory; Linruo Zhao, National Research Council of Canada

Wednesday AM
October 2, 2019

Room: D140
Location: Oregon Convention Center

Session Chairs: Ali Yousefiani, Boeing Research And Technology; Troy Topping, California State University, Sacramento

8:00 AM Invited
Precipitate Formation Mechanisms during High-shear Solid Phase Processing Events: *Suveen Mathaudhu*[1]; Anthony Reynolds[2]; Glenn Grant[1]; Cynthia Powell[1]; [1]Pacific Northwest National Laboratory; [2]University of South Carolina / PNNL

8:40 AM
Thermal Behavior of Ultra-fine Gradient Microstructure via Severe Plastic Deformation: *Maryam Jamalian*[1]; David Field[1]; [1]Washington State University

9:00 AM
Bulk-state Reaction for Synthesizing Bulk Hybrid Alloys through High-pressure Torsion: Jae-Kyung Han[1]; Jae-il Jang[2]; Terence Langdon[3]; *Megumi Kawasaki*[1]; [1]Oregon State University; [2]Hanyang University; [3]University of Southampton

9:20 AM
Influence of Equal-Channel Angular Pressing on the Microstructure, the Corrosion and the Fatigue-corrosion Behavior of a 6xxx Aluminum Alloy for Automotive Conductors: *Clement Rochet*[1]; Skyler Davis[2]; Adrien Laurino[3]; Jean-Paul Harouard[3]; Babak Arfaei[4]; Terry Lowe[2]; Gregory Odemer[5]; Muriel Veron[6]; Christine Blanc[5]; [1]CIRIMAT / LEONI Wiring Systems France S.A.S.; [2]Colorado School of Mines; [3]LEONI Wiring Systems France S.A.S.; [4]Ford Motor Company; [5]CIRIMAT; [6]SIMaP

9:40 AM
Mechanism Controlled Rolling: *Sebastian Wesselmecking*[1]; Wolfgang Bleck[2]; Marco Haupt[3]; [1]RWTH Aachen - Steel Institute; [2]Rwth Aachen - Steel Institute; [3]RWTH Aachen - Institute of Metal Forming

10:00 AM Break

10:20 AM
Evolution in Mechanical Response, Phase Transformation and Texture of Titanium Aluminide Processed by High-pressure Torsion: *Jae-Kyung Han*[1]; Xi Li[2]; Rian Dippenaar[2]; Klaus-Dieter Liss[3]; Megumi Kawasaki[1]; [1]Oregon State University; [2]University of Wollongong; [3]Guangdong Technion - Israel Institute of Technology

10:40 AM
Structures Formed under High Strain Deformation of Ni-based Superalloys: *Agnieszka Wusatowska-Sarnek*[1]; Adam Kruk[2]; [1]Pratt & Whitney; [2]AGH University of Science and Technology

11th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Energy, Sustainability, and Biobased Materials II

Program Organizers: Surojit Gupta, University of North Dakota; Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technololgy; John Wolodko, University of Alberta; Christopher Taylor, DNV GL; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin; 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

Wednesday PM
October 2, 2019

Room: Portland Ballroom 255
Location: Oregon Convention Center

Session Chairs: Soumik Banerjee, Washington State University; Jinyang Wang, IMR; Kalpana Katti, North Dakota State University

2:00 PM Invited
Alternative Spinel for Advanced Electrical Conductive Layer for SOFC Stacks: *Jung Pyung Choi*[1]; Jeff Bonnett[1]; Nathan Canfield[1]; Jeffry Stevenson[1]; [1]Pacific Northwest National Laboratory

2:20 PM Invited
Tunable Strength of Yb2Si2O7 Interphase for Different Requirements in SiCf/SiC CMC: Inspiration from SiCf/Yb2Si2O7 Model Composite Investigation: *Jingyang Wang*[1]; [1]Shenyang National Laboratory for Materials Science, Institute of Metal Research

2:40 PM
From Waste Steel to Materiel: Agile Production Enabled by Additive Manufacturing: Karl Sundberg[1]; Jianyu Liang[1]; Diran Apelian[1]; Brajendra Mishra[1]; *Richard Sisson*[1]; Jian Yu[2]; Brandon McWilliams[2]; [1]Worcester Polytechnic Institute; [2]US Army Research Laboratory

3:00 PM Invited
Green Process for Preparation of Nickel Hydroxide Films via Solution Growth: *Allen Apblett*[1]; Audrey Vecoven[1]; Russel Dewan Rahman[1]; [1]Oklahoma State University

3:20 PM Break

3:40 PM Invited
Fabricating Optical Silica Glasses Derived from SBA-15 Powders by SPS: *Lianjun Wang*[1]; Wan Jiang[1]; [1]Donghua University

4:00 PM
Towards Titanium Recovery from Waste Slag: Ultra-high Temperature Molten Oxide Electrolysis: *Catherine Bishop*[1]; Samuel Martin Treceno[1]; Nic Weaver[1]; Aaron Marshall[1]; Matthew Watson[1]; [1]University of Canterbury

4:20 PM
Utilization of Microwave Technology in the Enrichment of Critical Rare Earth Elements from Coal Fly Ash : *Gunes Yakaboylu*[1]; Daniel Baker[1]; Brandon Wayda[1]; Katarzyna Sabolsky[1]; John Zondlo[1]; Christina Wildfire[2]; Edward Sabolsky[1]; [1]West Virginia University; [2]US DOE-National Energy Technology Laboratory

4:40 PM
Investigation of Sintering a Mixed Powder including Alumina and Aluminum for Control of Volume Shrinkage during Sintering: *Ken'ichiro Kita*[1]; Naoki Kondo[1]; Mikinori Hotta[1]; [1]National Institute of Advanced Industrial Science and Technology

5:00 PM
Synthesis and Characterization of Novel Lignin-metal Composites: *Grant Ellis*[1]; Zhuhang Xie[1]; Maharshi Dey[1]; Caleb Matzke[1]; Yun Ji[1]; Surojit Gupta[1]; [1]University of North Dakota

ACerS Robert B. Sosman Award Symposium: From Carbides to Carbons - from Bulk to Nano — ACerS Basic Science Division Robert B. Sosman Lecture

Program Organizer: Babak Anasori, Drexel University

Wednesday PM
October 2, 2019

Room: Portland Ballroom 253
Location: Oregon Convention Center

1:00 PM Invited
Nanomaterials Born from Ceramics: Transformative Synthesis of Carbons, Carbides and Nitrides: *Yury Gogotsi*[1]; [1]Drexel University

ACerS Robert B. Sosman Award Symposium: From Carbides to Carbons - from Bulk to Nano — Session II

Program Organizer: Babak Anasori, Drexel University

Wednesday PM
October 2, 2019

Room: Portland Ballroom 253
Location: Oregon Convention Center

Session Chairs: Bastian Etzold, Technische Universität Darmstadt; Babak Anasori, Indiana University-Purdue University Indianapolis

2:00 PM Invited
Ordered Multi-transition Metal Carbides and their MXenes: *Babak Anasori*[1]; [1]Indiana University- Purdue University Indianapolis

2:30 PM Invited
Preferential Oxidation in a High Entropy Carbide Ultra-high Temperature Ceramic: Lavina Backman[1]; *Elizabeth Opila*[1]; [1]University of Virginia

3:00 PM Invited
Redesigning Grain Boundaries in Ceramic Materials: *Clive Randall*[1]; [1]Pennsylvania State University

Additive Manufacturing of Glass, Ceramics and Composites — Additive Manufacturing of Glass, Ceramics and Composites V

Program Organizers: Tobias Schaedler, Hrl Laboratories Llc; Matthew Dickerson, Air Force Research Laboratory; Rebecca Dylla-Spears, Lawrence Livermore National Laboratory; Chang-Jun Bae, Korea Institute of Materials Science (KIMS)

Wednesday PM
October 2, 2019

Room: B113
Location: Oregon Convention Center

Session Chair: Tobias Schaedler, HRL Laboratories, LLC

2:00 PM
Design and Fabrication of Dense SiC Composites by a Combination of Additive Manufacturing and Reactive Melt Infiltration: *Corson Cramer*[1]; Edgar Lara-Curzio[1]; Amy Elliott[1]; Christina Padilla[1]; Alexis Flores-Betancourt[1]; James Klett[1]; Michael Lance[1]; Derek Siddel[1]; Kashif Nawaz[1]; [1]Oak Ridge National Laboratory

2:30 PM
Binder-jet Printing of Silicon Carbide: Chuyuan Zheng[1]; *Ian Nettleship*[1]; Jung-Kun Lee[1]; [1]University of Pittsburgh

2:50 PM
Binder Jetting Additive Manufacturing of Ceramics: Preparation of Feedstock Powder with High Flowability and Sinterability: *Wenchao Du*[1]; Guanxiong Miao[1]; Zhijian Pei[1]; Chao Ma[1]; [1]Texas A&M University

3:10 PM
Model-guided Powder Mixing for Feedstock Preparation of Ceramic Binder Jetting: *Mark Du*[1]; Zhijian Pei[2]; Chao Ma[2]; Dileep Singh[1]; [1]Argonne National Laboratory; [2]Texas A&M University

3:30 PM
Mechanical Performance of Ceramic-metallic Composites Using A Binder Jetting 3D Printing Technology: *Pedro Cortes*[1]; Kyle Myers[2]; Brian Hetzel[3]; Brett Conner[1]; Eric MacDonald[1]; [1]Youngstown State University; [2]ExOne; [3]Fireline, Inc.

3:50 PM Break

4:10 PM
Saturation Characteristics for Interfacial Coupling Enhancement of Cement Granules in AM Process: *Seung Yeop Chun*[1]; Bora Jeong[1]; Hee Soo Lee[1]; Hong-Dae Kim[1]; [1]Korea Institute of Industrial Technology

4:30 PM
3D Printing of High-strength Continuous Carbon Fiber Reinforced Thermoplastics: *Pedram Parandoush*[1]; Dong Lin[1]; [1]Kansas State University

4:50 PM
3D Printing of Multicomponent Glasses Using Phase-separating Resins: *Lorenzo Barbera*[1]; David Moore[1]; Kunal Masania[2]; Andre Studart[1]; [1]ETH Zurich; [2]ETH Zürich

5:10 PM
Metal-polymer Composite Medical Device Fabricated by Additive Manufacturing: *Yao Zhao*[1]; Sharad Acharya[1]; Weixiao Gao[1]; Haoqi Li[1]; Jacob Celli[1]; Jezreel Konstantinos[1]; Parsaoran Hutapea[1]; Fei Ren[1]; [1]Temple University

Additive Manufacturing of Metals: Microstructure and Material Properties of Nickel-based Alloys — AM Process - Microstructure - Properties

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

Wednesday PM
October 2, 2019

Room: B117
Location: Oregon Convention Center

Session Chair: Ola Harrysson, North Carolina State University

2:00 PM
High-throughput Characterization of Additively Manufactured Nickel Superalloy 625 Using a Combinatorial Sample to Rapidly Screen Process-Microstructure-Mechanical Property Information: *Jordan Weaver*[1]; Thien Phan[1]; Adam Pintar[1]; Carlos Beauchamp[1]; Kil-Won Moon[1]; Kerry Siebein[1]; [1]National Institute of Standards and Technology

2:20 PM
Toward an Understanding of Cracking, Scan Strategy and Airfoil Geometry in Electron Beam Powder Bed Additive Manufacturing: *Yousub Lee*[1]; Mike Kirka[1]; Ryan Dehoff[1]; [1]Oak Ridge National Laboratory

2:40 PM
Effect of Intra-build Location and Loading Direction on Quasi-static and Dynamic Response of Additively Manufactured Inconel 718: *Nadia Kouraytem*[1]; Raphael Chanut[1]; Dillon Watring[1]; Owen Kingstedt[1]; Ashley Spear[1]; [1]The University of Utah

3:00 PM
Selective Laser Melting of Inconel 625 Superalloy with Enhanced Hardness: *Amir Dehghanghadikolaei*[1]; Kijoon Lee[1]; Vinay Doddapaneni[1]; Lucas Freiberg[1]; Matthew Conlyn[1]; Chih-hung Chang[1]; Goran Jovanovic[1]; Brian Paul[1]; Somayeh Pasebani[1]; [1]Oregon State University

3:20 PM Break

3:40 PM
Optimization of Heat Treatment Parameters for Additive Manufacturing Hastelloy X: *Alber Sadek*[1]; Hyeyun Song[1]; [1]Edison Welding Institute (EWI)

4:00 PM
The Heat Treatment for Nickel-base Superalloy Fabricated by Laser-powder Bed Fusion (L-PBF) Additive Manufacturing (AM): *Hyeyun Song*[1]; Paul Boulware[1]; Rodrigo Enriquez[1]; Heimdall Mendoza[1]; Alber Sadek[1]; [1]EWI

4:20 PM
Residual Strain Mapping of Additively Manufactured Inconel 718 Blade: *Lianghua Xiong*[1]; Andrew Chuang[1]; Dileep Singh[1]; [1]Argonne National Laboratory

4:40 PM
Residual Stress Measurements and Predictions for IN625 SLM Parts: *Jose Rivas*[1]; Seetha Raghavan[1]; [1]University of Central Florida

5:00 PM
Effect of Part Size on Powder Bed Fusion IN718 Parts: Oliver Holzmond[1]; *Alex Jarama*[1]; Guofeng Wang[2]; Xiaodong Li[1]; [1]University of Virginia; [2]University of Pittsburgh

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing: Design, Modeling, Simulations, Defects and Inspection

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

Wednesday PM
October 2, 2019

Room: B115
Location: Oregon Convention Center

Session Chair: Ulf Ackelid, Freemelt AB

2:00 PM
A Design Framework for Lattice Structure Testing and Implementation: *Colt Montgomery*[1]; Cole Britt[2]; Connie Dong[3]; Don Brown[1]; Matthew Begley[3]; Brian Patterson[1]; Allison Beese[2]; Robin Pacheco[1]; Michael Brand[1]; John Carpenter[1]; [1]Los Alamos National Laboratory; [2]Pennsylvania State University; [3]University California Santa Barbara

2:20 PM
An Optimization Modeling Framework for Additive Manufacturing Parts Using their Reliability and Inspectability: *Behrooz Jalalahmadi*[1]; [1]Sentient Science

2:40 PM
Constitutive Structural Parameter for the Work Hardening Behavior of Additively Manufactured Metal Alloys: *Alan Jankowski*[1]; Wei-Yang Lu[1]; Nancy Yang[1]; [1]Sandia National Laboratories

3:00 PM
Designing Steels for AM- What Can We Learn from Welding?: *Niyanth Sridharan*[1]; Lizhen Tan[1]; Ying Yang[1]; Kevin Field[1]; [1]Oak Ridge National Laboratory

3:20 PM Break

3:40 PM
Effect of Interactions between Flaws and Material Properties on Component Performance: *Christopher Laursen*[1]; Jay Carroll[1]; Jody Bartanus[2]; Garrett Pataky[2]; [1]Sandia National Laboratories; [2]Clemson University

4:00 PM
Numerical Prediction of PBF Thermal History and Microstructure: Bonnie Attard[1]; S. Cruchley[1]; Y. Chiu[1]; M. Attallah[1]; Paul Dionne[2]; Christoph Beetz[2]; Joerg Willem[2]; *Mustafa Megahed*[2]; [1]University of Birmingham; [2]Esi Group

4:20 PM
Simultaneous Transformation Kinetics Model for AM: *Narendran Raghavan*[1]; Srdjan Simunovic[1]; Mike Kirka[1]; John Turner[1]; [1]Oak Ridge National Laboratory

4:40 PM
Systematic Generation of Process Parameter Induced Lack of Fusion Defects: *Brett Conner*[1]; Varthula De Silva Jayasekera[1]; Jeremy McKnight[1]; Jared Blecher[2]; Griffin Jones[3]; Kenneth Meinert[3]; Austin Ngo[4]; John Lewandowski[4]; [1]Youngstown State University; [2]3D Systems; [3]Pennsylvania State University; [4]Case Western Reserve University

5:00 PM
Selective Electron Beam Melting – Next Step in Metal Additive Manufacturing?: Matthias Gieseke[1]; *Madison Burns*[1]; Anne Rathje[1]; Christoph Wangenheim[1]; [1]Baker Hughes, a GE company

Additive Manufacturing of Metals: Post Processing — Surface Modification

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

Wednesday PM
October 2, 2019

Room: B110
Location: Oregon Convention Center

Session Chair: Chris Rock, NC State University

2:00 PM Invited
Electrochemical Surface Finishing of Complex Additively Manufactured Parts: *Timothy Hall*[1]; Jennings Taylor[1]; Holly Garich[1]; Danny Liu[1]; Stephen Snyder[1]; [1]Faraday Technology, Inc.

2:40 PM
A Comparison of Bioactive Anodization Coatings on Wrought and Additively-manufactured Ti-6Al-4V Substrates: *Haden Johnson*[1]; Hayden Coffey[1]; Ryan Stokes[2]; Haley Doude[2]; Amol Janorkar[1]; R Williamson[1]; Michael Roach[1]; [1]University of Mississippi Medical Center; [2]Mississippi State University

3:00 PM
Correlation between Surface Texture and Mechanical Performance of AM Components: *Agustin Diaz*[1]; Patrick McFadden[1]; [1]REM Surface Engineering

3:20 PM
Fatigue Behavior of Post-build Surface Processing on Electron Beam Melted Ti-6Al-4V: *Carter Keough*[1]; Harvey West[1]; Richard Wysk[1]; Ola Harrysson[1]; [1]North Carolina State University

3:40 PM Break

4:00 PM
Impact of Sensitization and Etching Parameters to Selectively Dissolve Support Structures from PBF-processed Metal Components: Pengfei Yang[1]; Subbarao Raikar[1]; *Owen Hildreth*[1]; [1]Colorado School of Mines

4:20 PM
Multiscale Area Analysis of Surfaces Produced in a Laser Powder Bed Fusion Process: Nathaniel Rutkowski[1]; Matthew White[2]; Timothy Horn[2]; Christopher Brown[1]; *Sneha Prabha Narra*[1]; [1]Worcester Polytechnic Institute; [2]North Carolina State University

4:40 PM
Surface Finishing of DMLS and DED IN-625 for Optimal Mechanical Performance: *Patrick McFadden*[1]; Agustin Diaz[1]; [1]REM Surface Engineering

Additive Manufacturing: Microstructure and Material Properties of Titanium-based Alloys — Directed Energy Deposition and Other Technologies

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

Wednesday PM
October 2, 2019

Room: B116
Location: Oregon Convention Center

Session Chair: Sudarsanam Babu, University of Tennessee, Knoxville

2:00 PM
As-deposited Tensile Behavior and Microstructure of MELD Solid-state Additive Manufactured Ti-6Al-4V: *M. Miller*[1]; Paul Allison[1]; Chase Cox[2]; Dustin Avery[1]; Richard Martens[1]; [1]The University of Alabama; [2]MELD Manufacturing

2:20 PM
Demonstration of Strength-ductility Property Maps to Identify Critical Structure-property Relationships in PM/AM Ti-6Al-4V Alloys: *K. S. Ravi Chandran*[1]; Pankaj Kumar[2]; [1]University of Utah; [2]University of Nevada at Reno

2:40 PM
Fracture Toughness and Fatigue Crack Growth Rate Properties of AM Repaired Ti-6Al-4V by Direct Energy Deposition: Sulochana Shrestha[1]; *Manigandan Kannan*[1]; Joseph Rassi[1]; Gregory Morscher[1]; Andrew L. Gyekenyesi[2]; Onome Scott Emuakpor[3]; [1]University of Akron; [2]Ohio Aerospace Institute; [3]Aerospace Systems Directorate, Wright-Patterson AFB

3:00 PM
Reactive-deposition of B4C+BN Titanium-matrix Composites for High-temperature Applications: *Kellen Traxel*[1]; Amit Bandyopadhyay[1]; [1]Washington State University

3:20 PM Break

3:40 PM
Residual Stress Modelling of Additively Manufactured Ti6Al4V ELI Alloy Samples: *Amukelani Sydney Ngoveni*[1]; [1]Tshwane University of Technology

4:00 PM
Analyses of Microstructure and Mechanical Properties of Additively Repaired Ti-6Al-4V by Direct Energy Deposition: *Sulochana Shrestha*[1]; Manigandan Kannan[1]; Raghav P. Panakarajupally[1]; Gregory Morscher[1]; Andrew L. Gyekenyesi[2]; Onome Scott Emuakpor[3]; [1]University of Akron; [2]Ohio Aerospace Institute; [3]Aerospace Systems Directorate, Wright-Patterson AFB

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

Program Organizers: Evelina Vogli, LM Group Holdings Inc.; Fei Tang, DNV GL; Arif Mubarok, PPG; Mary Lyn Lim, PPG Industries

Wednesday PM
October 2, 2019

Room: B118
Location: Oregon Convention Center

Session Chairs: Arif Mubarok, PPG; Mary Lin Lym, PPG; Evelina Vogli, LM Group Holdings Inc.

2:00 PM Invited
On the Friction and Anti-galling Properties of Engineering Coatings and Surface Treatments: *Manuel Marya*[1]; Virendra Singh[1]; Hong Liang[2]; Yan Chen[2]; [1]Schlumberger Technology Corp; [2]Texas A&M University, Mechanical Engineering

2:20 PM
Application of Plasma Enhanced Chemical Vapor Deposition (PECVD) to Prevent Plating of Metallic Materials for Small Caliber Suppressor Applications: *Adam Foltz*[1]; Christopher Mulligan[1]; [1]US Army ARDEC

2:40 PM
Tribological Performance of Alternative Die Materials for Trimming of Advanced High Strength Steels: *Zeyuan Cui*[1]; Alexandra Rose[1]; Daniel Green[1]; Jimmy Tjong[1]; Ahmet Alpas[1]; [1]University of Windsor, MAME

3:00 PM
Oxidized Zirconium Alloy ZrNb7 for Tribological Applications – Diffusion Hardening Process for Improved Surface Properties: *Mike Mosbacher*[1]; Uwe Glatzel[1]; [1]Metals and Alloys, University Bayreuth

3:20 PM Break

3:30 PM
Characterization of as-Welded Microstructure in Fe-Cr-C-B Wear-resistant and Corrosion-resistant Welding Overlay: *Jing Li*[1]; Rangasayee Kannan[1]; Leijun Li[1]; [1]Department of Chemical and Materials Engineering, University of Alberta

3:50 PM
Effect of Tribocorrosion on the Bond Strength of Electrodeposited Ni-graphene Composite Surface Coatings on AZ31B Mg Alloy: *Arpith Siddaiah*[1]; Pankaj Kumar[1]; Manoranjan Misra[1]; Pradeep Menezes[1]; [1]University of Nevada, Reno

4:10 PM
Corrosion and Coating Properties of Novel Treatment Solutions on Aluminum Alloys: *Betsy Brown*[1]; [1]PPG Industries

4:30 PM
High Corrosion Resistant and Eco-friendly Trivalent Chromium Based Coatings for Hot-dip Zin Alloy Coated Steel Sheet: *Soo Hyoun Cho*[1]; Young Jun Park[1]; [1]POSCO

4:50 PM
Electrochemical Characterization of Titanium Based Graphene Nano Composites: *Muhammad Manzoor*[1]; Muhammad Yasin[1]; Muhammad Butt[1]; Tahir Ahmad[1]; Muhammad Kamran[1]; Faraz Hussain[1]; Fahad Riaz[1]; Muhammad Hassan[1]; [1]University of the Punjab

5:10 PM
Corrosion and Tribology Behaviour of TiC Thin Film on Titanium Alloys Grown by RF Magnetron Sputtering: *Olayinka Abegunde*[1]; [1]University of Johannesburg

Advanced Manufacturing, Processing, Characterization and Modeling of Functional Materials — NiTiHf Alloys

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

Wednesday PM
October 2, 2019

Room: D136
Location: Oregon Convention Center

Session Chairs: Mohammadreza Nematollahi, University of Toledo; Haluk Karaca, University of Kentucky

2:00 PM Invited
Machine Learning for Solving Metals AM Problems: *Aaron Stebner*[1]; [1]Colorado School of Mines

2:30 PM
Synchrotron Radiation X-ray Diffraction Measurements on Non-metallic Inclusions and their Effect on Fatigue Life in NiTiHf High Temperature Shape Memory Alloys: *Nathan Ley*[1]; Choongyep Lee[1]; Robert Wheeler[1]; Dimitris Lagoudas[2]; Marcus Young[1]; [1]University of North Texas; [2]Texas A&M University

3:00 PM
The Influence of Heat Treatment on the Transformation Behavior of Additively Manufactured NiTiHf Shape Memory Alloys: *Guher Pelin Toker*[1]; Mohammadreza Nematollahi[2]; Sayed Ehsan Saghainan[1]; Othmane Benafan[3]; Keyvan Baghbaderani[2]; Mohammad Elahinia[2]; Haluk Karaca[1]; [1]University of Kentucky; [2]University of Toledo; [3]NASA Glenn Research Center

3:20 PM
Effects of High Temperature Oxides on the Thermomechanical Properties of NiTiHf20 Shape Memory Alloy Wires: *Avery Young*[1]; Robert Wheeler[1]; Nathan Ley[1]; Othmane Benafan[2]; Marcus Young[1]; [1]University of North Texas; [2]NASA Glenn Research Center

3:40 PM Break

4:00 PM
Effects of Ni during Thermo-mechanical Processing in Ni-rich NiTiHf High Temperature Shape Memory Alloy: *Faith Gantz*[1]; Nathan Ley[1]; Robert Wheeler[1]; Marcus Young[1]; [1]University of North Texas

4:20 PM
Microstructure and Thermoelectric Properties of [001]c Grain-aligned Ca3Co4O9 Ceramics Prepared by Template Grain Growth: *Zongmo Shi*[1]; Jie Xu[1]; Feng Gao[1]; Mengjie Qin[1]; [1]Northwestern Polytechnical University

4:40 PM
The Influence of Thermal Cycling on the Indentation-induced Two-way Shape Memory Effect in NiTi Alloys: *Carl Frick*[1]; Christopher Laursen[1]; Mitchell Anderson[1]; [1]University of Wyoming

5:00 PM
Numerical Modeling of Solid Scrap Melting above Bath in an Electric Arc Furnace: Yu Wang[1]; Yuchao Chen[1]; Armin Silaen[1]; Yury Krotov[2]; Nicole Wiley[2]; *Chenn Zhou*[1]; [1]Purdue University Northwest; [2]Steel Dynamics, Inc

5:20 PM
Reactive Flash Sintering of Functional Ceramics: *Rishi Raj*[1]; [1]University of Colorado

Advances in Dielectric Materials and Electronic Devices — Ferroics and Related Materials

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

Wednesday PM
October 2, 2019

Room: A105
Location: Oregon Convention Center

Session Chairs: Steven Tidrow, Alfred University; Jose de los Santos Guerra, Universidade Federal de Uberlandia

2:00 PM Invited
Manipulating the Current-voltage (I-V) Characteristic of a Varistor to Produce Transistors and Sensors: *Raghvendra Pandey*[1]; [1]Texas State University

2:20 PM
Effect of $PbZrO_3$-Modification on the Structure and Relaxor Properties of High-T_C $BiScO_3$-$PbTiO_3$ Ceramics and Single Crystals: *Yi Yuan*[1]; Zuo-Guang Ye[1]; [1]Simon Fraser University

2:40 PM
GaV_4S_8 Crystal Grain Orientation Determined by Raman Scattering: *Karel Tesar*[1]; Ivan Gregora[2]; Pavla Beresova[2]; Premysl Vanek[2]; Petr Ondrejkovic[2]; Jiri Hlinka[2]; [1]Czech Technical University in Prague; [2]Institute of Physics of the Czech Academy of Sciences

3:00 PM
Low Temperature Printing of SiO_2 Dielectrics from Reactive Inks: Subbarao Raikar[1]; *Owen Hildreth*[1]; [1]Colorado School of Mines

3:20 PM Break

3:40 PM
Combination of Artificial and Natural Planar Absorbers: Towards a 70% Reduction in Thickness: *Aicha El Assal*[1]; Ratiba Benzerga[1]; Ala Sharaiha[1]; Ali Harmouch[1]; Akil Jrad[1]; [1]University of Rennes, IETR

4:00 PM Invited
Enhancement of Luminescence Intensity for Ln3+ doped Glasses: *Jakrapong Kaewkhao*[1]; [1]Nakhon Pathom Rajabhat University

4:20 PM
Photochromic Effect of Transparent Lead-free Ferroelectric $KSr_2Nb_5O_{15}$ Ceramics: *Shuyao Cao*[1]; Feng Gao[1]; Jie Xu[1]; Qian Chen[1]; [1]School of Materials Science and Engineering, Northwestern Polytechnical University

4:40 PM
Ferroelectric Based Composites Can Build a Better Photocatalyst: *Yaodong Yang*[1]; [1]Xian Jiaotong University

5:00 PM
Study of Magnetoeletric and Magntodieletric and Electric Impedance under the Action of Magnetic Field Coupling in Bi0.8Nd0.2Fe1-yCoyO3: *Anuar J. Mincache*[1]; Odair Oliveira[1]; Luiz Cotica[1]; Daniel Matos[1]; Julio Pastoril[1]; Ivair Santos[1]; Gustavo Sanguino[1]; [1]State University of Maringa

Advances in Understanding of Martensite in Steels — Characterization & Properties

Program Organizers: Ian Zuazo, ArcelorMittal Global R&D - (CRMC, Industeel); Amy Clarke, Colorado School of Mines; Eric Payton, Air Force Research Laboratory; Janelle Wharry, Purdue University; Kester Clarke, Colorado School of Mines; Eric Lass, University of Tennessee, Knoxville; Mohsen Asle Zaeem, Colorado School of Mines

Wednesday PM
October 2, 2019

Room: C125
Location: Oregon Convention Center

Session Chairs: Eric Lass, National Institute of Standards and Technology; Eric Payton, Air Force Research Laboratory

2:00 PM Invited
Martensite Formation in the Intercritically Reheated Coarse Grained Heat Affected Zone of Line Pipe Steels: *Matthias Militzer*[1]; Madhumanti Mandal[1]; Warren Poole[1]; [1]University of British Columbia

2:30 PM Invited
Understanding Martensite and Martensitic Phase Transformation under Extreme Environments: *Cheng Sun*[1]; Keyou Mao[2]; Janelle Wharry[2]; Paula Freyer[3]; Frank Garner[4]; [1]Idaho National Laboratory; [2]Purdue Unviersity; [3]Westinghouse Electric Company LLC; [4]Texas A&M University

3:00 PM
Reverse Transformation from Martensite into Austenite in a Dual Phase Steel: *Dany Andrade Centeno*[1]; Hélio Goldenstein[1]; [1]University of São Paulo

3:20 PM Break

3:40 PM Invited
Use of In-situ Methods to Investigate the Deformation Induced Martensitic Transformation: *Djamel Kaoumi*[1]; Francois-Ligori Paul[2]; Yuchen Zhao[1]; Matthew Frost[3]; Jun-Sang Park[4]; Jonathan Almer[4]; [1]North Carolina State University; [2]Phelma; [3]Oak Ridge National Laboratory; [4]Argonne National Laboratory

4:10 PM
Short Cycle Tempering of an 1800 MPa Grade of Press Hardening Steel: *Claire Bourque*[1]; Alexander Bardelcik[1]; Mary Wells[1]; Constantin Chiriac[2]; [1]University of Guelph; [2]Ford Research & Advanced Engineering

4:30 PM
***In Situ* Observation and Quantification of Microstructure Features in the Heat-affected Zone of 1.25Cr-0.5Mo Steel during Simulated Welding Cycle**: *Yang Shen*[1]; Cong Wang[1]; [1]Northeastern University

4:50 PM
Multi Length-scale Instrumented Indentation Study on Dual-phase (DP) Steels: *Ali Khosravani*[1]; Charles Caliendo[1]; Surya Kalidindi[1]; [1]Georgia Institute of Technology

Alloy Design for Additive Manufacturing: Developing New Feedstock Materials — Computational Materials Design and Advanced Characterization

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

Wednesday PM
October 2, 2019

Room: B111
Location: Oregon Convention Center

Session Chairs: Joseph McKeown, Lawrence Livermore National Laboratory; Christian Leinenbach, Empa

2:00 PM Invited
Additive Manufacturing of Steels – Alloy Development Aided by Computational Materials Design: *Greta Lindwall*[1]; Chia-Ying Chou[1]; Niklas Holländer Pettersson[1]; Durga Ananthanarayanan[1]; Annika Borgenstam[1]; Joakim Odqvist[1]; [1]KTH Royal Institute of Technology

2:30 PM
Alloy Design for Additive Manufacturing: Development and Application of a Materials Design Simulator: *Aurelien Perron*[1]; Bey Vrancken[1]; Nicholas Calta[1]; Tien Roehling[1]; John Roehling[1]; Julie Soderlind[1]; Thejaswi Tumkur Umanath[1]; Joel Berry[1]; Joseph McKeown[1]; Manyalibo Matthews[1]; [1]Lawrence Livermore National Laboratory

2:50 PM
ICME-based Evaluation and Optimization of Additively Manufactured High Toughness Naval Steels: *Amit Behera*[1]; Vladilena Gaisina[1]; Dana Frankel[1]; Greg Olson[1]; [1]QuesTek Innovations LLC

3:10 PM
Microsegregation-based Indicators of In-build Cracking Susceptibility under Repetitive Melting Conditions: *Ralph Napolitano*[1]; Tim Prost[2]; Shubhra Jain[1]; Emma White[2]; Iver Anderson[2]; [1]Iowa State University; [2]Ames Laboratory

3:30 PM Break

3:50 PM Invited
Novel In-situ Characterization of Solidification Dynamics Relevant for Additive Manufacturing: *Amy Clarke*[1]; Jonah Klemm-Toole[1]; Alec Saville[1]; Damien Tourret[2]; C. Gus Becker[1]; Benjamin Ellyson[1]; Yaofeng Guo[1]; Chloe Johnson[1]; Brian Milligan[1]; Andrew Polonsky[3]; Kira Pusch[3]; Kester Clarke[1]; Niranjan Parab[4]; Kamel Fezzaa[4]; Tao Sun[4]; Sven Vogel[5]; John Roehling[6]; Joespeh McKeown[6]; Sudarsanam Babu[7]; Tresa Pollock[3]; Alain Karma[8]; [1]Colorado School of Mines; [2]IMDEA; [3]University of California, Santa Barbara; [4]Argonne National Laboratory; [5]Los Alamos National Laboratory; [6]Lawrence Livermore National Laboratory; [7]University of Tennessee; [8]Northeastern University

4:20 PM
In-situ Microstructural Evolution of Rapidly Solidified Aluminum Alloys: *Chloe Johnson*[1]; Chandler Becker[1]; Benjamin Ellyson[1]; Yaofeng Guo[1]; Jonah Klemm-Toole[1]; Brian Milligan[1]; Alec Saville[1]; Andrew Polonsky[2]; Kira Pusch[2]; Niranjan Parab[3]; Kamel Fezzaa[3]; Tao Sun[3]; John Roehling[4]; Kester Clarke[1]; Tresa Pollock[2]; Joseph McKeown[4]; Amy Clarke[1]; [1]Colorado School of Mines; [2]University of California, Santa Barbara; [3]Argonne National Laboratory; [4]Lawrence Livermore National Laboratory

4:40 PM
Characterization of Vacuum Roll Coating Engineered Ti-6Al-4V Platelets for Metals Additive Manufacturing: Vicky Poenitzch[1]; *John Macha*[1]; William Hickey[1]; Erica Macha[1]; Ken Coulter[1]; Carl Popelar[1]; [1]Southwest Research Institute

5:00 PM
Multiscale Characterizations of the Microstructure and Mechanical Properties of Metallic Alloys Made by Laser Powder Bed Fusion: *Thomas Voisin*[1]; Jean-Baptiste Forien[1]; Joseph McKeown[1]; Manyalibo Matthews[1]; Y. Morris Wang[1]; [1]Lawrence Livermore National Laboratory

5:20 PM
Effect of Trace Y Addition on the Microstructure and Mechanical Properties of the As-cast Ti-6Al-4V Alloys: *Liqing Wang*[1]; Bang Xiao[1]; Shaoyang Zhao[1]; Jingou Yin[1]; Zengfeng Li[1]; Ping Tan[1]; Huiping Tang[1]; [1]Northwest Institute For Non-ferrous Metal Research

5:40 PM Concluding Comments

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

Program Organizers: Steven Thompson, Colorado School of Mines; C. Isaac Garcia, University of Pittsburgh

Wednesday PM
October 2, 2019

Room: C124
Location: Oregon Convention Center

Session Chair: Steven Thompson, Colorado School of Mines

2:00 PM
Tracking Down Niobium Precipitation in HSLA Steels at the Atomic Level: *Johannes Webel*[1]; Dominik Britz[1]; Hardy Mohrbacher[2]; Volker Flaxa[3]; Frank Mücklich[1]; [1]Saarland University Saarbrücken; [2]KU Leuven; [3]Engineering Office and Consultant, Salzgitter

2:20 PM
Tracing Competitive Segregation Effects in Boron Containing Micro-alloyed Steels: *Daniela Wipp*[1]; Maximilian Weiss[2]; Andreas Limbeck[2]; Alexander Gramlich[3]; Sabine Zamberger[4]; Matthew Galler[5]; Erwin Povoden-Karadeniz[1]; [1]TU Wien, CDL-IPE; [2]TU Wien; [3]RWTH Aachen; [4]voestalpine Forschungsservicegesellschaft Donawitz GmbH; [5]voestalpine Wire Rod Austria GmbH

2:40 PM
Quantitative Analysis of Heterogeneous Solute Segregation at Austenite Grain Boundary or Austenite / Ferrite Interphase Boundaries ~ Three Dimensional Atom Probe Analysis Complemented with Austenite Reconstruction Method: *Goro Miyamoto*[1]; Tadashi Furuhara[1]; [1]Tohoku University

3:00 PM
Applications of Machine Learning in Microscopy for Routine Assessment and Quality Assurance in Ferrous Alloy Production, Manufacturing and Service: *Roger Barnett*[1]; Alisa Stratulat[1]; [1]Carl Zeiss Microscopy

3:20 PM Break

3:45 PM
Analysis of Sigma Formation Mechanisms in Aged Hyper Duplex Stainless Steel: *Sanjeev Kumar*[1]; S Krisam[1]; A. Keplinger[2]; E. Povoden-Karadeniz[3]; [1]Christian Doppler Laboratory for Interfaces and Precipitation Engineering CDL-IPE TU Wien; [2]Voestalpine Böhler Edelstahl GmbH & Co KG, 8605 Kapfenberg, Austria; [3]Institute of Materials Science and Technology, TU Wien

4:05 PM
The Developed Orientation Relationship of the $\gamma \rightarrow \epsilon \rightarrow \alpha`$ Martensitic Transformation Using Electron Backscattered Diffraction: *Dan Field*[1]; Krista Limmer[2]; [1]Missouri University of Science & Technology; [2]U.S. Army Research Labratory

4:25 PM
Quantitative Analysis of Inconel 718 by SEM/EDS – Challenges and Possible Solutions: *John Konopka*[1]; [1]Thermo Fisher Scientific

4:45 PM
Analysis of Hardening Mechanisms in a Low-carbon Steel by Microscopy-spectroscopy and Nanoindentation Techniques: *Antonio Oliver-Reynoso*[1]; Octavio Vázquez-Gómez[1]; Alexis Gallegos-Pérez[1]; Edgar López-Martínez[2]; Bernardo Campillo-Illanes[3]; Héctor Vergara-Hernández[1]; [1]Tecnológico Nacional de México / I.T. Morelia; [2]Universidad del Istmo; [3]Universidad Nacional Autónoma de México

Bulk Metallic Glasses and their Composites – Progresses, Outcomes and Prospects — Glass Formation, Crystallization and Serration

Program Organizers: Muhammad Rafique; Weidong Li, Corning; Junwei Qiao, Taiyuan University of Technology

Wednesday PM
October 2, 2019

Room: E146
Location: Oregon Convention Center

Session Chair: John Perepezko, The University of Wisconsin - Madison

2:00 PM Invited
Ideal Metallic Glass: *Takeshi Egami*[1]; [1]University of Tennessee

2:40 PM Invited
Investigation of Crystallization and Relaxation in Metallic Glasses by High Rate Calorimetry: *John Perepezko*[1]; Meng Gao[1]; Wan Kim[2]; Eun Soo Park[2]; [1]University of Wisconsin - Madison; [2]Seoul National University

3:20 PM Break

3:40 PM Invited
DSC and X-ray Diffraction Investigation of Crystallization of Amorphous Co-Fe-Zr Alloys: *Kil-Won Moon*[1]; Fan Zhang[1]; Megan Butala[1]; Jason Hattrick-Simpers[1]; Andrew Allen[1]; Carelyn Campbell[1]; [1]National Institute of Standards & Technology

4:10 PM
Partition-dependent Selection of Glass-enabled Complex Intermetallics during Crystallization of Amorphous Al-Sm Alloys: *Ralph Napolitano*[1]; Fanqiang Meng[2]; Shihuai Zhou[3]; Ryan Ott[4]; Lin Zhou[4]; Matthew Kramer[4]; [1]Iowa State University; [2]Sun Yat-Sen University; [3]Arconic; [4]Ames Laboratory

4:40 PM
Characterization of Localized Plastic Deformation and Serration Behaviors Associated with Dynamic Strain Aging in Pipeline Steels Using Digital Image Correlation: *Taylor Jacobs*[1]; David Matlock[2]; Kip Findley[2]; [1]Los Alamos National Laboratory; [2]Colorado School of Mines

5:10 PM
Relationship between the Serration Behaviors and the Structural Flow-units in Materials: *Yong Zhang*[1]; [1]University of Science and Technology Beijing

Characterization of Materials and Properties through Metallography, Mechanical Testing and Analysis - From Fundamentals to the Cutting Edge — Microstructural Characterization and the Correlation of Microstructure to Mechanical Properties II

Program Organizer: Michael Keeble, Buehler

Wednesday PM
October 2, 2019

Room: F152
Location: Oregon Convention Center

Session Chairs: Dominik Britz, Universität des Saarlandes; George Vander Voort, Vander Voort Consulting L.L.C., Consultant - Struers Inc.; Andrew Havics, pH2, LLC

2:00 PM Invited
Metallographic Evaluation of Additive Manufactured 316L Parts Made by Binder Jet Printing: *Thomas Murphy*[1]; Christopher Schade[1]; [1]Hoeganaes Corporation

2:20 PM
Quantifying Visual Information in Powder Micrographs Using Pre-trained Convolutional Neural Networks: *Andrew Kitahara*[1]; Srujana Yarasi[1]; Ryan Cohn[1]; Keith Kozlosky[1]; Elizabeth Holm[1]; [1]Carnegie Mellon University

2:40 PM
Discontinuities in Additive Manufactured (L-PBF) Components - Influence on the Mechanical Properties: Christoph Weidig[1]; Christian Straube[1]; *Felix Gemse*[1]; [1]Günter-Köhler-Institute GmbH

3:00 PM
Interactions between Flaws, Microstructure, and Structural Properties in AM Metals: *Jay Carroll*[1]; Christopher Laursen[1]; Jody Bartanus[2]; Benjamin Smith[2]; Garrett Pataky[2]; [1]Sandia National Laboratories; [2]Clemson University

3:20 PM Break

3:40 PM
Room Temperature Time Dependent Deformation in Small Springs: *Lisa Deibler*[1]; John Laing[1]; Christopher Finfrock[1]; Aron Robbins[1]; [1]Sandia National Laboratories

4:00 PM
Microstructure Characterization of Titanium Following Electrified Taylor Anvil Impact Tests: *Jonathan Ligda*[1]; Matthew Coppinger[1]; [1]US Army Research Laboratory

4:20 PM
Microstructural Evolution and Nanoindentation Study of the Mechanical Properties of MWCNT-Ti6Al4V Nanocomposites: *Avwerosuoghene Okoro*[1]; Senzeni Lephuthing[1]; Ronald Machaka[1]; Peter Olubambi[1]; [1]University of Johannesburg, South Africa

4:40 PM
Grain Boundary Morphology Evolution in Low Cycle Fatigue of High Purity Aluminum: *Xueqiao Wang*[1]; Wade Lanning[1]; Christopher Muhlstein[1]; Joshua Kacher[1]; [1]Georgia Institute of Technology

5:00 PM
HRDIC and EBSD Study of Slip-band Behavior: *David Fullwood*[1]; Ryan Sperry[1]; Eric Homer[1]; Robert Wagoner[2]; Joao Quinta da Fonseca[3]; [1]Brigham Young University; [2]Ohio State University; [3]University of Manchester

Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials — 2D Nanomaterials & Polymer-derived Ceramics

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

Wednesday PM
October 2, 2019

Room: D134
Location: Oregon Convention Center

Session Chairs: Kathy Lu, Virginia Tech; Michael Naguib, Tulane University

2:00 PM Invited
Oxidation and Stabilization of 2D MXene Nanosheets: Xiaofei Zhao[1]; Touseef Habib[1]; Evan Prehn[1]; Aniruddh Vashisth[1]; Smit Shah[1]; Yexiao Chen[1]; Zeyi Tan[1]; Jodie Lutkenhaus[1]; Miladin Radovic[1]; *Micah Green*[1]; [1]Texas A&M University

2:30 PM
Facile and Scalable Fabrication of Free-standing Reticulated 3D Graphene Foam via Freeze Drying: *Tony Thomas*[1]; Xiaolong Lu[1]; Benjamin Boesl[1]; Arvind Agarwal[1]; [1]Florida International University

2:50 PM
Two-dimensional Titanium Carbonitride MXene as Electrocatalyst for Hydrogen Evolution Reaction: Kun Liang[1]; Anika Tabassum[1]; *Michael Naguib*[1]; [1]Tulane University

3:10 PM
3-D Assembled MnO2 Nanosheets and Conversion to Tunnel-structured MnO_2: *Scott Misture*[1]; Peter Metz[1]; Madeleine Flint[1]; Robert Koch[1]; Alec Ladonis[1]; Peng Gao[1]; [1]Alfred University

3:30 PM Break

3:50 PM
Nanocomposites TiO2-layered Hydroxides. Structure and Photocatalytic Decomposition of Vanillin and Methyl Orange: *Andrei Jitianu*[1]; Thomas Haughey[2]; Naphtali O'Connor[1]; Edruce Edouarzin[1]; Mihaela Jitianu[2]; [1]Lehman College, City University of New York; [2]William Paterson University

4:10 PM
Defect Effects on the Enhanced Photocatalytic Properties of 2D MoO_3 Nanoflakes: *Haitao Zhang*[1]; Soheil Razmyar[1]; [1]University of North Carolina at Charlotte

4:30 PM
Polymer Intercalation Synthesis of GlycoBoehmite Nanosheets: *Nelson Bell*[1]; Mark Rodriguez[1]; Jessica Kruichak[1]; Bernadette Hernandez[1]; Igor Kolesnichenko[1]; Paul Kotula[1]; Edward Matteo[1]; [1]Sandia National Laboratories

4:50 PM
Oxygen Vacancies in Nanostructured Metal-oxide Gas Sensors: *Mohamad Al-Hashem*[1]; Sheikh Akbar[1]; Patricia Morris[1]; [1]Ohio State University

Corrosion of Additively Manufactured Metals — Corrosion of Additively Manufactured Metals II

Program Organizers: Eric Schindelholz; Rajeev Gupta, The University of Akron; Ajit Mishra, Haynes International; Amit Pandey, Ansys/Granta Design

Wednesday PM
October 2, 2019

Room: B112
Location: Oregon Convention Center

Session Chairs: Eric Schindelholz, Sandia National Laboratories; Rajeev Gupta, University of Akron

2:00 PM Invited
Electrochemical Characterization of Additively Manufactured Al-10Si-Mg in Standardized Test Solutions: *Robert Kelly*[1]; Gregory Kubacki[1]; [1]University of Virginia

2:20 PM
Surface Damage of an AM-AlSi10Mg Alloy Exposed to Corrosive Environments with Lack of Fusion Defects and Powder Contamination: *Holly Martin*[1]; Daniel Bogen[1]; Varthula De Silva Jayasekera[1]; Brett Conner[1]; [1]Youngstown State University

2:40 PM
Corrosion Performance of Aluminium Based Functionally Graded Materials Processed by Wire-arc Additive Manufacturing: *Amin S. Azar*[1]; Martin Sunding[1]; Nicky Tzima[2]; Spyros Diplas[1]; Angeliki Lekatou[2]; Spyros Kleftakis[2]; [1]SINTEF; [2]University of Ioannina

3:00 PM
Development of Wire Arc Additively Manufactured AZ 91 Alloy for Remarkable Improvement in Corrosion Resistance: *Abhishek Tiwari*[1]; Saravanan Seman[1]; A. Raja[1]; Gaurav Singh[1]; Racholsan Raj Nirmal[1]; Mookara Rama Kishore[1]; Murugaiyan Amirthalingam[1]; R. Jayaganthan[1]; [1]IIT Madras

3:20 PM Break

3:40 PM
High Temperature Oxidation and Creep Oxidation of Compositionally Graded Alloys in Air and Supercritical CO_2: Modeling and Experiment: *Christopher Taylor*[1]; Brett Tossey[1]; Stephen Niezgoda[2]; Yunzhi Wang[2]; [1]Dnv Gl; [2]Ohio State University

4:00 PM
High Temperature Oxidation of 718 Alloy Produced by Additive Manufacturing: *Tom Sanviemvongsak*[1]; Daniel Monceau[1]; [1]CIRIMAT

4:20 PM
The Effects of Laser Peening Parameters on the Corrosion and Hardness Properties of Ti6Al4V Alloy: Sharlotte Kubjane[1]; *Nana Arthur*[2]; Bathusile Masina[2]; Patricia Popoola[1]; Sisa Pityana[2]; [1]Tshwane University of Technology; [2]Council for Scientific and Industrial Research

Crosscutting Issues in Corrosion of Materials: Control, Monitoring, Mitigation and Material Selection — Crosscutting Corrosion Technologies

Program Organizers: Matthew Asmussen, Pacific Northwestern National Laboratory; Jeff Binns, Nuclear Waste Management Organization; James Neeway, Pacific Northwest National Laboratory; John Zhang, Gamry Instruments; Mary Lyn Lim, PPG; Sudhakar Mahajanam, Pinnacle ART; Eric Schindelholz, Sandia National Laboratories; Ajit Mishra, Haynes International; James Noel, Western University; Guang-Ling Song, Xiamen University; David Shoesmith, Western University; Raul Rebak, General Electric Global Research

Wednesday PM
October 2, 2019

Room: B119
Location: Oregon Convention Center

Session Chair: Mary Lyn Lim, PPG Industries

2:00 PM
Application of Impedance-scanning Electrochemical Quartz Crystal Microbalance in Film Formation and Conversion on Silver: *Xueyuan Zhang*[1]; [1]Gamry Instruments

2:20 PM
In Situ Raman Characterization of Aqueous Corrosion Processes: *Anna Reuter*[1]; Jaime George[2]; Joseph Ryan[2]; [1]Hermiston High School; [2]Pacific Northwest National Laboratory

2:40 PM
Investigating the Transport Mechanisms Governing the Oxidation of Hastelloy BC-1 by In Situ ToF-SIMS: Jeffrey Henderson[1]; Antoine Seyeux[2]; Sandrine Zanna[2]; Mark Biesinger[3]; David Shoesmith[1]; Philippe Marcus[2]; *James Noel*[1]; [1]The University of Western Ontario; [2]Chimie ParisTech; [3]Surface Science Western

3:00 PM
Electrochemical Sensors for Multiphase Environments: *Malgorzata Ziomek-Moroz*[1]; Timothy Duffy[2]; Derek Hall[2]; Serguei Lvov[2]; [1]National Energy Technology Laboratory; [2]Pennsylvania State University

3:20 PM Break

3:30 PM
Materials Corrosion in Hot Dilute Acidic Pre-hydrolysis Biorefining Conditions: *Yimin Zeng*[1]; Minkang Liu[2]; Jing-li Luo[2]; [1]NRCan, Canada; [2]University of Alberta

3:50 PM
Reduction of Microbiologically Induced Corrosion (MIC) in a Seawater Injection Plant Utilizing DNA-based Molecular Technologies: *Hameed Al-Hashem*[1]; Shabbir Mukadam[1]; Maqsood Dabir[1]; Morten Poulsen[2]; Thomas Lundgaard[3]; [1]PRC-KISR; [2]Danish Technological Institute ; [3]Danish Technological Institute

4:10 PM
Corrosion Behaviour and Inhibition of Aluminium Alloy in Coconut Shell/ H2SO4 Solution: *Omotayo Sanni*[1]; Popoola Patricia[1]; Fayomi Osi[1]; [1]Tshwane University of Technology

Emergent Materials under Extremes and Decisive In-situ Characterizations — Materials under Irradiation and Beyond

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

Wednesday PM
October 2, 2019

Room: E145
Location: Oregon Convention Center

Session Chairs: Maik Lang, The University of Tennessee, Knoxville; Xiaofeng Guo, Washington State University

2:00 PM Invited
Exploring Radiation Resistance of Metal/Carbon Interface by In-situ Heavy Ion Irradiated Study: *Yue Liu*[1]; Jin Li[2]; Pengzheng Tang[1]; Tongxiang Fan[1]; [1]Shanghai Jiao Tong University; [2]Purdue University

2:30 PM Invited
Interface Design for Radiation Resistant Metallic Nanocomposites: *Youxing Chen*[1]; Jian Wang[2]; Xinghang Zhang[3]; [1]University of North Carolina at Charlotte; [2]University of Nebraska–Lincoln; [3]Purdue University

3:00 PM
Non-destructive Multi-property Determination under Extreme Conditions with Transient Grating Spectroscopy: *Cody Dennett*[1]; Khalid Hattar[2]; Michael Short[1]; [1]Massachusetts Institute of Technology; [2]Sandia National Laboratories

3:20 PM Break

3:40 PM
Self-organization of Gas Bubbles in Materials under Irradiation: *Cheng Sun*[1]; [1]Idaho National Laboratory

4:10 PM Invited
Switchable In-plane Ferroelectricity in Quasi-2D Oxide: *Jie Jiang*[1]; Lifu Zhang[1]; Jing Feng[2]; Jian Shi[1]; [1]Rensselaer Polytechnic Institute; [2]Kunming University of Science and Technology

4:40 PM Panel Discussion

Failure Analysis & Characterization — Fatigue & Failure II

Program Organizers: Andrew Havics, PH2 LLC; James Lane, Rimkus Consulting Group Inc; Burak Akyuz, Applied Technical Services Inc; Pierre Dupont, UMONS, Faculté Polytechnique de MONS (FPMs)

Wednesday PM
October 2, 2019

Room: F150
Location: Oregon Convention Center

Session Chairs: Erhan Ulvan, Acuren Group Inc.; Robert O'Shea, Engineering Systems Inc; Daniel Baker, General Motors; Pierre Dupont, Schaeffler Belgium Sprl/bvba

2:00 PM
Fatigue Crack Threshold Analysis with TiAl SENT and CC Specimens – Influence of Starter Notch and Pre-cracking: *Sven Eck*[1]; Jürgen Maierhofer[1]; Christian Tritremmel[1]; Stefan Marsoner[1]; Nigel Martin[2]; [1]Materials Center Leoben Forschung GmbH; [2]Rolls-Royce plc

2:20 PM
The Influence of Monotonic Damage on Metal Fatigue at High Stress-ratios: *Peter Huffman*[1]; [1]John Deere

2:40 PM
The Effect of Microstructural Features and Composition on the Damage Behaviour of Tool Steels: *Alexandra Rose*[1]; Robyn Marentette[1]; Daniel Green[1]; Ahmet Alpas[1]; [1]University of Windsor

3:00 PM
Comparative Analysis of Convertor Tubes Failed due to Thermo-mechanical Fatigue and Creep: *Kaushal Kishore*[1]; Manashi Adhikary[1]; Goutam Mukhopadhyay[1]; Sandip Bhattacharyya[1]; [1]Tata Steel Limited

3:20 PM Break

3:40 PM
Failure Analysis and Remaining Life Assessment of Reformer Outlet Manifold: *Abdulmohsen Alsahli*[1]; [1]Saudi Basic Industries Corp. (Sabic)

4:00 PM
Torsional Fatigue Failure of Pump Shaft of a Gas Cleaning Plant(GCP) in Blast Furnace: *Ankita Roy*[1]; [1]Tata Steel

4:20 PM
Brittle Crack Arrest Behavior of a Heavy-gauge Steel Plate: *Ohjae Lee*[1]; Seok Gyu Lee[1]; H.Y. Bae[2]; H.C. Jeong[2]; S.H. Lee[1]; N.J. Kim[1]; [1]POSTECH; [2]POSCO

Failure Analysis: Industry Specific Failures — Process-Related Failures

Program Organizers: Andrew Havics, PH2 LLC; James Lane, Rimkus Consulting Group Inc; Burak Akyuz, Applied Technical Services Inc; Pierre Dupont, UMONS, Faculté Polytechnique de MONS (FPMs)

Wednesday PM
October 2, 2019

Room: F151
Location: Oregon Convention Center

Session Chairs: Veronique Vitry, UMONS; Charles White, Kettering University; Joel Davis, Rolls-Royce Corporation

2:00 PM
Failure Analysis on Cracked Outlet Nozzles (2 off) from a Regeneration Gas Heater Economizer: *Riza Khan*[1]; Kavir Ramdass[1]; [1]In-Corr-Tech Ltd.

2:20 PM
Cracking of a Heavy Dump Tractor Trailer Resulted from the HDG Process: *Martin Lazarek*[1]; [1]Pario Engineering and Environmental Sciences

2:40 PM
Effect of Ti on Grain Refinement and Torsional Fatigue of Microalloy Steel: *Navinkumar Bitla*[1]; Shrikant Jadhav[1]; Vinayak Pawar[1]; [1]Bharat Forge Limited – Kalyani Centre for Technology & Innovation (KCTI)

3:00 PM
Failure Analysis of Industrial Products and Components: From Identification to Process Based Approach: *George Pantazopoulos*[1]; Athanasios Vazdirvanidis[1]; Anagnostis Toulfatzis[1]; Sofia Papadopoulou[1]; Andreas Rikos[1]; [1]ELKEME - Hellenic Research Centre for Metals S.A.

3:20 PM
Doomed ! Parts That Have Made It through Quality Control That Shouldn't: *Véronique Vitry*[1]; Fabienne Delaunois[1]; [1]UMONS

3:40 PM Break

4:00 PM
Does Punching Affect Forming of Blanks?: *Erhan Ulvan*[1]; [1]Acuren Group Inc.

4:20 PM
Hydrogen Embrittlement Case Studies: Contributions from Material Processing: *Dan Grice*[1]; Larry Hanke[1]; [1]Materials Evaluation and Engineering Inc

4:40 PM
Comparing Inherent Damping Capability of Additively Manufactured Stainless 316L and Inconel 718: *Onome Scott-Emuakpor*[1]; Tommy George[1]; Brian Runyon[1]; Joseph Beck[1]; [1]Air Force Research Laboratory

5:00 PM
Cutting Inserts Wear Monitoring in AISI 1045 Dry Longitudinal Turning through Cutting Forces: a Case Study: *Lucas Equeter*[1]; Robin Devlamincq[1]; François Ducobu[1]; Clément Dutoit[1]; Pierre Dehombreux[1]; [1]University of Mons

Glasses, Optical Materials, and Devices: Current Issues in Science & Technology — Advances in Understanding Glassy State and Glass Transition

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

Wednesday PM
October 2, 2019
Room: A106
Location: Oregon Convention Center

Session Chairs: John Mauro, Pennsylvania State University; Pierre Lucas, University of Arizona

2:00 PM Invited
Fluctuations in Glass-forming Systems: *John Mauro*[1]; [1]The Pennsylvania State University

2:30 PM Invited
Fragile-to-Strong Transitions in Glass Forming Liquids: *Pierre Lucas*[1]; [1]University of Arizona

3:00 PM
Rheological Characterization of Calcium- and Iron-rich Silicate Slags during Solidification: Christopher Giehl[1]; Mario Kleindienst[1]; *Daniela Ehgartner*[1]; [1]Anton Paar

3:20 PM Break

3:40 PM Invited
Rheology of Glass-forming Liquids as a Probe of the Energy Landscape: *Sabyasachi Sen*[1]; [1]University of California, Davis

4:10 PM Invited
Accessing New Glassy States via Pressure Processing: *Liping Huang*[1]; [1]Rensselaer Polytechnic Institute

4:40 PM Invited
Ultrafast Glass Science – Fundamentals and Applications: *S. K. Sundaram*[1]; [1]Alfred University

5:10 PM
Is λ-transition in Liquid Sulfur a Fragile-to-Strong Transition?: *Bing Yuan*[1]; Bruce Aitken[2]; Sabyasachi Sen[1]; [1]University of California, Davis; [2]Corning Inc.

Global Young Investigators Forum — Global Young Investigator's Forum: Session II

Program Organizers: Kathleen Shugart Cissel, UES Inc; Victoria Christensen, University of California Santa Barbara

Wednesday PM
October 2, 2019
Room: A109
Location: Oregon Convention Center

Session Chair: Victoria Christensen, University of California,Santa Barbara

2:00 PM
Analysis of the Mechanical Strength and Failure Mode of Undoped and Aluminum Titanate (Al_2TiO_5, ALT) Doped Ni-YSZ Solid Oxide Fuel Cell Anodes under Uniaxial and Biaxial Strength Testing Conditions: *Madisen Mccleary*[1]; [1]Montana State University

2:20 PM
Electrode Engineering of 3D Self-architectured Cathode in Proton-conducting Solid Oxide Fuel Cells at Reduced Temperatures: *Wenjuan Bian*[1]; Wei Wu[1]; Hanping Ding[1]; Dong Ding[1]; [1]Idaho National Laboratory

2:40 PM
Quantifying the Nature and Impact of Multi-scale Microstructure Heterogeneities in SOFC Electrodes: *Rubayyat Mahbub*[1]; William K Epting[2]; Tim Hsu[1]; Gregory A Hackett[2]; Harry Abernathy[2]; Shawn Litster[1]; Anthony D Rollett[1]; Paul A Salvador[1]; [1]Carnegie Mellon University; [2]U.S. DOE National Energy Technology Laboratory

3:00 PM
Rational Anode Design for Protonic Ceramic Fuel Cells by a One-step Phase Inversion Method: *Jun Gao*[1]; Yuqing Meng[1]; Tao Hong[1]; Sungkyu Kim[1]; Shiwoo Lee[2]; Kai He[1]; Kyle Brinkman[1]; [1]Clemson University; [2]National Energy Technology Laboratory

3:20 PM
High Performance Roll-to-roll Printed PTB7-Th:PC_{71}BM Organic Solar Cells Enabled by Rapid Additive Removal: *Thomas Colburn*[1]; [1]Stanford University

Grain Boundaries, Interfaces, and Surfaces in Functional Materials: Fundamental Structure-Property-Performance Relationships — Interface Evolution During Materials Processing and Deformation

Program Organizers: Ming Tang, Rice University; Shen Dillon, University of Illinois, Urbana-Champaign; John Blendell, Purdue University; Wayne Kaplan, Technion - Israel Institute of Technology

Wednesday PM
October 2, 2019
Room: E143
Location: Oregon Convention Center

Session Chairs: Edwin Garcia, Purdue University; Wolfgang Rheinheimer, Purdue University

2:00 PM Invited
Intrinsic Properties of Domain Walls in Ferroelectric Heterostructures: *Xiaoqing Pan*[1]; [1]University of California, Irvine

2:30 PM Invited
Electric Field Effects on Grain Boundary Core Structures: *Klaus Van Benthem*[1]; [1]University of California, Davis

3:00 PM Invited
Flash Sintering and Field Assisted Grain Growth in Perovskite Oxides: *Wolfgang Rheinheimer*[1]; Xin Phuah[1]; Han Wang[1]; Jan Preusker[1]; Haiyan Wang[1]; [1]Purdue University

3:30 PM Break

3:50 PM
Mechanisms of "Strain-annealed" Grain Boundary Engineering in Hastelloy-X: *Etienne Martin*[1]; Andrew Detor[2]; Daniel Wei[1]; Ian Spinelli[2]; [1]University of Waterloo; [2]GE Global Research

4:10 PM
Structure of the Martensitic Twin Interface and Relevance to Fatigue-activated Slip in Shape Memory Alloys: *Ahmed Sameer Khan Mohammed*[1]; Huseyin Sehitoglu[1]; [1]Mechanical Science and Engineering, University of Illinois Urbana-Champaign

4:30 PM
Sub-surface Measurements of the Austenite Microstructure in Response to Martensitic Phase Transformation: *Ashley Bucsek*[1]; Hanus Seiner[2]; Hugh Simons[3]; Phil Cook[4]; Can Yildirim[4]; Yuriy Chumlyakov[5]; Carsten Detlefs[4]; Aaron Stebner[6]; [1]University of Minnesota; [2]Academy of Sciences of the Czech Republic; [3]Technical University of Denmark; [4]European Synchrotron Radiation Facility; [5]Tomsk State University; [6]Colorado School of Mines

4:50 PM
Continuum Dislocation Dynamics-based Grain Fragmentation Modeling: *Georges Ayoub*[1]; Ali Kobaissya[2]; Laszlo Toth[3]; Mu'Tasem Shehadeh[2]; Samir Mustapha[2]; [1]University of Michigan; [2]American University of Beirut ; [3]Université Paul Verlaine Metz

5:10 PM
Grain Boundary Sliding and Low Friction in Metals: *Michael Chandross*[1]; John Curry[1]; Tomas Babuska[2]; Adam Hinkle[1]; Nicolas Argibay[1]; [1]Sandia National Laboratories; [2]Lehigh University

Hybrid Organic-Inorganic Materials for Alternative Energy — Hybrids for Alternative Energy I

Program Organizers: Andrei Jitianu, Lehman College, City University of New York; Lisa Klein, Rutgers University; Lia Stanciu, Purdue University; Mihaela Jitianu, William Paterson University

Wednesday PM
October 2, 2019

Room: E147
Location: Oregon Convention Center

Session Chair: Kian Wai Tan, Toyohashi University of Technology

2:00 PM Invited
Responsive Wrinkles on Hybrid Gels/Hydrogels for Micro Soft Actuators: *Masahide Takahashi*[1]; [1]Osaka Prefecture University

2:30 PM Invited
Impact-adaptive Conductive Composite: *Yue (Jessica) Wang*[1]; Victor Hernandez[1]; [1]University of California, Merced

3:00 PM
Property Forecasting to Accelerate Computational Design of Kinematically Active Multifunctional MOFs for Energy Applications: Weiyi Zhang[1]; Chengxi Yang[2]; Alan Fern[2]; Seyed Aria Hosseini[1]; Matt Campbell[2]; *Alex Greaney*[1]; [1]University of California, Riverside; [2]Oregon State University

3:20 PM Break

3:30 PM Invited
Understanding Photophysics of Organic Materials: Towards Stable and Sustainable Materials for (Opto)Electronics: *Oksana Ostroverkhova*[1]; [1]Oregon State University

4:00 PM Invited
Inorganic-organic Hybrid Materials for Polymer Electrolyte and Alkaline Fuel Cells: *Kiyoharu Tadanaga*[1]; [1]Hokkaido University

4:30 PM Invited
Interactions between Electrocatalyst, Carbon, and Electrolyte during Oxygen Electrocatalysis: *Kelsey Stoerzinger*[1]; [1]Oregon State University

5:00 PM
Blister Formation and the Degradation of Organic Light Emitting Devices: *Oluwaseun Oyewole*[1]; Jaya Cromwell[1]; Deborah Oyewole[1]; Reisya Ichwani[1]; Winston Soboyejo[1]; [1]Worcester Polytechnic Institute

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

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

Wednesday PM
October 2, 2019

Room: G132
Location: Oregon Convention Center

Session Chairs: Amy Clarke, Colorado School of Mines; Levente Balogh, Queen's University

2:00 PM Invited
Fluctuations in Plasticity and the Intermittent-to-smooth-transition in Microplasticity: *Robert Maass*[1]; [1]University of Illinois at Urbana-Champaign

2:30 PM Invited
New Insights into Metallic Alloy Microstructural Evolution by In-situ Characterization: *Amy Clarke*[1]; Jonah Klemm-Toole[1]; Yaofeng Guo[1]; Damien Tourret[2]; Seth Imhoff[3]; Benjamin Ellyson[1]; Alec Saville[1]; John Copley[1]; Brian Milligan[1]; Chloe Johnson[1]; John Roehling[4]; Joseph McKeown[4]; Niranjan Parab[5]; Kamel Fezzaa[5]; Tao Sun[5]; Sven Vogel[3]; Tresa Pollock[6]; Alain Karma[7]; [1]Colorado School of Mines; [2]IMDEA; [3]Los Alamos National Laboratory; [4]Lawrence Livermore National Laboratory; [5]Argonne National Laboratory; [6]University of California Santa Barbara; [7]Northeastern University

3:00 PM
Multiscale Modeling and Experimental Validation of the Mechanical Properties of Alloyed Nano Foams: *Ioannis Mastorakos*[1]; Hang Ke[1]; Andres Jimenez[1]; Cetin Cetinkaya[1]; David Bahr[2]; [1]Clarkson University; [2]Purdue University

3:20 PM Break

3:40 PM Invited
Measuring the Multiaxial Nature of Thermomechanical Constitutive Relationships of Crystalline Materials: *Aaron Stebner*[1]; [1]Colorado School of Mines

4:10 PM Invited
Irradiation Defects in Zr Alloys: A Comparison between Transmission Electron Microscopy and Diffraction Line Profile Analysis: *Levente Balogh*[1]; Fei Long[1]; Zhongwen Yao[1]; Michael Preuss[2]; Mark Daymond[1]; [1]Queen's University; [2]The University of Manchester

4:40 PM
Crystal Plasticity Modeling the Deformation in Nanodomained Heterogeneous Structures: *Tianju Chen*[1]; Caizhi Zhou[1]; [1]Missouri University of Science and Technology

5:00 PM Invited
Behaviors of Crystalline Metals in Highly Dynamic Processes Revealed by High-speed Synchrotron X-ray Experiments: *Tao Sun*[1]; Kamel Fezzaa[1]; [1]Argonne National Laboratory

5:30 PM Invited
In-situ SEM Deformation Experiments to Fracture: An Effort to Overcome Crystal Plasticity-induced Roughening Effects: *C. Tasan*[1]; K. Briggs[1]; I. Nakahata[1]; J. Kang[1]; [1]Massachusetts Institute of Technology

International Symposium on Ceramic Matrix Composites — CMC II

Program Organizers: Narottam Bansal, National Aeronautics and Space Administration; Jacques Lamon, LMT-Cachan, CNRS; Sung Choi, Naval Air Systems Command; J. P. Singh, US Army Research Laboratory (Retired)

Wednesday PM
October 2, 2019

Room: A103
Location: Oregon Convention Center

Session Chairs: Frank Zok, University of California, Santa Barbara; Yutai Katoh, Oak Ridge National Laboratory

2:00 PM Invited
Deformation, Rupture and Sliding of Fiber Coatings in Ceramic Composites: *Frank Zok*[1]; Evan Callaway[1]; Paul Christodoulou[1]; [1]University of California, Santa Barbara

2:40 PM
Engineered Microcracks in Ceramic Metamaterials: *Ryan Cooper*[1]; [1]University of Connecticut

3:00 PM Invited
Silicon Carbide-based CMC for Nuclear Applications – Opportunities and Challenges: *Yutai Katoh*[1]; [1]Oak Ridge National Laboratory

3:40 PM Break

4:00 PM
Zirconium Carbide/Refractory Metal Composites Produced by the Displacive Compensation of Porosity (DCP) Process: *Mario Caccia*[1]; Christopher Morrissey[1]; Camilla McCormack[1]; Alexander Strayer[1]; Gregory Scofield[1]; Kenneth Sandhage[1]; [1]Purdue University

4:20 PM
Synthesis of Net Shaped SiC-TiB2 Composites with Melt Infiltration: *Corson Cramer*[1]; Richard Lowden[1]; [1]Oak Ridge National Laboratory

Joining of Advanced and Specialty Materials XXI — Welding Metallurgy / Steel Welding II

Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee; Hiroaki Mori, Osaka University; Yuri Hovanski, Brigham Young University; Darren Barborak, WeldQC Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell; Zhenzhen Yu, Colorado School of Mines

Wednesday PM
October 2, 2019

Room: Portland Ballroom 252
Location: Oregon Convention Center

Session Chairs: Boian Alexandrov, The Ohio State University; Vikas Patel, ArcelorMittal USA

2:00 PM Invited
Computational Modeling of Weldability Tests for Quantification of Material-specific Properties Related to Weldability: *Boian Alexandrov*[1]; [1]Ohio State University

2:30 PM Invited
Weldability of HAYNES 244 Alloy – A New Low Thermal Expansion Alloy: *Jeremy Caron*[1]; Michael Fahrmann[1]; [1]Haynes International Inc

3:00 PM
Stress Relief and Service Age Cracking in Austenitic Stainless Steels and Nickel Based Superalloys: *Jonah Duch*[1]; John DuPont[1]; [1]Lehigh University

3:20 PM Invited
Weld Seam Characteristics of Roll Formed TRIP690 Tubes: *Alexander Bardelcik*[1]; Bharathwaj Ananthapillai[1]; [1]University of Guelph

3:50 PM Break

4:10 PM
High Frequency Ultrasonic Resistance Spot Joining of Advance High Strength TRIP 780 Steel.: *Umair Shah*[1]; Xun Liu[1]; [1]The Ohio State University

4:30 PM
Chemistry Sensitive Modelling of the Microstructure Evolution in the HAZ of Line Pipe Steels: *Nicolas Romualdi*[1]; Matthias Militzer[1]; Warren Poole[1]; Laurie Collins[2]; Robert Lazor[3]; [1]University of British Columbia; [2]Evraz, Inc.; [3]TransCanada PipeLines Ltd.,

4:50 PM
Phase Transformations and Mechanical Properties of a 10 wt% Ni Steel Welding Consumable: *Erin Barrick*[1]; John DuPont[1]; [1]Lehigh University

5:10 PM
A Study on Effect of Multi-passes on the Microstructures and Mechanical Properties of AISI-1045 Weldment: *Fahad Riaz*[1]; Muhammad Kamran[1]; Tahir Ahmad[1]; Faraz Hussain[1]; Muhammad Umer Manzoor[1]; [1]University Punjab Lahore

Journal of the American Ceramic Society Awards Symposium — JACerS Award Symposium Session II

Program Organizer: William Fahrenholtz, Missouri University of Science and Technology

Wednesday PM
October 2, 2019

Room: A107
Location: Oregon Convention Center

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

2:00 PM Invited
Electronic Structure and Mechanical Properties of a Large Realistic Model of Inter-granular Glassy Film in ß-Si3N4: *Wai-Yim Ching*[1]; [1]University of Missouri

2:30 PM Invited
High-strength, Light-weight and Printable Ceramic Foams with Hierarchical Pore Structure from Boehmite Foams: Xiaoyan Zhang[1]; *Wenlong Huo*[1]; Yugu Chen[1]; Jinlong Yang[1]; [1]Tsinghua University

3:00 PM Invited
Thermochemical Model on the Carbothermal Reduction of Oxides During Spark Plasma Sintering of Zirconium Diboride: David Pham[1]; J Dycus[2]; James LeBeau[2]; Krishna Muralidharan[1]; Venkateswara Rao Manga[1]; *Erica Corral*[1]; [1]The University of Arizona; [2]North Carolina State University

3:30 PM Break

3:50 PM Invited
The Future of Grain Boundary Complexion Engineering: *Amanda Krause*[1]; Patrick Cantwell[2]; Christopher Marvel[3]; Charles Compson[4]; Jeffrey Rickman[3]; Martin Harmer[3]; [1]University of Florida; [2]Rose–Hulman Institute of Technology; [3]Lehigh University; [4]Almatis, Inc

4:20 PM Invited
Fabrication and Properties of Transparent Nd-doped BaF2 Ceramics: *Yiquan Wu*[1]; Jianlin Li[2]; Xianqiang Chen[1]; [1]Alfred University; [2]Hainan University

4:50 PM Invited
New Advanced Sintering Approaches Based on Spark Plasma Sintering: *Charles Maniere*[1]; Geuntak Lee[2]; Elisa Torresani[2]; Claude Estournes[3]; Eugene A. Olevsky[2]; [1]Laboratoire CRISMAT; [2]Powder Technology Laboratory; [3]CIRIMAT

5:20 PM Invited
Sintering Forces Acting among Particles during Sintering by Grain Boundary/Surface Diffusion: *Fumihiro Wakai*[1]; Gaku Okuma[1]; Norimasa Nishiyama[1]; Olivier Guillon[2]; [1]Tokyo Institute of Technology; [2]Research Center Juelich

5:50 PM Invited
Sinter-cracking: Simulations and Experiments: *Joseph Carazzone*[1]; Michael Bonar[2]; Henry Baring[1]; Mark Cantu[1]; Zachary Cordero[1]; [1]Rice University; [2]U.S. Army Research Laboratory

Light Metal Technology — Processing Technology I

Program Organizers: Xiaoming Wang, Purdue University; Alan Luo, Ohio State University; Kumar Sadayappan, Canmet MATERIALS

Wednesday PM
October 2, 2019

Room: D138
Location: Oregon Convention Center

Session Chair: Kumar Sadayappan, Canmet Materials

2:00 PM Invited
Design of an Experimental Die to Assess the Mechanical Properties of a HPDC Casting with High Flow Length within the Framework of an Internet of Production: *Maximilian Rudack*[1]; Andreas Bührig-Polaczek[1]; Uwe Vroomen[1]; [1]Foundry Institute RWTH Aachen University

2:20 PM
Precipitation of Scandium-Containing Dispersoids in an Al-Mg-Si (Cu) 6xxx Series Alloy: *Timothy Langan*[1]; Avishan Arabshomali[2]; Thomas Wood[2]; Paul Sanders[2]; [1]Cleanteq; [2]Michigan Technological University

2:40 PM
Development of a Hot Tear Test Procedure for Aluminum Casting Alloys: *Kumar Sadayappan*[1]; Amanda Maia Aguiar Aguiar[2]; Xiaochun Zeng[2]; Sumanth Shankar[2]; [1]Canmet Materials; [2]Light Metal Casting Research Centre (LMCRC)

3:00 PM Invited
Effect of Quench-rate during Solution Treatment on the Precipitation Behaviors of Al-Zn-Mg-Cu Alloy with an Addition of Ti Element: *Kwangjun Euh*[1]; Saif Kayani[1]; Jae-Gil Jung[1]; Min-Seok Kim[1]; Sang-hwa Lee[1]; In-ho Jung[2]; [1]Korea Institute of Materials Science; [2]Seoul National University

3:20 PM Break

3:40 PM
Prediction of Fluidity of Casting Aluminum Alloys Using Artificial Neural Network: Yuan Gao[1]; Hengcheng Liao[1]; Xiaojing Suo[1]; *Qigui Wang*[2]; [1]School of Materials Science and Engineering, Southeast University; [2]Materials Technology, GM Global Propulsion Systems

4:00 PM
Optimizing T61 Heat Treatment for LPDC Cast Aluminium Alloys: *Engin Kilinc*[1]; [1]CMS Jant ve Makina Sanayii - CMS Wheels

4:20 PM
Effect of Rolling Method on Microstructural Evolution during Recrystallization in Cold Rolled AA1100: *Shi Hoon Choi*[1]; Min-Seong Kim[1]; Seong-Eum Lee[1]; Amol Kale[1]; Sang-Chul Kwon[2]; Sun-Tae Kim[2]; Hyo-Tae Jeong[2]; Jaiveer Singh[1]; [1]Sunchon National University; [2]Gangneung-Wonju National University

4:40 PM
Solidification, Microstructure and Mechanical Properties of Cast Al-Ni-Mn Alloys: *Jiao Fang*[1]; Shouxun Ji[1]; [1]Brunel University, London

5:00 PM
Investigation on Heat Treatment Characteristics of Carbon Nanotubes Reinforced 7075 Aluminum Matrix Composites: *Li Xing*[1]; Liming Ke[1]; Qiang Liu[1]; [1]NanChang HangKong University

Nanostructured Materials under Extreme Environments — Materials under Radiation, High-temperature, and Other Extreme Environments

Program Organizers: Jin Li, Purdue University; Assel Aitkaliyeva, University of Florida; Youxing Chen, University of North Carolina at Charlotte; Yue Liu, Shanghai Jiao Tong University; Shuai Shao, Louisiana State University

Wednesday PM
October 2, 2019

Room: D133
Location: Oregon Convention Center

Session Chairs: Yue Liu, Shanghai JiaoTong University; Shuai Shao, Louisiana State University

2:00 PM Invited
Channeling Analysis for Palladium Implanted 4H–SiC and the Annealing Effects: *Di Chen*[1]; [1]University of Houston

2:30 PM Invited
Suppressing Void Swelling in NiCoFeCr High Entropy Alloy and Nanostructured High Entropy Alloys: *Zhe Fan*[1]; Tai-ni Yang[2]; Yuri Osetskiy[1]; Ke Jin[1]; Hongbin Bei[1]; Lumin Wang[2]; William Weber[3]; Yanwen Zhang[1]; [1]Oak Ridge National Lab; [2]University of Michigan; [3]University of Tennessee

3:00 PM
Mechanical Hardness and Microstructure of Nanostructured V-Y Alloys: *Anit Giri*[1]; Billy Hornbuckle[1]; AJ Roberts[1]; Albert Ostlind[2]; Blake Fullenwider[2]; Kris Darling[1]; [1]CCDEVCOM Army Research Laboratory; [2]ORAU

3:20 PM
A Thermodynamic Approach for Multi-solute Grain Boundary Segregation in Nanocrystalline Alloys: *Mostafa Saber*[1]; Ronald Scattergood[2]; Carl Koch[2]; [1]Oregon Institute of Technology; [2]North Carolina State University

3:40 PM Break

4:00 PM
True Thermal Stability in a Nanocrystalline Alloy: *B. Hornbuckle*[1]; Anthony Roberts[1]; Josh Smeltzer[2]; Anit Giri[1]; Kris Darling[1]; [1]U.S. Army Research Laboratory; [2]Lehigh University

4:20 PM Invited
Stress-assisted Structural Phase Transformation in Mo/Cu Bicontinuous Intertwined Composites: Lijie He[1]; *Niaz Abdolrahim*[1]; [1]University of Rochester

4:40 PM Invited
Pressure-induced Dramatic Changes of Halide Perovskites with Different Dimensionality: *Xujie Lu*[1]; [1]Center for High Pressure Science & Technology Advanced Research

5:00 PM
Science-based Advancement of Polymeric Materials for Hydrogen Technologies: *Kevin Simmons*[1]; Wenbin Kuang[1]; Nalini Menon[2]; Bart Smith[3]; [1]Pacific Northwest National Laboratory; [2]Sandia National Laboratory; [3]Oak Ridge National Laboratory

5:20 PM
Improving Solid-state Reaction and Electrochemical Performance of NaCrO2 Cathode for Na-ion Batteries through Mechanical Activation: *Mei Luo*[1]; Angel Ortiz[2]; Fangmin Guo[3]; Zhepu Shi[1]; Yang Ren[3]; Zonghai Chen[3]; Wei Chen[1]; Leon Shaw[1]; [1]Illinois Institute of Technology; [2]Universidad de Extremadura; [3]Argonne National Laboratory

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

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

Wednesday PM
October 2, 2019

Room: C126
Location: Oregon Convention Center

Session Chairs: Hang Yu, Virginia Polytechnic Institute and State University; Gary Pickrell, Virginia Tech; Navin Manjooran, Solve Technology and Research, Inc.

2:00 PM Keynote
Effect of CuO/MgO Ratio on the Gene Expression, Cytocompatibilty, and Antibacterial/Analgesic/ Anticancerous Drug Loading Kinetics for the Mesoporous Bioactive Glasses: *Gurbinder Kaur*; V. Kumar[1]; [1]Thapar University

2:40 PM
Inhibition of Gram-negative and Fungi Strains of Microbes Inducing Microbiologically-Influenced-Corrosion by Tectona grandis Capped Fe-Nanoparticle: *Joshua Okeniyi*[1]; Esther Akinlabi[2]; Stephen Akinlabi[2]; Elizabeth Okeniyi[2]; [1]Covenant University; [2]University of Johannesburg

3:00 PM
Modeling Dialium Guineense Mediated Zn-nanoparticle Growth Inhibition on Gram-positive Microbes Inducing Microbiologically-Influenced-Corrosion: *Joshua Okeniyi*[1]; Elizabeth Okeniyi[1]; Esther Akinlabi[2]; [1]Covenant University; [2]University of Johannesburg

3:20 PM
Nanaosensors to Build a Nervous System for the Planet: *Shobhan Paul*[1]; [1]Zetanostics Inc.

3:40 PM Break

4:00 PM
Nanostructured Aluminum Alloys for Power Generation Applications: *Anit Giri*[1]; AJ Roberts[1]; Billy Hornbuckle[1]; Scott Grendahl[1]; Kris Darling[1]; [1]CCDEVCOM Army Research Laboratory

4:20 PM
Preparation and Electrochemical Performance of CuS-CoS Double-layer Composite: *Yu Zhang*[1]; [1]Hubei University of Automotive Technology

4:40 PM
Ionic Transport in Alkali Intercalated C_{60} Molecular Solids: Applications for Electrochemical Energy Storage: *Rachel Gorelik*[1]; Venkateswara Manga[1]; Krishna Muralidharan[1]; [1]Department of Materials Science and Engineering, University of Arizona

5:00 PM Concluding Comments

Next Generation Biomaterials — Next Generation Biomaterials V

Program Organizers: Roger Narayan, University of North Carolina; Federico Rosei, INRS Centre for Energy, Materials and Telecommunications

Wednesday PM
October 2, 2019

Room: C122
Location: Oregon Convention Center

Session Chairs: Jae-Chul Pyun, Yonsei University; Jamiu Odusote , University of Ilorin

2:00 PM
Synthesis and Characterization of Hydroxyapatite from Eggshell for Biomedical Applications: *Jamiu Odusote*[1]; Ganiyat Odedele[1]; Toyeebah Abdullateef[2]; [1]University of Ilorin; [2]Offa and University of Ilorin

2:20 PM
Implantable 3D Polycaprolactone Nanocomposites Structures for Drug and Heat Delivery in the Localized Treatment of Breast Cancer: John Obayemi[1]; *Ali Salifu*[1]; Sandra Jusu[2]; Maria Chinyere Onyekanne[2]; Vahid Rahneshin[1]; Yiporo Danyuo[3]; Kwabena Kan-Dapaah[4]; Winston Soboyejo[1]; [1]Worcester Polytechnic Institute (WPI); [2]African University of Science and Technology; [3]Ashesi University; [4]University of Ghana

2:40 PM
In-vitro Prodigiosin Kinetics Release Studies from Polylactide-co-glycolide (PLGA) and Poly(ethylene glycol) (PEG) blend Microparticles for Controlled and Targeted Drug Delivery: *Sandra Jusu*[1]; John Obayemi[2]; Chukwudalu Nwazojie[1]; Ali Salifu[2]; Vanessa Uzonwanne[2]; Olushola Odusanya[3]; Winston Soboyejo[2]; [1]African University of Science and Technology; [2]Worcester Polytechnic Institute; [3]Biotechnology and Genetic Engineering Advanced Laboratory, Sheda Science and Technology Complex (SHESTCO)

3:00 PM
A Next Generation 3D Bioprinted Cardiac Patch with Human Cardiomyocytes and Fibroblasts: *Matthew Alonzo*[1]; Shweta Anil Kumar[1]; Munmun Chattopadhyay[2]; Yoshihiro Ito[3]; Stephanie Willerth[4]; Laura Suggs[5]; Binata Joddar[1]; [1]University of Texas at El Paso; [2]Texas Tech University Health Sciences Center; [3]RIKEN Custer for Pioneering Research; [4]University of Victoria; [5]The University of Texas at Austin

3:20 PM Break

3:40 PM
Structure, Properties and Synthesis of Silk, a Biocompatible Performance Material: Qijue Wang[1]; *Hannes Schniepp*[1]; [1]The College of William & Mary

4:00 PM Invited
Laser Desorption/Ionization (LDI) Mass SpectrometryBased on Nanomaterials: *Jae-Chul Pyun*[1]; Jong-Min Park[1]; Min-Jung Kang[1]; [1]Yonsei University

4:20 PM
Layer-by-layer Assembled Nanoparticle for Chemoradiation Treatment of Colorectal Cancer: *Justin Rosch*[1]; Madeleine Landry[1]; Conroy Sun[1]; [1]Oregon State University

4:40 PM
Mechanical and Thermal Properties of Superparamagnetic Magnetite-polycaprolactone Nanocomposites for Laser Hyperthermia and Ablation: John Obayemi[1]; *Maria Chinyere Onyekanne*[2]; Jingjie Hu[3]; Vahid Rahneshin[1]; Ali Salifu[1]; Kwabena Kan-Dapaah[4]; Winston Soboyejo[1]; [1]Worcester Polytechnic Institute (WPI); [2]African University of Science and Technology; [3]Princeton University; Mayo Clinic; [4]University of Ghana

Phase Transformations in Ceramics: Science and Applications — Prediction and Novel Methods I

Program Organizers: Pankaj Sarin, Oklahoma State University; Waltraud Kriven, University of Illinois at Urbana-Champaign; Sanjay Khare, University of Toledo; Yu Zhong, Worcester Polytechnic Institute

Wednesday PM
October 2, 2019

Room: A104
Location: Oregon Convention Center

Session Chair: Pankaj Sarin, Oklahoma State University

2:00 PM Invited
In-situ X-ray Characterization of Phase Evolution during Solid-state Synthesis of Multicomponent Systems: *Sanjit Ghose*[1]; [1]Brookhaven National Laboratory

2:30 PM Invited
Exploring 3-D Reciprocal Space: a Powerful Tool to Answer Basic and Applied Materials Science Questions at 33BM APS: *Evguenia Karapetrova*[1]; [1]Argonne National Laboratory

3:00 PM
Unraveling Stress-induced Structure Evolution in Functional Oxides using In-situ Neutron Diffraction: *Yan Chen*[1]; Ke An[1]; [1]Oak Ridge National Laboratory

3:20 PM Invited
Advances in Experimental Techniques for Investigating Microstructure Dependent Phase Transformations: *Raman Singh*[1]; Daniel Lowry[1]; Pankaj Sarin[1]; [1]Oklahoma State University

3:50 PM Break

4:10 PM Invited
Single Phase Spinel Produced from Powders of Alumina and Magnesia in Reactive Flash Sintering: *Rishi Raj*[1]; [1]University of Colorado

4:40 PM
Reactive Texturing of Yttria and Ceria TZP in a Strong Magnetic Field: *Omer Van Der Biest*[1]; Despoina Vriami[1]; [1]K U Leuven Department Mtm

5:00 PM
Investigations on the Glass Transition and Crystallisation Behavior of Glasses by Oscillatory Rheometry: Christopher Giehl[1]; Mario Kleindienst[1]; *Daniela Ehgartner*[1]; [1]Anton Paar

5:20 PM
Direct Conversion of Heat to Electricity using First-order Phase Transformations in Ferroelectrics: *Ashley Bucsek*[1]; William Nunn[1]; Bharat Jalan[1]; Richard James[1]; [1]University of Minnesota

Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals — Powder Metallurgy of Titanium, Aluminium, Magnesium and Calcium II

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

Wednesday PM
October 2, 2019

Room: D135
Location: Oregon Convention Center

Session Chairs: Biao Chen, Northwestern Polytechnical University; Peng Chen, University of Auckland

2:00 PM Keynote
Powder sintering involving TiH2: An Update Overview: *Gang Chen*[1]; Peng Cao[2]; Klaus-Dieter Liss[3]; Graeme Auchterlonie[4]; Xuanhui Qu[1]; [1]University of Science and Technology Beijing; [2]The University of Auckland; [3]Israel Institute of Technology; [4]The University of Queensland

2:40 PM
Development of Magnesium and Magnesium Alloy Materials through Press and Sinter Powder Processing: *Steven Johnson*[1]; Jason Alvarez[1]; [1]Central Connecticut State University

3:00 PM Invited
Strong and Ductile Novel Aluminium Metal Matrix Composites Reinforced with Ex-situ Carbon Nanotubes and In-situ Alumina Nanoparticles: *Biao Chen*[1]; Katsuyoshi Kondoh[2]; [1]Northwestern Polytechnical University; [2]Osaka University

3:30 PM Break

3:50 PM Keynote
Thermodynamic Model for Predicting the Embodied Energy of Titanium Alloys Produced by Powder Metallurgy: *James Paramore*[1]; Brady Butler[1]; Matthew Dunstan[1]; Z. Zak Fang[2]; [1]US Army Research Laboratory; [2]University of Utah

4:30 PM Invited
Improved Exothermic Reactivity of Surface-mediated Fine Aluminum Powders: *Kyung Tae Kim*[1]; Injoon Son[2]; [1]Korea Institute of Materials Science; [2]Kyungpook National University

5:00 PM
Preparation of Mo2C by Reduction and Carbonization of MoO2 with Ethanol: *Zepeng Lv*[1]; Jie Dang[1]; Chenguang Bai[1]; [1]Chongqing University

PSDK XIV: Phase Stability and Diffusion Kinetics — Applications of Thermodynamics and Diffusion

Program Organizers: Michael Gao, National Energy Technology Laboratory; Hans Seifert, Karlsruhe Institute of Technology; Zi-Kui Liu, Pennsylvania State University; Fan Zhang, CompuTherm LLC; Richard Otis, Jet Propulsion Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory

Wednesday PM
October 2, 2019

Room: E144
Location: Oregon Convention Center

Session Chairs: Yunzhi Wang, Ohio State University; Ichiro Takeuchi, University of Maryland

2:00 PM Invited
Segregation, Segregation Transition and Localized Phase Transformation at Stacking Faults: Longsheng Feng[1]; You Rao[1]; Ashton Egan[1]; Maryam Ghazisaeidi[1]; Michael Mills[1]; *Yunzhi Wang*[1]; [1]Ohio State University

2:20 PM
Divergent Pearlite Growth in Fe-Mn-C Steel: Phase-field Simulations: *Leslie Mushongera*[1]; [1]University of Nevada Reno

2:40 PM
Phase Field Study of Nucleation, Growth, and Reversion in a Ternary IN625 Analogue: *Trevor Keller*[1]; Nana Ofori-Opoku[1]; Greta Lindwall[1]; Ursula Kattner[1]; Jonathan Guyer[1]; [1]National Institute of Standards and Technology

3:00 PM Invited
Machine Learning Representations for Grain Boundaries: *Gus Hart*[1]; Andrew Nguyen[2]; Eric Homer[1]; Derek Hensley[1]; Conrad Rosenbrock[1]; [1]Brigham Young University; [2]Nguyen Research

3:20 PM Invited
Defects Diffusion in Concentrated Alloys: Percolation Effects, Sluggish and Chemically Biased Atomic Transport and Phase Stability: *Osetskiy Yury*[1]; Alexander Barashev[2]; James Morris[1]; Yanwen Zhang[1]; [1]Oak Ridge National Laboratory; [2]University of Michigan

3:40 PM Break

4:00 PM Invited
Combinatorial Experimentation and Machine Learning for Materials Discovery: *Ichiro Takeuchi*[1]; [1]University of Maryland

4:20 PM Invited
Model Sensitivity Scores for Calculated Phase Equilibria: *Richard Otis*[1]; [1]Jet Propulsion Laboratory

4:40 PM Invited
Multi-Physics Modeling for Analysis of Material Degradation in Advanced Test Reactors: *Michael Glazoff*[1]; Jeffrey Brower[1]; Thomas Eiden[2]; [1]Idaho National Laboratory [2]Atomic Alchemy, Inc.

5:00 PM
Time-temperature-precipitation Characteristics of Nitride Penetration in Austenitic Stainless Steel: *Alice Young*[1]; Milo Kral[1]; Catherine Bishop[1]; [1]University of Canterbury

Sandphobic Thermal/Environmental Barrier Coatings — Sandphobic Thermal/Environmental Barrier Coatings I

Program Organizers: Michael Walock, U.S. Army Research Laboratory; Andy Nieto, US Army Research Laboratory; Clara Mock, US Army Research Laboratory; Anindya Ghoshal, US Army Research Laboratory; Muthuvel Murugan, US Army Research Laboratory; Marc Pepi, US Army Research Laboratory

Wednesday PM
October 2, 2019

Room: C120
Location: Oregon Convention Center

Session Chairs: Marc Pepi, US Army Research Laboratory; Clara Mock, US Army Research Laboratory

2:00 PM Introductory Comments: Summarize Dongming's Career/ Contributions to T/EBCs and CMAS

2:10 PM
Progress and Challenges in Understanding CMAS Attack and Developing CMAS-phobic T/EBCs: *Andy Nieto*[1]; Clara Hofmeister-Mock[2]; Richa Agrawal[1]; Luis Bravo[2]; Anindya Ghoshal[2]; Michael Walock[2]; Muthuvel Murugan[2]; [1]Naval Postgraduate School; [2]US Army Research Laboratory

2:30 PM Invited
Turbulence Modulation Effects in Particle-laden Shear Driven Flows and its Impact on Material Deposition: Luis Bravo[1]; *Nishan Jain*[2]; Prashant Khare[3]; Anindya Ghoshal[1]; Muthuvel Murugan[1]; Alison Flatau[2]; [1]US Army Research Laboratory; [2]University of Maryland; [3]University of Cincinnati

3:00 PM Invited
Development of Novel CMAS/VA Resistant TBCS: Influence of Chemical Composition and the Microstructure: *Ravisankar Naraparaju*[1]; Juan Gomez Chavez[2]; Christoph Mikulla[1]; Mohammad Rizviul Kabir[1]; Philipp Niemeyer[1]; Peter Mechnich[1]; Uwe Schulz[1]; [1]German Aerospace Center; [2]University of Texas ElPaso

3:30 PM Break

3:50 PM
Carbon Nanotube (CNTs) Reinforced Ceramic Thin Films as Thermal/ Environmental Barrier Coatings (T/EBCs) for Aerospace Applications: *Cheryl Xu*[1]; Bill Nickerson[2]; [1]NC State University; [2]Office of Naval Research

4:10 PM Invited
Multlayer, Multifunctional, Thermo-structural Coatings to Mitigate Molten Silicate Attack in Aeroengines: *Sanjay Sampath*[1]; Edward Gildersleeve[1]; [1]Stony Brook University

4:40 PM Invited
Multiphase Thermal Barrier Coatings for Broad-base Resistance to Silicate Deposits: *David Poerschke*[1]; [1]University of Minnesota

5:10 PM
Effects of Silicate Melt Chemistry on Thermochemical Interactions with Thermal Barrier Oxides: *Najeb Abdul-Jabbar*[1]; Paul Kuhn[2]; Sarah Miller[2]; Carlos Levi[2]; [1]Los Alamos National Laboratory; [2]University of California, Santa Barbara

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

Program Organizers: John Ayers, University of Connecticut; Phil Ahrenkiel, South Dakota School of Mines and Technology; Ganesh Balakrishnan, University of New Mexico

Wednesday PM
October 2, 2019

Room: C121
Location: Oregon Convention Center

Session Chairs: Phil Ahrenkiel, South Dakota School of Mines and Technology; Ganesh Balakrishnan, University of New Mexico; John Ayers, University of Connecticut

2:00 PM Introductory Comments

2:20 PM Invited
Advances in Compositionally Graded Buffers for Ultrahigh Efficiency III-V Multijunction Solar Cells: *Ryan France*[1]; [1]National Renewable Energy Laboratory

3:00 PM
Control of Ordering in III-V Alloys using Plasma-enhanced MOCVD and the Measurement of Order Parameter by Electron Diffraction: *Phil Ahrenkiel*[1]; Nathan Smaglik[1]; Xavier Pasala[1]; Nikhil Pokharel[1]; Kirstin Alberi[2]; Kamran Forghani[3]; [1]South Dakota School of Mines & Technology; [2]National Renewable Energy Laboratory; [3]MicroLink Devices, Inc.

3:20 PM
Nanoscale Tomography of Functional Properties for Superlattice Heterostructures: Thomas Moran[1]; *Jingfeng Song*[1]; James Steffes[1]; Tadasu Hosokura[2]; Yen Lin Huang[3]; Koji Murayama[4]; Nobuhiko Tanaka[4]; Ramamoorthy Ramesh[3]; Keigo Suzuki[4]; Bryan Huey[1]; [1]University of Connecticut; [2]2Murata Manufacturing Co., Ltd.; [3]Materials Science and Engineering, University of California, Berkeley; [4]2Murata Manufacturing Co., Ltd.,

3:40 PM Break

4:00 PM
Investigating Dislocation Networks in the Growth of GaSb on GaAs using Transmission Electron Microscopy.: *Ganesh Balakrishnan*[1]; Darryl Shima[1]; Sadhvikas Addamane[1]; [1]University of New Mexico

4:20 PM
Criterion for Dislocation Compensation in a Semiconductor Heterostructure Utilizing a Buffer Layer: *Tedi Kujofsa*[1]; Md Islam[1]; John Ayers[1]; [1]University of Connecticut

4:40 PM
Nanoscale Semiconducting Metal Oxide Heterostructures for Gas Sensing Applications: *Janine Walker*[1]; Sheikh Akbar[1]; Patricia Morris[1]; [1]Ohio State University

5:00 PM
Effect of Heterojunction Interface on Gas Sensing Properties of Hetero-Nanostructured Oxides: *Priyanka Karnati*[1]; Sheikh Akbar[1]; Patricia Morris[1]; [1]Ohio State University

Sintering and Related Powder Processing Science and Technologies — Advanced Sintering Techniques

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

Wednesday PM
October 2, 2019

Room: E142
Location: Oregon Convention Center

Session Chairs: Eugene Olevsky, San Diego State University; Wolfgang Rheinheimer, Purdue University

2:00 PM Invited
Cold Sintering of Ceramic Materials, Devices and Novel Nanocomposites: *Clive Randall*[1]; [1]Penn State University

2:30 PM Invited
Controlling Factors in Flash Sintering of Ceramics: *Richard Todd*[1]; Wei Ji[2]; Zhengyi Fu[3]; Yinsheng Li[1]; Yasuhiro Kubota[1]; Andrew Gibson[1]; [1]University of Oxford; [2]University of Oxford/Wuhan University of Technology; [3]Wuhan University of Technology

3:10 PM
Staged Microstructural Study of Flash Sintered Titania: *Xin Li Phuah*[1]; Han Wang[1]; Harry Charalambous[2]; Shikhar Jha[2]; Jin Li[1]; Thomas Tsakalakos[2]; Xinghang Zhang[1]; Haiyan Wang[1]; [1]Purdue University; [2]Rutgers University

3:30 PM Break

3:50 PM
Room Temperature Plasticity in Flash-sintered TiO2: *Jin Li*[1]; Jaehun Cho[1]; Jie Ding[1]; Harry Charalambous[2]; Sichuang Xue[1]; Han Wang[1]; Xin Li Phuah[1]; Thomas Tsakalakos[2]; R. Edwin García[1]; Amiya K. Mukherjee[3]; Noam Bernstein[4]; C. Stephen Hellberg[4]; Haiyan Wang[1]; Xinghang Zhang[1]; [1]Purdue University; [2]Rutgers University; [3]University of California, Davis; [4]U.S. Naval Research Laboratory

4:10 PM
Analysis of SPS Parameters and Resultant Electrical Response of SPS Sintered Specimens: Rosario Gerhardt[1]; *Thomas Rudzik*[1]; [1]Georgia Institute of Technology

Surface Protection for Enhanced Materials Performance: Science, Technology, and Application — Ceramic Coatings Formed by Aerosol Deposition II / Coatings and Surface Modifications for Oxidation, Corrosion, and Wear Resistance

Program Organizers: Kang Lee, NASA Glenn Research Center; Jun Song, McGill University; Yutaka Kagawa, University of Tokyo; 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; Stephen Yue, McGill University; Richard Chromik, McGill University

Wednesday PM
October 2, 2019

Room: D137
Location: Oregon Convention Center

Session Chairs: Scooter Johnson, Naval Research Laboratory; Valerie Wiesner, NASA Glenn Research Center; Daniel Mumm, University of California, Irvine

2:00 PM
Effects of Aerosol Deposited Coatings on Substrate Materials: *Eric Patterson*[1]; Heonjune Ryou[2]; Scooter Johnson[1]; Edward Gorzkowski[1]; [1]U.S. Naval Research Laboratory; [2]ASEE Post-Doctoral Fellow

2:20 PM
Nanostructured Cu-Al_2O_3 Thick Films Produced through Aerosol Deposition of Composite Powder: *Kevin Anderson*[1]; Eric Patterson[1]; Scooter Johnson[1]; Edward Gorzkowski[1]; Helen Chan[2]; [1]U.S. Naval Research Laboratory; [2]Lehigh University

2:40 PM Invited
Predicting Coating Lifetime of Diffusion and Overlay Coatings: From Manufacturing to Service: *Rishi Pillai*[1]; Beth Armstrong[1]; Sebastien Dyepondt[1]; Bruce Pint[1]; [1]Oak Ridge National Laboratory

3:10 PM
Aluminizing Co-base Superalloys: *Kailey Hanan*[1]; Prafull Pandey[2]; Kamanio Chattopadhyay[2]; Vilupanur Ravi[1]; [1]Cal Poly Pomona; [2]Indian Institute of Science

3:30 PM Break

3:50 PM
Electrodeposited Nanostructured Aluminum Coatings for Cadmium Replacement: Joshua Abbott[1]; *Robert Hilty*[1]; Weilong Zhange[2]; Weina Li[2]; [1]Xtalic Corporation; [2]United Technologies Research Center

4:10 PM
Sublimation Protection Coatings for Thermoelectric Materials for Space Power Applications: *Kang Lee*[1]; Bernadette Puleo[1]; John Setlock[2]; [1]NASA Glenn Research Center; [2]University of Toledo

4:30 PM
Exploiting Suspension Plasma Spraying for Oxide and Carbide Based Wear Resistant Coatings: Wael Algenaid[1]; Satyapal Mahade[1]; Govindarajan Sivakumar[2]; Karthik Narayanan[1]; Nicholas Curry[3]; *Shrikant Joshi*[1]; [1]University West; [2]ARCI; [3]Treibacher Industrie AG

4:50 PM
Corrosion Inhibition of Stainless Steel (AISI 316) by Environmental Friendly Inhibitor in Chloride Medium: Electrochemical and Physical Study: *Omotayo Sanni*[1]; Popoola Patricia[1]; [1]Tshwane University of Technology, Pretoria, South Africa

5:10 PM
Obtaining Surface Coatings Providing Protection Against Extreme Conditions of Coke Production: *Borys Sereda*[1]; Dmytro Sereda[1]; Alexander Gaydaenko[1]; Irina Kruglyak[1]; [1]Dneprovsky State Technical University

Synthesis, Characterization, Modeling 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 (NIST); Kevin Huang, University of South Carolina

Wednesday PM
October 2, 2019
Room: D139
Location: Oregon Convention Center

Session Chairs: Kevin Huang, University of South Carolina; Matthew Lawson, Boise State University

2:00 PM Invited
Defect-driven Metal Oxide Electrodes for Lithium Ion Batteries: *Hui Xiong*[1]; Pete Barnes[1]; Kiev Dixon[1]; Yunxing Zuo[2]; Shyue Ping Ong[2]; [1]Boise State University; [2]University of California - San Diego

2:20 PM
Phase Field Simulation of Ni Coarsening in the Porous Anode of Solid Oxide Fuel Cell: *Yinkai Lei*[1]; Tian-Lei Cheng[1]; Harry Abernathy[1]; Gregory Hackett[1]; Youhai Wen[1]; [1]US Department of Energy National Energy Technology Laboratory

2:40 PM
An Attempt to Interpret Pressure and Temperature Dependent Elasticity of Porous Ceramics using Resonant Ultrasound Spectroscopy: *Ashoka Karunarathne*[1]; Joseph Gladden[1]; Gautam Priyadarshan[1]; [1]University of Mississippi

3:00 PM
Organic Functionalized One-step Filtration-catalysis Photoresponsive Titania Membranes: *Evan Hyde*[1]; Matthew Beck[1]; [1]University of Kentucky

3:20 PM Break

3:40 PM
3D Morphology and Mechanical Behavior of Porous Cu Fabricated by Chemical De-Alloying Method: *Fei Chen*[1]; Lijie Zou[1]; Hao Wang[1]; Yu-chen Karen Chen-Wiegart[2]; Qiang Shen[1]; Lianmeng Zhang[1]; [1]Wuhan University of Technology; [2]Stony Brook University/Brookhaven National Laboratory

4:00 PM
Structure-mechanical Properties in Solid Solution Strengthened Nanoporous Copper Alloys.: *Alexandra Yailuth Loaiza Lopera*[1]; Jung-Ting Tsai[1]; David Bahr[1]; [1]Purdue University

4:20 PM
Studying the Scaling Laws and Mechanical Properties of Nano Porous (NP) Metals: *Ankit Gupta*[1]; Antonia Antoniou[2]; Garritt Tucker[1]; [1]Colorado School of Mines; [2]Georgia Institute of Technology

4:40 PM
The Formation of Intermetallic Catalysts Porous Structures: *Borys Sereda*[1]; Yuriy Belokon[1]; Karina Belokon[1]; Irina Krugljak[1]; Dmytro Sereda[1]; Aleksandr Korobochka[1]; [1]Dneprovsky State Technical University

5:00 PM
Tensile Behavior of Stitched Log-pile Structures Developed via Direct Laser Writing: *Alina Garcia Taormina*[1]; Andrea M. Hodge[1]; [1]University of Southern California

Thermal Protection Materials and Systems — TPS Materials Development and Testing II

Program Organizers: Jeff DeMange, Integration Innovation, Inc. (i3); Frances Hurwitz, NASA Glenn Research Center; Arturs Jasjukevics, ArianeGroup; Thomas Reimer, German Aerospace Center

Wednesday PM
October 2, 2019
Room: B114
Location: Oregon Convention Center

Session Chairs: Jeff DeMange, Integration Innovation, Inc. (i3); Thomas Reimer, German Aerospace Center

2:00 PM
Testing of Cork-based Spray-on Thermal Protection Materials in an Arc-Jet Environment: *Thomas Reimer*[1]; [1]DLR

2:30 PM
Thermal Stability Improvement of Fungal Mycelium: *Xijin Zhang*[1]; Chanjuan Han[1]; Gary Wnek[1]; Xiong (Bill) Yu[1]; [1]Case Western Reserve University

2:50 PM
Investigation of Strength Characteristics of Styrofoam and Gum Arabic in Biodegradable Materials for Lagging Purposes: Sulaiman Abdulkareem[1]; Mustapha Ndagi[1]; *Abdulrahim Abdulbaqi*[2]; Tajudeen Ajiboye[1]; [1]Uinversity of Ilorin; [2]University of Maiduguri, P.M.B 1069, Bama Road, Maiduguri, Nigeria

3:20 PM Concluding Comments

Thermomechanical Processing in Shaping and Forming of Steels — Thermomechanical Processing in Shaping and Forming of Steels I

Program Organizers: Evgueni Poliak, Arcelormittal; Amy Clarke, Colorado School of Mines; Kester Clarke, Colorado School of Mines; Pello Uranga, CEIT and TECNUN (University of Navarra)

Wednesday PM
October 2, 2019
Room: C123
Location: Oregon Convention Center

Session Chairs: Evgueni Poliak, ArcelorMittal East Chicago; Pello Uranga, CEIT; Kester Clarke, Colorado School of Mines; Amy Clarke, Colorado School of Mines

2:00 PM
Yield Strength Improvement in 3rd Generation AHSS Through Warm Rolling: *Alla Sergueeva*[1]; Andrew Frerichs[1]; Brian Meacham[1]; Sheng Cheng[1]; Daniel Branagan[1]; [1]NanoSteel Company Inc

2:20 PM
Effect of Thermomechanical Strategy and Mo-Nb-B Alloying Additions on High Strength Medium Carbon Q/Q&T Steels: Irati Zurutuza[1]; Nerea Isasti[1]; Eric Detemple[2]; Volker Schwinn[2]; Hardy Mohrbacher[3]; *Pello Uranga*[1]; [1]CEIT and TECNUN (University of Navarra); [2]AG der Dillinger Hüttenwerke; [3]NiobelCon bvba

2:40 PM
Effects of Thermomechanical Processing, Microalloying, and Rapid Heat Treatment on Microstructural Development, Carbonitride Precipitation, and Mechanical Behavior of Medium Carbon Steels: *Blake Whitley*[1]; John Speer[2]; Robert Cryderman[2]; Kip Findley[2]; [1]Exponent; [2]Colorado School of Mines

3:00 PM
Deformation Behavior of Non-metallic Inclusions during the Hot Torsion Process of Carbon Steel: Kaiyu Peng[1]; Wen Yang[1]; *Lifeng Zhang*[1]; [1]University of Science and Technology Beijing

3:20 PM Break

3:40 PM
Microstructural Evolution of Two Automotive Steels Induced by Warm Forging and Subcritical Annealing: *Wilson Alexander Hormaza Rodríguez*[1]; Carlos Augusto Oliveira[2]; Gabriel Castro Güiza[3]; Luis Miguel Méndez Moreno[4]; [1]Universidad de Ingeniería y Tecnología - UTEC; [2]Universidade Federal de Santa Catarina; [3]Universidad Central; [4]Universidad Nacional de Colombia

4:00 PM
Ferrite and Bainite Transformation from Austenite Grain Boundary in 0.6 wt.% C Steel: *Shotaro Jimbo*[1]; Shoichi Nambu[1]; [1]University of Tokyo

4:20 PM
Formation of Polygonized Structures and Nuclear Recrystallization under Controlled Rolling of Low-carbon Steels: *Sergey Shejko*[1]; Valerii Mishchenko[1]; George Sukhomlin[2]; [1]Zaporizhzhia National University; [2]Pridneprovsk State Academy of Civil Engineering and Architecture

11th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Design and Development of Sustainable Technologies

Program Organizers: Surojit Gupta, University of North Dakota; Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technololgy; John Wolodko, University of Alberta; Christopher Taylor, DNV GL; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin; 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

Thursday AM
October 3, 2019

Room: Portland Ballroom 255
Location: Oregon Convention Center

Session Chairs: Allen Apblett, Oklahama State University; Basak Anameric, University of Minnesotta; Sabah Javaid, University of North Dakota; Maharshi Day, University of North Dakota

8:00 AM
Reduction and Immobilization of Chromate Using Nanometric Pyrite: *Allen Apblett*[1]; Zach Brown[1]; Amelia Bergeson[2]; [1]Oklahoma State University; [2]Tulane University

8:20 AM
Selective Carbothermic Reduction and Smelting (SCRS) Process for Beneficiation of Low-grade Iron-manganese Mineral Deposits: *Basak Anameric*[1]; [1]NRRI Coleraine Labs

8:40 AM
Molecular Imprinted Polymer (MIP) for the Selective Separation of Vanadium from Acidic Aqueous Solution: *Mengnan Wang*[1]; Jose Gonzalez-Rodriguez[1]; Terence Makanyire[2]; [1]University of Lincoln; [2]GSA Environmental Ltd

9:00 AM
Relations between Microstructure and Mechanical Properties of Post-sintered RBSN with Sintering Additives of Re_2O_3-MgO/SiO_2: *Jae-Woong Ko*[1]; Mi-Ju Kim[1]; Ha-Neul Kim[1]; Young-Jo Park[1]; [1]Korea Institute of Materials Science

9:20 AM
The Behavior of Supersonic Oxygen Gas Injection in Steelmaking Converter: Jeong Han[1]; *Jae-Hong Kwon*[1]; Ji-A Lee[1]; Chang-soo Ha[2]; [1]Inha University; [2]POSCO

9:40 AM
Manufacture of the Invar Fine Metal Mask for the OLED Display Using an Electroforming Technique: *Yong Bum Park*[1]; In Gyeong Kim[1]; [1]Sunchon National University

10:00 AM Break

10:20 AM
On the Design of Novel PLA/PHA and Lignin-based Composites: *Saud Abu Aldam*[1]; Kathryn Hall[1]; Maharshi Dey[1]; Surojit Gupta[1]; [1]University of North Dakota

10:40 AM
A Kinetic Model for Interaction of Iron Powder with Alumina Refractory Relevant to the Novel Flash Ironmaking Technology (FIT): *Rahul Sarkar*[1]; Hong Yong Sohn[1]; [1]University of Utah

11:00 AM
Boron Removal from Si-Cu-Sn Alloy in Metallurgical Refining Process of Silicon: *Tomohiro Mizutani*[1]; [1]The University of Tokyo

11:20 AM
Effect of Ambient Parameters on Electric Field Induced Localized Chemical Etching of Cr Film for Micro-nano Patterning: *Sumit Kumar*[1]; Praveen Kumar[1]; Rudra Pratap[1]; [1]IISc Banaglore

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing of Composite Materials and Composite Like Structures

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

Thursday AM
October 3, 2019

Room: B115
Location: Oregon Convention Center

Session Chair: Prashanth Konda Gokuldoss, Tallinn University of Technology

8:00 AM
Alloy Synthesis for Additive Manufacturing using Directed Energy Deposition: *Amrita Basak*[1]; [1]Pennsylvania State University

8:30 AM
Additive Manufactured SS316 and C300 Maraging Steel Functionally Composition Graded Joint: *Peter Hosemann*[1]; Ashley Richardt[2]; Adi Benartzy[1]; [1]University of California, Berkeley; [2]Space X

8:50 AM
Additive Manufacturing of C103 for Aerospace Applications: *Brady Dowdell*[1]; Tim Horn[1]; [1]North Carolina State University

9:10 AM
Additive Manufacturing of Reinforced 316L Stainless Steel: *Maija Nyström*[1]; Hannu Heikkinen[1]; Antti Mutanen[1]; Antti Pörhönen[1]; [1]Electro Optical Systems Finland Oy

9:30 AM
High-temperature Mechanical Properties and Microstructure of Additively Manufactured 304L Stainless Steel ODS Alloy: *Milad Ghayoor*[1]; Kijoon Lee[1]; Yujuan He[2]; Chih-Hung Chang[2]; Brian K. Paul[1]; Somayeh Pasebani[1]; [1]School of Mechanical, Industrial and Manufacturing Engineering, Oregon State University; [2]School of Chemical, Biological and Environmental Engineering, Oregon State University

9:50 AM
Hybrid Tooling Using Laser Powder Bed Fusion: Microstructural Analysis of the Interface: *Sandra Megahed*[1]; Maximilian Voshage[1]; Raphael Koch[2]; Thomas Brenker[2]; Johannes Schleifenbaum[3]; [1]RWTH Aachen University; [2]Ford John Andrews Research Centre; [3]RWTH Aachen Unviersity; Fraunhofer-Institute for Laser Technolgoy ILT

10:10 AM Break

10:30 AM
Improving the High-temperature Mechanical Properties of Additively Manufactured 316L Stainless Steel through Nanoparticles Reinforcement: *Bandar AlMangour*; Young-Kyun Kim[1]; Dariusz Grzesiak[2]; Kee-Ahn Lee[1]; [1]Department of Materials Science and Engineering, Inha University; [2]Department of Mechanical Engineering and Mechatronics, West Pomeranian University of Technology

10:50 AM
Influence of AM Microstructural Features on 316L Mechanical Properties and Corrosion Behavior: *Richard Fonda*[1]; Jerry Feng[1]; Krystaufeux Williams[2]; [1]Naval Research Laboratory, Materials Science & Technology Division; [2]Naval Research Laboratory, Chemistry Division

11:10 AM
Additive Manufacturing of AF9628 Steel: E.M. Hager[1]; P.J. Flater[1]; *Vikas Sinha*[2]; E.J. Payton[1]; R.A. Kemnitz[3]; R.P. O'Hara[3]; [1]Air Force Research Laboratory; [2]Air Force Research Laboratory/UES, Inc. ; [3]Air Force Institute of Technology

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing: Materials, Solidification, Controlled Growth, Properties and Testing

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

Thursday AM
October 3, 2019

Room: B114
Location: Oregon Convention Center

Session Chair: Sudarsanam Suresh Babu, The University of Tennessee, Knoxville

8:00 AM
Analysis of Three-dimensional Interface Texture in Additively Manufactured 316L: *David Rowenhorst*[1]; Aeriel Murphy-Leonard[1]; Richard Fonda[1]; [1]US Naval Research Laboratory

8:20 AM
Using Ultrasonic Compaction Technique in Laser Powder Bed Fusion Additive Manufacturing: *Hyeyun Song*[1]; Paul Boulware[1]; Heimdall Mendoza[1]; Rodrigo Enriquez[1]; Amin Moghaddas[1]; [1]EWI

8:40 AM
On-demand Magnetohydrodynamic Droplet Jetting of 6061 Aluminum: *Denis Cormier*[1]; Usama Rifat[1]; Khushbu Zope[1]; Paarth Mehta[1]; [1]Rochester Institute of Technology

9:00 AM
Single Crystalline Stainless Steel 316L Thin Struts Processed by Laser Powder Bed Fusion: *Xianglong Wang*[1]; Jose Alberto Muñiz-Lerma[1]; Oscar Sanchez-Mata[1]; Mohammad Attarian Shandiz[1]; Nicolas Brodusch[1]; Raynald Gauvin[1]; Mathieu Brochu[1]; [1]McGill University

9:20 AM
Additive Manufacturing ICME Platform: From Powder Feed Stock to Heat Treated Final Product: *Mustafa Megahed*[1]; Joerg Willem[1]; Hans-Wilfried Mindt[1]; Jiadong Gong[2]; Abhinav Saboo[2]; Greg Olson[2]; [1]Esi Group; [2]Questek

9:40 AM
Impacts of Microstructure on Mechanical Behavior of Additively Manufactured Metals: *Allison Beese*[1]; [1]Pennsylvania State University

10:00 AM
Solid-State Additive Manufacturing of Aluminum based Alloys and Aluminum Matrix Composites Using Additive Friction Stir Deposition: Joey Griffiths[1]; Hunter Rauch[1]; Yunhui Zhu[1]; *Hang Yu*[1]; [1]Virginia Polytechnic Institute

Additive Manufacturing of Metals: Post Processing — Various Post Treatments

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

Thursday AM
October 3, 2019

Room: B110
Location: Oregon Convention Center

Session Chair: Ola Harrysson, North Carolina State University

8:00 AM
In-situ Synthesis of a High Strength Oxide Dispersion Strengthened Alloy by Selective Laser Melting: *Chunlei Qiu*[1]; [1]Beihang University

8:20 AM
Laser Beam Powder Bed Fusion and Post Processing of Alloy 247LC: *Olutayo Adegoke*[1]; Joel Andersson[1]; Olarenwaju Ojo[2]; Håkan Brodin[3]; Robert Pederson[1]; [1]University West; [2]University of Manitoba; [3]Siemens Industrial Turbomachinery AB

8:40 AM
Laser–MIG Hybrid Welding of AlSi10Mg Parts Produced by Selective Laser Melting: *Li Cui*[1]; Yaoqing Chang[1]; Hongxi Chen[1]; Dingyong He[1]; [1]Beijing University of Technology

9:00 AM
Microstructural Evolution in Laser Powder Bed Fusion AlSi10Mg: *Bryan Mcenerney*[1]; Robert Dillon[1]; John Paul Borgonia[1]; Molly Hwang[1]; [1]NASA Jet Propulsion Laboratory

9:20 AM
Post Processing AM-made Rotorplates for Axial Flux Permanent Magnet Motors: Successes and Challenges: *Samuel Hocker*[1]; Christopher Stelter[1]; [1]NASA

Additive Manufacturing: Microstructure and Material Properties of Titanium-based Alloys — Laser Powder Bed Fusion - Session II

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

Thursday AM
October 3, 2019

Room: B116
Location: Oregon Convention Center

Session Chair: Andrzej Wojcieszynski, ATI Powder Metals

8:00 AM
Experimental and Numerical Studies on Micro-cracking of PBF-processed TiAl Single Tracks: *Yoon Suk Choi*[1]; Seulbi Lee[1]; Jaewoong Kim[1]; Jae-Keun Hong[2]; Dae-Geun Nam[3]; [1]Pusan National University; [2]Korea Institute of Materials Science; [3]Korea Institute of Industrial Technology

8:20 AM
Fatigue Life Prediction of Additively Manufactured Ti-6Al-4V under Machined and as-Built Surface Conditions: *Sushant Jha*[1]; John Ruschau[1]; Sarah Kuhlman[1]; Mark Benedict[2]; Thad Kacsandy[1]; Jessica Orr[1]; [1]University of Dayton Research Institute; [2]US Air Force Research Laboratory

8:40 AM
Investigating the Overlap Regions of the EOS M400-4: *Robin Pacheco*[1]; Michael Brand[1]; Colt Montgomery[1]; John Carpenter[1]; Robert Forsyth[1]; Jessica Lopez[1]; Carl Cady[1]; [1]Los Alamos National Laboratory

9:00 AM
Oligocrystalline Structure Formation in an Additive Manufactured Beta Titanium Alloy: Rodolfo Batalha[1]; Simon Pauly[2]; Cláudio Kiminami[3]; *Piter Gargarella*[3]; [1]Posgraduate Program in Materials Science and Engineering/ Federal University of São Carlos; [2]IFW-Dresden and University of Applied Sciences Aschaffenburg; [3]Materials Engineering Department/Federal University of São Carlos

9:20 AM
The Microstructure and Mechanical Properties of TiNbTaZr ??-Titanium Alloy Fabricated by Laser Powder Bed Fusion: *Weihuan Kong*[1]; Parastoo Jamshidi[1]; Sophie Cox[1]; Moataz Attallah[1]; [1]University of Birmingham

9:40 AM
Wear-corrosion Synergism Behavior of Additive Manufactured Ti-6Al-4V Alloy: *Pankaj Kumar*[1]; Arpith Siddaiah[1]; Ashish Kasar[1]; Javed Akram[2]; Pradeep Menezes[1]; Mano Misra[1]; [1]University of Nevada, Reno; [2]Ansys

Advanced Manufacturing, Processing, Characterization and Modeling of Functional Materials — Magnetic and Other SMAs

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

Thursday AM
October 3, 2019

Room: D136
Location: Oregon Convention Center

Session Chairs: Moataz Attallah, University of Birmingham; Keyvan Safaei Baghbaderani, University of Toledo

8:00 AM
Optimization of Process Parameters for Additive Manufacturing of High Temperature Shape Memory Alloys: *Mohammadreza Nematollahi*[1]; Guher P. Toker[2]; S. Ehsan Saghaian[2]; Keyvan Safaei Baghbaderani[1]; Othmane Benafan[3]; Haluk E. Karaca[2]; Mohammad Elahinia[1]; [1]University of Toledo; [2]University of Kentucky; [3]NASA Glenn Research Center

8:30 AM
Effects of Hot-isostatic Pressing on the Microstructural and Magnetic Properties Development in Permalloy-80 Manufactured by Laser Powder Bed Fusion: *Ji Zou*[1]; Abdel-Moez Mohamed[1]; Chiu Tang[2]; Sheng Li[1]; Kai Bongs[1]; Moataz Attallah[1]; [1]University of Birmingham; [2]Diamond Light Source

8:50 AM
Epitaxial Growth of a Magnetic Shape-memory Alloy: Laser Metal Deposition of Ni-Mn-Ga: *Jakub Toman*[1]; Peter Müllner[2]; Markus Chmielus[1]; [1]University of Pittsburgh; [2]Boise State University

9:10 AM
Magnetic Shielding Promotion in Laser Powder Bed Fusion of NiFeMo Permalloy via Directional Grain Formation and Thermal Post Processing: *Abdel-Moez Mohamed*[1]; Richard Sheridan[1]; Ji Zou[1]; Kai Bongs[1]; Moataz Attallah[1]; [1]University of Birmingham

9:30 AM
Laser- and Binder-based Additive Manufacturing and Post-processing of Functional Magnetic Materials: *Markus Chmielus*[1]; Jakub Toman[1]; Runbo Jiang[1]; Pierangeli Rodriguez De Vecchis[1]; Amir Mostafaei[2]; Rafael Rodriguez De Vecchis[1]; Aaron Acierno[1]; Katerina Kimes[1]; Erica Stevens[1]; [1]University of Pittsburgh; [2]Carnegie Mellon University

9:50 AM Break

10:10 AM
On the Effect of the Build Direction in Mechanical Fatigue Life of the SLM Fabricated NiTi: *Parisa Bayati*[1]; Ahmadreza Jahadakbar[1]; Mohammadreza Nematollahi[1]; Mohammad J. Mahtabi[1]; Mohammad Elahinia[1]; [1]The University of Toledo

10:30 AM
Investigation of the Deposition Mechanism of Nano-CeO_2 Catalyst within SOFC Electrodes using Bio-adhesive Catechol Surfactants: Ozcan Ozmen[1]; Shiwoo Lee[2]; Gregory Hackett[2]; Harry Abernathy[2]; *Edward Sabolsky*[1]; [1]West Virginia University; [2]US DOE-National Energy Technology Laboratory

10:50 AM
Optimizing Additive Manufacturing of NiTi by Controlling Linear and Volumetric Energy Densities: *Sayed Ehsan Saghaian*[1]; M. Nematollahi[2]; G.P. Toker[1]; A. Hinojos[3]; M.J. Mills[3]; M. Elahinia; M. Elahinia[2]; H. Karaca[1]; [1]University of Kentucky; [2]University of Toledo; [3]Ohio State University

11:10 AM
Protonic Ceramic Electrolyzer Cells Manufactured by a Novel Laser 3D Printing Technique: *Jianhua "Joshua" Tong*[1]; [1]Clemson University

11:30 AM
Integrated Heat Transfer and Material Model to Predict Magnetic Field-induced Strain in an Additively Manufactured Magnetic Shape Memory Alloy: *Yao Xu*[1]; Sneha Narra[1]; [1]Worcester Polytechnic Institute

Advances in Understanding of Martensite in Steels — Transformations & Crystallography

Program Organizers: Ian Zuazo, ArcelorMittal Global R&D - (CRMC, Industeel); Amy Clarke, Colorado School of Mines; Eric Payton, Air Force Research Laboratory; Janelle Wharry, Purdue University; Kester Clarke, Colorado School of Mines; Eric Lass, University of Tennessee, Knoxville; Mohsen Asle Zaeem, Colorado School of Mines

Thursday AM
October 3, 2019
Room: C125
Location: Oregon Convention Center

Session Chairs: Ian Zuazo, ArcelorMittal Global R&D; Janelle Wharry, Purdue University

8:30 AM Invited
Variant Structure of Martensite and Bainite in Steels: *Goro Miyamoto*[1]; Tadashi Furuhara[1]; [1]Tohoku University

9:00 AM Invited
Phase Transformation Behaviors in Sandwich-like Clad Sheet Composed of Low and High Carbon Steels: *Rintaro Ueji*[1]; Tadanobu Inoue[1]; [1]National Institute for Materials Science

9:30 AM
Substructure of Lenticular Martensite Formed from Austenite Containing Hydrogen in Fe-31Ni Alloy: *Akinobu Shibata*[1]; Masanori Enoki[2]; Nahoko Saji[1]; Hirotaka Tai[1]; Motomichi Koyama[2]; Hiroshi Ohtani[2]; Kaneaki Tsuzaki[3]; Nobuhiro Tsuji[1]; [1]Kyoto University; [2]Tohoku University; [3]Kyushu University

9:50 AM
Probabilistic Reconstruction of Prior Austenite Microstructure in Steels after Microstructure Refinement: *Eric Payton*[1]; Alexander Brust[2]; Stephen Niezgoda[2]; Vikas Sinha[1]; [1]Air Force Research Laboratory; [2]The Ohio State University

10:10 AM Break

10:30 AM Invited
Microstructural Evolution of Conventionally and Rapidly Tempered Martensite in Medium-carbon Steels: *Amy Clarke*[1]; Virginia Judge[1]; Jonah Klemm-Toole[1]; Kester Clarke[1]; Robert Field[1]; Dan Coughlin[2]; Bjorn Clausen[2]; Dean Pierce[3]; Paul Gibbs[2]; Jonathan Poplawsky[3]; Don Williamson[1]; Don Brown[2]; Jonathan Almer[4]; David Alexander[2]; Kip Findley[1]; David Matlock[1]; George Krauss[1]; John Speer[1]; [1]Colorado School of Mines; [2]Los Alamos National Laboratory; [3]Oak Ridge National Laboratory; [4]Argonne National Laboratory

11:00 AM
Influence of Quenching Rate on Microstructure in High Carbon Steels: *Thomas Kohne*[1]; Peter Hedström[1]; Annika Borgenstam[1]; [1]KTH Royal Institute of Technology

11:20 AM
Martensite Morphology in an Additively Manufactured Hot-work Tool Steel: *Niklas Pettersson*[1]; Greta Lindwall[1]; [1]KTH Royal Institute of Technology

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

Program Organizers: Steven Thompson, Colorado School of Mines; C. Isaac Garcia, University of Pittsburgh

Thursday AM
October 3, 2019
Room: C124
Location: Oregon Convention Center

Session Chair: Steven Thompson, Colorado School of Mines

8:00 AM
Neutron Scattering Characterization of Steel Alloys: *Jeffrey Bunn*[1]; [1]Oak Ridge National Laboratory

8:20 AM
Elevated Temperature Mechanical Property-Microstructure Relationships of X70 Pipeline Steels: *Taylor Jacobs*[1]; David Matlock[2]; Kip Findley[2]; [1]Los Alamos National Laboratory; [2]Colorado School of Mines

8:40 AM
Synchrotron Radiation X-ray Diffraction Studies of Carbide Evolution in Fe-Mn-Al-C Steel: *Nathan Ley*[1]; Marcus Young[1]; B. Chad Hornbuckle[2]; Daniel Field[2]; Krista Limmer[2]; [1]University of North Texas; [2]CCDC Army Research Laboratory

9:00 AM
The Reduction Performance of the Ca2 (Fe2-xAlx) O5 Solid Solution: *Fei Liao*[1]; [1]University of Science and Technology Beijing

9:20 AM
Microstructural and Physicochemical Properties of Iron-cerium Alloy: Baoyu Liu[1]; Lingxiao Cui[1]; Yaqiong Li[1]; *Lifeng Zhang*[1]; [1]University of Science and Technology Beijing

9:40 AM
An Improved Method for Characterization of Inclusions in Steels with X-ray Diffraction: *Yang Liu*[1]; Pei Wang[1]; Dianzhong Li[1]; [1]Institute of Metal Research, Chinese Academy of Sciences

Bulk Metallic Glasses and their Composites – Progresses, Outcomes and Prospects — Helium Irradiation Effects in Materials

Program Organizers: Muhammad Rafique; Weidong Li, Corning; Junwei Qiao, Taiyuan University of Technology

Thursday AM
October 3, 2019
Room: E146
Location: Oregon Convention Center

Session Chairs: Yongqiang Wang, Los Alamos National Laboratory; Feng Ren, Wuhan University

8:00 AM Invited
Suppressing Helium Cavity Growth in Ni-based Concentrated Solid Solution Alloys: *Zhe Fan*[1]; X. Wang[1]; S. Zhao[1]; K. Jin[1]; D. Chen[2]; Yury Osetskiy[1]; Y. Wang[2]; H. Bei[1]; W.J. Weber[3]; K.L. More[1]; Y. Zhang[1]; [1]Oak Ridge National Laboratory; [2]Los Alamos National Laboratory; [3]University of Tennessee; Oak Ridge National Laboratory

8:30 AM
Effect of Helium Morphology on Materials Strength in Pure Metals: Application of Richtmyer-Meshkov Instability to Bulk Measurement of Irradiated Properties: *Calvin Lear*[1]; Saryu Fensin[1]; [1]Los Alamos National Laboratory

8:50 AM
Hydrogen and Tritium Effects on Type 309L Stainless Steel: *Paul Korinko*[1]; Michael Morgan[1]; Scott West[1]; [1]Savannah River National Laboratory

9:10 AM Invited
Enhanced Radiation Tolerance of Nanochannel W Films: *Feng Ren*[1]; Wenjing Qin[1]; R. P. Doerner[2]; Huiqiu Deng[3]; Yongqiang Wang[4]; [1]Wuhan University; [2]University of California, San Diego; [3]Hunan University; [4]Los Alamos National Laboratory

9:40 AM
In situ TEM Observation of Helium Bubble Formation under Dual Ion Beam Irradiation: *Meimei Li*[1]; Wei-Ying Chen[1]; Shilei Li[1]; [1]Argonne National Laboratory

10:00 AM Break

10:20 AM Invited
Confinement of He Precipitates Growth within Metal Nano-layers and Implications to Radiation Damage: *Yongqiang Wang*[1]; Di Chen[2]; Nan Li[1]; Dina Yuryev[3]; Kevin Baldwin[1]; Michael Demkowicz[4]; [1]Los Alamos National Laboratory; [2]University of Houston; [3]Massachusetts Institute of Technology; [4]Texas A&M University

10:50 AM
In-situ Observations of Bubble Evolution in Pd during He Implantation at Cryogenic Temperatures in a H2 Environment: *Samuel Briggs*[1]; Anthony Monterrosa[2]; Caitlin Taylor[2]; Graeme Greaves[3]; Jonathan Hinks[3]; Khalid Hattar[2]; [1]Oregon State University; Sandia National Laboratories; [2]Sandia National Laboratories; [3]University of Huddersfield

11:10 AM Invited
Helium Bubble Evolution in Implanted Erbium Deuteride Bulk and Multilayered Structures: *Caitlin Taylor*[1]; Brittany Muntifering[1]; Ron Goeke[1]; Yongqiang Wang[2]; Anthony Monterrosa[1]; Bethany Matthews[3]; Khalid Hattar[1]; Bruce Arey[3]; Dale Zschiesche[1]; [1]Sandia National Laboratories; [2]Los Alamos National Laboratory; [3]Pacific Northwest National Laboratory

11:40 AM
Nanobubbles and Nanocavities in Palladium as a Function of He: *Trevor Clark*[1]; Caitlin Taylor[1]; David Robinson[1]; Joshua Sugar[1]; Khalid Hattar[1]; [1]Sandia National Laboratories

Characterization of Materials and Properties through Metallography, Mechanical Testing and Analysis - From Fundamentals to the Cutting Edge — Microstructural Characterization and the Correlation of Microstructure to Mechanical Properties III

Program Organizer: Michael Keeble, Buehler

Thursday AM
October 3, 2019

Room: F152
Location: Oregon Convention Center

Session Chairs: Mike Keeble, Buehler, a Division of ITW; Don Susan, Sandia National Laboratories; James Martinez, NASA Lyndon B. Johnson Space Center

8:00 AM
Strength and Fatigue Life Characteristics of Cold Rolled AA1200 Aluminium Alloy: *Olusegun Oyekeye*[1]; Samson Adeosun[1]; Joseph Ajiboye[1]; Ademola Agbeleye[1]; [1]University of Lagos

8:20 AM
Measurement of the Unaffected Pores in Dynamic Impact Loading on the Fractured Surface of Selective Laser Melting Built Aluminum Specimens: *Md Salah Uddin*[1]; Brahmananda Pramanik[1]; [1]Montana Technological University

8:40 AM
In-situ Corrosion Fatigue in Ar and s-CO2 Environments: *Andrew Brittan*[1]; Lucas Teeter[1]; Camila Toledo Torres[1]; Samuel Briggs[1]; Guillaume Mignot[1]; Sebastien Teysseyre[1]; Julie Tucker[1]; [1]Oregon State University

9:00 AM
Microstructural Evaluation of Welded Nickel-based Superalloy Inconel 740H with Nimonic 263 after Creep Testing: *Kinga Unocic*[1]; Xiang Chen[1]; Peter Tortorelli[1]; [1]Oak Ridge National Laboratory

9:20 AM
Characterization of Microstructural Evolution in the IN718/Alvac 718Plus EB Welded Joint during Post-weld Heat Treatment Using Electron Microscopy and Tomography Techniques: *Adam Kruk*[1]; Oskar Dziuba[1]; Grzegorz Cempura[1]; Agnieszka Wusatowska-Sarnek[2]; [1]AGH University of Science and Technology; [2]Pratt & Whitney

9:40 AM
Arc Weldability of Incoloy 825 to AISI 321 Stainless Steel Welds: *Navid Sayyar*

10:00 AM Break

10:20 AM
Microstructure and Mechanical Properties of Ni-Al Bronze with Addition of Zr: *Yoonsung Shim*[1]; Dongwook Kim[1]; Cheol Hyun Bae[1]; Jee Hyuk Ahn[2]; Seung Zeon Han[2]; Sung-Mo Lee[1]; [1]Korea Shipbuilding & Offshore Engineering Co., Ltd; [2]Korea Institute of Materials Science

10:40 AM
Effect of Austenite Reverted Transformation Annealing Time on Microstructure, Mechanical, and Electrochemical Properties of Medium Manganese Steel: Muhammad Hafeez[1]; *Ameeq Farooq*[1]; [1]The University of the Punjab

11:00 AM
Effect of Plastic Deformation on the Microstructure and Electrochemical Behavior of 316L: *Ameeq Farooq*[1]; Abdul Basit[1]; [1]University of the Punjab

Crosscutting Issues in Corrosion of Materials: Control, Monitoring, Mitigation and Material Selection — Crosscutting Issues in Lightweight Alloy Corrosion

Program Organizers: Matthew Asmussen, Pacific Northwestern National Laboratory; Jeff Binns, Nuclear Waste Management Organization; James Neeway, Pacific Northwest National Laboratory; John Zhang, Gamry Instruments; Mary Lyn Lim, PPG; Sudhakar Mahajanam, Pinnacle ART; Eric Schindelholz, Sandia National Laboratories; Ajit Mishra, Haynes International; James Noel, Western University; Guang-Ling Song, Xiamen University; David Shoesmith, Western University; Raul Rebak, General Electric Global Research

Thursday AM
October 3, 2019

Room: B119
Location: Oregon Convention Center

Session Chairs: Matthew Asmussen, Pacific Northwestern National Laboratory; Wilfred Binns, Nuclear Waste Management Organization

8:00 AM
Interaction of Water, Chloride, and Acetic Acid on the Corrosion Behavior of Aluminum in Ethanol Blended Gasoline Fuels: *Ruediger Reitz*[1]; [1]Technische Universität Darmstadt

8:20 AM
Understanding the Effect of Anodic Polarization on SCC Resistance of AA6111 to Simulate Coupling with CFRP for Automotive Applications: *Katrina Catledge*[1]; Jenifer (Warner) Locke[1]; [1]The Ohio State University

8:40 AM
Corrosion Fatigue Performance of AA5456-H116 for In-service versus Laboratory Accelerated Sensitization: *Allison Akman*[1]; David Schrock[1]; Jenifer (Warner) Locke[1]; [1]The Ohio State University

9:00 AM Invited
Characterization, Understanding, and Mitigation of Stress Corrosion Cracking in Al-Mg Alloys: *James Burns*[1]; [1]University of Virginia

9:40 AM
Determination of Corrosion Fatigue Crack Growth Rates of AA 7085-T7451 Utilized in Atmospheric Conditions: *Brandon Free*[1]; Sarah Galyon Dorman[2]; Jason Niebuhr[2]; Jenifer Locke[1]; [1]Fontana Corrosion Center, The Ohio State University; [2]SAFE Inc.

10:00 AM Break

10:15 AM
Effect of Zn2+ Ions on the Corrosion Behavior of the Pure Magnesium in NaCl Solutions: *Jufeng Huang*[1]; Yixing Zhu[1]; Dajiang Zheng[1]; Guang-Ling Song[1]; [1]Xiamen University

10:35 AM
Interactions of Aqueous Surface Treatments with Magnesium Alloy: *Rachel Harris*[1]; Kristi Allen[1]; [1]PPG Industries

10:55 AM
Simultaneously Achieving Superior Mechanical Properties and Corrosion Resistance in Mg Alloys by Advanced Solid Phase Processing: *Vineet Joshi*[1]; Dalong Zhang[1]; Jens Darsell[1]; Darrell Herling[1]; [1]Pacific Northwest National Laboratory

11:15 AM
Surface Alloying of Mg Alloy for Improving Corrosion Resistance and Mechanical Performance: *Yixing Zhu*[1]; Jufeng Huang[1]; Guangling Song[1]; [1]Xiamen University

Emergent Materials under Extremes and Decisive In-situ Characterizations — Pressure-induced Dramatic Changes in Structures and Properties II

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

Thursday AM
October 3, 2019

Room: E145
Location: Oregon Convention Center

Session Chairs: Choong-Shik Yoo, Washington State University; Jesse Smith, Argonne National Laboratory

8:00 AM Invited
Exploring Materials Synthesis, Properties, and Metastability through Rapid (De)Compression: *Jesse Smith*[1]; Guoyin Shen[1]; [1]HPCAT, Argonne National Laboratory

8:30 AM Invited
Structural Transformations Induced at Extreme Conditions: Coupling High-pressure Cells with Energetic Ion Beams: *Maik Lang*[1]; Fuxiang Zhang[2]; Christina Trautmann[3]; Rodney Ewing[4]; [1]University of Tennessee; [2]Oak Ridge National Laboratory; [3]GSI Helmholtzzentrum für Schwerionenforschung; [4]Stanford University

9:00 AM
Pressure-induced Dramatic Changes in Optoelectronic Properties of 2D Halide Perovskites: *Songhao Guo*[1]; Yongsheng Zhao[1]; Wenge Yang[1]; Xujie Lü[1]; [1]HPSTAR

9:20 AM Invited
Structural Stability and Optical Behaviors of Lead Halide Perovskite Nanocrystals at Extremes: *Guanjun Xiao*[1]; Bo Zou[1]; [1]Jilin University

9:50 AM Invited
Pressure-induced Solidification of Water in Dynamic-DAC: *Choong-Shik Yoo*[1]; [1]Washington State University

10:20 AM Break

10:40 AM Panel Discussion

Failure Analysis & Characterization — Microanalysis, Microscopy and Metallography in Failure Analysis (Joint FAS-IMS)

Program Organizers: Andrew Havics, PH2 LLC; James Lane, Rimkus Consulting Group Inc; Burak Akyuz, Applied Technical Services Inc; Pierre Dupont, UMONS, Faculté Polytechnique de MONS (FPMs)

Thursday AM
October 3, 2019

Room: F150
Location: Oregon Convention Center

Session Chairs: Daniel Dennies, DMS, Inc.; Dana Medlin, EAG Laboratories, Inc.; Andrew Havics, pH2, LLC; Burak Akyuz, Applied Technical Services Inc

8:00 AM
Using High-Energy X-ray Diffraction Microscopy to Study In-situ Damage Initiation Mechanisms in Al-Li 2099: *Darren Pagan*[1]; Kelly Nygren[1]; Wesley Tayon[2]; [1]Cornell High Energy Synchrotron Source; [2]NASA Langley Research Center

8:20 AM Invited
Case Studies on Aluminum Failures Caused by Microstructural Abnormalities: *Burak Akyuz*[1]; [1]Applied Technical Services

8:40 AM
A Case of Aluminum Nitride Embrittlement of Heavy Wall Cast Steel: *Joe Maciejewski*[1]; [1]Applied Technical Services

9:00 AM Invited
Investigation of Corrosion of a Hot Water Heater Hose: *Daniel Dennies*[1]; [1]DMS Inc

9:20 AM
Failure Analysis Techniques for Potable Water Components: *Eric Weishaupt*[1]; Ellen Solomon[1]; [1]ESi

9:40 AM Invited
Microscopical Coating Investigations: *Andrew Havics*[1]; [1]PH2 LLC

10:00 AM Break

10:20 AM Invited
Evidence Preservation: ASTM E-1351 Replica Methods & Case History Practice: *Frederick Schmidt*[1]; Brian Schmidt[1]; [1]Advanced APPLIED Services, Inc

10:40 AM
Formation of Defects during Liquid Metal Processing: Consequences and Solutions: *Martin Detrois*[1]; Paul Jablonski[1]; Jeffrey Hawk[1]; [1]National Energy Technology Laboratory

11:00 AM
Crack Propagation in Advanced Materials: Characterizing the Importance of Strain and Chemistry Using EBSD and EDS: *Michael Hjelmstad*[1]; Pat Trimby[1]; Ali Gholinia[2]; Phil Withers[2]; [1]Oxford Instruments; [2]Manchester University

11:20 AM Invited
On the Different Rolling Contact Fatigue Theories and their Use in Industrial Design & FA: *Pierre Dupont*[1]; [1]UMONS, Faculté Polytechnique de MONS (FPMs)

Failure Prevention and Unconventional Failures — Failure Prevention

Program Organizers: Andrew Havics, PH2 LLC; James Lane, Rimkus Consulting Group Inc; Burak Akyuz, Applied Technical Services Inc; Pierre Dupont, UMONS, Faculté Polytechnique de MONS (FPMs)

Thursday AM
October 3, 2019
Room: F149
Location: Oregon Convention Center

Session Chairs: Ronald Parrington , ESI; Michael Connelly, Connelly Consulting; Daniel Grice, Materials Evaluation & Engineering; Mark Russell, Engineering Design & Testing Corporation

8:00 AM
Using Material Science to Understand Seemingly Random Product Failures: *Jeff Ellis*[1]; [1]Battelle

8:20 AM
Human Factors in Control Systems: *Taylor Russell*[1]; [1]Engineering Design & Testing Corp

8:40 AM
Failure Severity Mitigation through the Use of Exception-Handling Devices: *Mark Russell*[1]; [1]Engineering Design & Testing, Corp

9:00 AM
Laboratory Testing of Major Components in Support of Continued Operation: *Michelle Ireland*[1]; Eric Tulk[1]; David Rouison[1]; [1]Kinectrics Inc

9:20 AM Invited
Failure Prevention of High Strength Bolts: *Michael Connelly*[1]; [1]Connelly Consulting

9:40 AM
The Failure Analysis & Prevention of a Large and Critical Extrusion Gearbox : Part 3 - Material, Microstructure & Heat Treatment : Curiosities of Some Gear Teeth: Pierre Dupont[1]; *Donato Firrao*[2]; Paolo Matteis[2]; Maria Rosa Pinasco[2]; Giuseppina Ienco[2]; Fabienne Delaunois[1]; Véronique Vitry[1]; [1]UMONS, Faculté Polytechnique de MONS (FPMs); [2]Politecnico di Torino, Italy

10:00 AM Break

10:20 AM
Radiant Tube Heater Failure Analysis and Resulting Changes to NFPA 54: *Dan Grice*[1]; Larry Hanke[1]; [1]Materials Evaluation and Engineering Inc

10:40 AM
Electrochemical Measurement of Corrosion Protection Using Vapor Corrosion Inhibitors: *Florent Bocher*[1]; [1]Southwest Research Institute

11:00 AM
NTSB Recommendations to Prevent Future Transportation Accidents: *Erik Mueller*[1]; [1]National Transportation Safety Board

11:20 AM
Cold Spray for Cavitation Erosion Protection for Hydropower Applications: *Xiujuan Jiang*[1]; Nicole Overman[1]; Kenneth Ross[1]; [1]Pacific Northwest National Laboratory

Glasses, Optical Materials, and Devices: Current Issues in Science & Technology — Novel Processing and Functional Applications of Glass Materials

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

Thursday AM
October 3, 2019
Room: A106
Location: Oregon Convention Center

Session Chairs: S. K. Sundaram, Alfred University; Jingshi Wu, Corning Inc.

8:00 AM Invited
Managing Laser Damage on Glass Optics in the National Ignition Facility (NIF) Laser: *Tayyab Suratwala*[1]; [1]Lawrence Livermore National Laboratory

8:30 AM Invited
Glass Composition and Temperature Effects on the Result of Ion-exchange Stuffing Process: *Jingshi Wu*[1]; Timothy Gross[1]; Charlene Smith[1]; [1]Corning Inc.

9:00 AM
A Polymer Coating System for Inhibiting Contact-induced Damage in Glass: *Gregory Glaesemann*[1]; Donald Clark[1]; Michael DeRosa[1]; James Matthews[1]; Jennifer Lyon[1]; Kimberly Keegan[1]; [1]Corning Incorporated

9:20 AM
New Moldable Glasses for Multispectral Optics: *Shyam Bayya*[1]; Daniel Gibson[1]; Vinh Nguyen[1]; Jay Vizgaitis[2]; Jas Sanghera[1]; [1]Naval Research Laboratory; [2]Optx Imaging Systems

9:40 AM
A New Method for the Continuous Production of Glass Nanofibres: Continuous Fiberizing by Laser Melting and Supersonic Dragging (CoFibLaS): Félix Quintero[1]; Joaquín Penide[1]; Antonio Riveiro[1]; Jesús del Val[1]; Rafael Comesaña[1]; Fernando Lusquiños[1]; *Juan Pou*[1]; [1]University of Vigo

10:00 AM Break

10:20 AM Invited
Borophosphate Glasses for Biomedical Applications: *Richard Brow*[1]; Parker Freudenberger[1]; Rebekah Blatt[1]; Julie Semon[1]; [1]Missouri University of Science and Technology

10:50 AM
Laser Spinning of 13-93 Bioactive Glass Nanofibers: *Antonio Riveiro*[1]; Félix Quintero[1]; Jesús del Val[1]; Rafael Comesaña[1]; Fernando Lusquiños[1]; Juan Pou[1]; [1]University of Vigo

11:10 AM
Microstructure Evolution in Quick-setting Dental Pulp-capping Materials Made from Calcium Phosphate and Sodium Silicate Glass Microspheres: *Levi Gardner*[1]; Jerry Howard[1]; Krista Carlson[1]; [1]University of Utah

11:30 AM
Investigation of Femtosecond Laser Irradiation of Rare-earth Aluminosilicate Glasses: *David Dobesh*[1]; S.K. Sundaram[1]; [1]Alfred University

Hybrid Organic-Inorganic Materials for Alternative Energy — Hybrids for Alternative Energy II

Program Organizers: Andrei Jitianu, Lehman College, City University of New York; Lisa Klein, Rutgers University; Lia Stanciu, Purdue University; Mihaela Jitianu, William Paterson University

Thursday AM
October 3, 2019
Room: E147
Location: Oregon Convention Center

Session Chair: Sayantani Ghosh, University of California, Merced

8:00 AM Invited
Preparation of Hybrid Nanomaterials and Nanostructured Thin Films using Microreactor-assisted Nanomaterial Synthesis and Deposition Process: *Chih-Hung Chang*[1]; [1]Oregon State University

8:30 AM Invited
The Viability of Hybrid Organic-inorganic Perovskites in Solar Energy Harvesting: *Sayantani Ghosh*[1]; [1]University of California Merced

9:00 AM Invited
Metal Promoted Mo6S8 Clusters: A Platform for Probing Ensemble Effects on the Selective Conversion of CO2 and CO to Methanol: *Jesus Velazquez*[1]; Joseph Perryman[1]; Forrest Hyler[1]; Jessica Ortiz[1]; Ambarish Kulkarni[1]; [1]University of California, Davis

9:30 AM
Effects of Pressure on the Photoconversion Efficiencies of Perovskite Solar Cells: *Oluwaseun Oyewole*[1]; Omolara Oyelade[1]; Deborah Oyewole[1]; Sharafadeen Adeniji[1]; Winston Soboyejo[1]; [1]Worcester Polytechnic Institute

9:50 AM
Effect of Thermal Annealing and Pressure Enhancement of the Efficiency of Bulk Heterojunction Organic Solar Cells: *Deborah Oyewole*[1]; Oluwaseun Oyewole[1]; Kenneth Evans-Lutterodt[2]; Winston Soboyejo[1]; [1]Worcester Polytechnic Institute; [2]Brook-Haven National Laboratory

10:10 AM
A First-principles Study on Improvement of Perovskite-based Solar Cell Materials: *Evan Wang*[1]; Xuan Luo[1]; [1]National Graphene Research and Development Center

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

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

Thursday AM
October 3, 2019
Room: G132
Location: Oregon Convention Center

Session Chairs: Jette Oddershede, Xnovo Technology ApS; Jean-Charles Stinville, University of California, Santa Barbara

8:00 AM Invited
Measurements of Plastic Localization in Polycrystalline Materials in Relation to 3D Microstructure: *Jean-Charles Stinville*[1]; P. G. Callahan[1]; M. A. Charpagne[1]; M. P. Echlin[1]; E.R. Yao[1]; J. Shin[1]; F. Wang[1]; P. Villechaise[2]; J. Cormier[2]; D. Texier[3]; V. Valle[2]; D.S. Gianola[1]; T. M. Pollock[1]; [1]University of California, Santa Barbara; [2]Institut P' - UPR 3346, CNRS - Université de Poitiers - ENSMA; [3]Institut Clément Ader - UMR CNRS 5312

8:30 AM Invited
Towards Rapid Throughout Measurement of Grain Boundary Properties: Jin Zhang[1]; David Rowenhorst[2]; Akinori Yamanaka[3]; Henning Poulsen[4]; *Peter Voorhees*[1]; [1]Northwestern University; [2]Naval Research Laboratory; [3]Tokyo University of Agriculture and Technology; [4]Technical University of Denmark

9:00 AM
Orientation Specific Deformation Behavior of Twins in Mg Alloy AZ31: *Chaitanya Paramatmuni*[1]; Fionn Dunne[1]; [1]Imperial College London

9:20 AM
A New Method for Calculating Stress Fields Generated from Heterogeneous Plastic Deformation Using High-Energy X-ray Diffraction and Field Dislocation Mechanics: *Darren Pagan*[1]; Armand Beaudoin[2]; [1]Cornell High Energy Synchrotron Source; [2]University of Illinois at Urbana-Champaign

9:40 AM
Measurement of the Thermal Expansion of Ti-7Al using High Energy X-Ray Diffraction Microscopy: *Rachel Lim*[1]; Darren Pagan[2]; Joel Bernier[3]; JY Peter Ko[2]; Anthony Rollett[1]; [1]Carnegie Mellon University; [2]Cornell High Energy Synchrotron Source; [3]Lawrence Livermore National Laboratory

10:00 AM Break

10:20 AM Invited
Mapping Grain Morphology and Orientation by Laboratory Diffraction Contrast Tomography: *Jette Oddershede*[1]; Jun Sun[1]; Florian Bachmann[1]; Hrishikesh Bale[2]; William Harris[2]; Erik Lauridsen[1]; [1]Xnovo Technology; [2]Carl Zeiss X-ray Microscopy Inc.

10:50 AM Invited
Mapping of Geometrically Necessary Dislocation Densities using Electron Backscattering Diffraction: *Travis Skippon*[1]; [1]Canadian Nuclear Laboratories

11:20 AM
Backtracking 5DOF Grain Boundary Hydrogen Diffusivities in Iron: Experimentation, Localization Techniques, and Inverse Problem Theory: *Sterling Baird*; Christian Kurniawan[1]; Tyler Critchfield[1]; David Page[1]; Katie Varela[1]; David Fullwood[1]; Eric Homer[1]; Oliver Johnson[1]; [1]Brigham Young University

11:40 AM
Imaging Microplasticity Events by Combining High Energy Diffraction Microscopy and Bragg Coherent Diffraction Imaging: *Matthew Wilkin*[1]; Anthony Rollett[1]; [1]Carnegie Mellon University

International Symposium on Ceramic Matrix Composites — CMC III

Program Organizers: Narottam Bansal, National Aeronautics and Space Administration; Jacques Lamon, LMT-Cachan, CNRS; Sung Choi, Naval Air Systems Command; J. P. Singh, US Army Research Laboratory (Retired)

Thursday AM
October 3, 2019
Room: A103
Location: Oregon Convention Center

Session Chair: Elizabeth Opila, University of Virginia

8:30 AM Invited
Oxidation Behavior and Mechanical Properties of Melt-infiltrated SiC/SiC Ceramic Matrix Composites over a Wide Temperature Range: Kaitlin Detwiler[1]; Megan Wilson[1]; Jennifer Pierce[2]; *Elizabeth Opila*[1]; [1]University of Virginia; [2]University of Dayton Research Institute

9:10 AM
Processing and Corrosion Behavior of Zirconium-based Composites: *Michael Kloesel*[1]; Christopher Kha[1]; Spencer Swartzbaugh[1]; Vilupanur Ravi[1]; [1]Cal Poly Pomona

9:30 AM
Orientation Dependence of Indentation Behavior in PVD Nitrides Nanoscale Multilayer Coatings: *Jiao Chen*[1]; Jun Yang[1]; Lu Zhang[1]; [1]Xi'an Jiaotong University

9:50 AM
Higher Temperature Composites based on Zirconium Cements: *Nicolai Ilyoukha*[1]; [1]Academic Ceramic Ctr

10:10 AM
Development of Sugarcane Bagasse Reinforced Onibode Clay Composite for High Voltage Insulation: Joseph Agboola[1]; Suleiman Hassan[2]; Afeez Luqman[3]; [1]Federal University of Technology, Minna; [2]Nigerian Institute of Mining and Geosciences; [3]University of Lagos

Joining of Advanced and Specialty Materials XXI — Dissimilar Materials Joining

Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee; Hiroaki Mori, Osaka University; Yuri Hovanski, Brigham Young University; Darren Barborak, WeldQC Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell; Zhenzhen Yu, Colorado School of Mines

Thursday AM
October 3, 2019
Room: Portland Ballroom 252
Location: Oregon Convention Center

Session Chair: Zhenzhen Yu, Colorado School of Mines

8:00 AM Invited
Effects of Weld Cladding Processes on Wear Behaviour of Overlays for Mining Applications: *Sheng-Hui Wang*[1]; [1]National Research Council Canada

8:30 AM
Development of Dissimilar Metal Joints Porosity Evaluation Method: *Dmitrii Kurushkin*[1]; Igor Mushnikov[1]; Evgenii Rylkov[1]; Fedor Isupov[1]; Oleg Panchenko[1]; [1]Peter the Great Saint Petersburg Polytechnic University

8:50 AM
Mechanical Performance of Welded INCONEL® Alloy 740H ® Product Forms: *John Shingledecker*[1]; John deBarbadillo[2]; Brian Baker[2]; [1]Epri; [2]Special Metals Corp.

9:10 AM
Dissimilar Joining of Steel and Aluminum Alloys by Electrically Assisted Pressure Joining: *Shengwei Zhang*[1]; Sung-Tae Hong[1]; Kun Gao[1]; Heung Nam Han[2]; [1]University of Ulsan; [2]Seoul National University

9:30 AM
Process-structure-property Relationship in Dissimilar Al-high Strength Steel Impact Spot Welds: *Angshuman Kapil*[1]; Anupam Vivek[1]; Glenn Daehn[1]; [1]Ohio State University

9:50 AM
Direct Fabrication of Bimetallic Ti6Al4V+Al12Si Structures via Additive Manufacturing: *Yanning Zhang*[1]; Amit Bandyopadhyay[1]; [1]Washington State University

10:10 AM Break

10:30 AM
Effect of Nb Interlayer on the Stability Against High-temperature Exposure in Impact Spot Welding of Ti to Stainless Steel: *Jianxiong Li*[1]; Anupam Vivek[1]; Glenn Daehn[1]; [1]Ohio State University

10:50 AM
Effect of Surface Roughness on Bonding Behavior of Steel and Ni by Ultrasonic Welding: *Shoichi Nambu*[1]; Jheyu Lin[1]; Toshihiko Koseki[1]; [1]The University of Tokyo

Light Metal Technology — Processing Technology II

Program Organizers: Xiaoming Wang, Purdue University; Alan Luo, Ohio State University; Kumar Sadayappan, Canmet MATERIALS

Thursday AM
October 3, 2019
Room: D138
Location: Oregon Convention Center

Session Chair: Lukas Bichler, University of British Columbia

8:00 AM
Computational Simulation and Experimental Validation of Precipitation Microstructure and Strengthening in Mg-Al-Sn Based Alloys: *Alan Luo*[1]; Jiashi Miao[1]; Chuan Zhang[2]; Fan Zhang[2]; [1]Ohio State University; [2]CompuTherm LLC

8:20 AM
Investigation on Graphene Reinforced Magnesium Matrix Composites Synthesized by Powder Metallurgical Method: *Zhaohui Wang*[1]; Yong Zhuang[1]; Xian Du[1]; Wenbo Du[1]; [1]Beijing University of Technology

8:40 AM
The use of Laser Ultrasonics for Metallurgy for *In-situ* Measurements of Phase Transformation Kinetics in Titanium Alloys: *Mariana Rodrigues*[1]; Matthias Militzer[1]; [1]The University of British Columbia

9:00 AM
A Discrete Dislocation Loop Based Model to Study Elastic Response of a Twin: *Yubraj Paudel*[1]; Christopher Barrett[1]; Haitham El Kadiri[1]; [1]Mississippi State University

9:20 AM
Effect of Rare Earth Oxide Nanoparticles on the Mechanical and Biological Properties of Magnesium: *Milli Suchita Kujur*[1]; Vyasaraj Manakari[2]; Gururaj Parande[2]; Somasundaram Prasadh[2]; Raymond Wong[2]; Ashis Mallick[3]; Manoj Gupta[2]; [1]Indian Institute of Technology (Indian School of Mines); National University of Singapore; [2]National University of Singapore; [3]Indian Institute of Technology (Indian School of Mines)

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

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

Thursday AM
October 3, 2019
Room: C126
Location: Oregon Convention Center

Session Chairs: Gurbinder Kaur; James Cahoon, UNC Chapel Hill; Gary Pickrell, Virginia Tech; Navin Manjooran, Solve Technology and Research, Inc.

8:00 AM Keynote
Designing Silicon Nanostructures to Harvest Energy: From Asymmetric Electron Ratchets to Decuple-junction Photovoltaics: *James Cahoon*[1]; [1]University of North Carolina at Chapel Hill

8:40 AM
Using Energy Filtering to Change the Thermoelectric Design Paradigm: Seyed Aria Hosseini[1]; Devin Coleman[1]; Lorenzo Mangolini[1]; *Alex Greaney*[1]; [1]University of California, Riverside

9:00 AM
Synthesis, Characterization, and Catalytic Activity of Bismuth Ruthenium Oxide Nanoparticles for Oxygen Evolution and Reduction: Chinami Iketani[1]; Shohei Yamaguchi[1]; Kenji Kawaguchi[1]; *Masatsugu Morimitsu*[1]; [1]Doshisha University

9:20 AM
Ternary Hierarchical Microstructures for Supercapacitor Applications: *Aadithya Jeyaranjan*[1]; Tamil Selvan Sakthivel[1]; Sudipta Seal[1]; [1]Univ of Central Florida

9:40 AM
The Preparation and Electrochemical Performance of Tin based Material:SnTe: *Xiong Zhang*[1]; [1]Hubei University of Automotive Technology

10:00 AM Break

10:20 AM
Thermally Tailoring the Crystal Structure and Defect Disorder in Titanium Oxide Nanotubes for Enhanced Electrocatalysis While Maintaining the Nanostructure: *Hammad Malik*[1]; Krista Carlson[1]; Swomitra Mohanty[1]; [1]University of Utah

10:40 AM
Self-Assembled Li3V2(PO4)3/Reduced Graphene Oxide Multilayer Nanocomposite Prepared by Sequential Adsorption for Lithium Ion Storage: *Kwang-Bum Kim*[1]; [1]Yonsei University

11:00 AM Concluding Comments

Next Generation Biomaterials — Next Generation Biomaterials VI

Program Organizers: Roger Narayan, University of North Carolina; Federico Rosei, INRS Centre for Energy, Materials and Telecommunications

Thursday AM
October 3, 2019
Room: C122
Location: Oregon Convention Center

Session Chairs: Hitesh Vora, Oklahoma State University; Vamsi Balla , CSIR-Central Glass & Ceramic Research Institute; Xanthippi Chatzistavrou, Michigan State University

8:00 AM
Synthesis of PLA-Steel Polymeric Composite through Fused Deposition Modeling based Additive Manufacturing Process for Bio Applications: Jon Bramsch[1]; *Hitesh Vora*[1]; [1]Oklahoma State University

8:20 AM Invited
Micro-to-nano-scale Surface Roughening of 3Y-TZP for Improved Osseointegration and Antibacterial Response: Andraz Kocjan[1]; Juliane Moritz[2]; *Anže Abram*[1]; Aleš Dakskobler[3]; Karolina Ivicak Kocjan[4]; [1]Jožef Stefan Institute; [2]Fraunhofer IWS; [3]Vall-Cer d.o.o.; [4]National Institute of Chemistry

8:40 AM
Soft-tissue Mimicking Simulants using SEBS as Next Generation Biomaterial for Medical Applications: *Yao Chen*[1]; Mahdieh Babaiasl[1]; Fan Yang[1]; John Swensen[1]; Jow-Lian Ding[1]; [1]Washington State University

9:00 AM
Highly Elastomeric Poly (Glycerol Sebacate)-co-Poly(Methyl Acrylate) Copolymer Based Electrospun Nanofibrous Patch for Tissue Engineering Applications: Aniruddha Pal[1]; Aishwarya Satpathy[1]; Chandra Khatua[1]; *Vamsi Balla*[2]; Ananya Barui[3]; Subhadip Bodhak[1]; [1]CSIR-Central Glass and Ceramic Research Institute; [2]University of Louisville; [3]Indian Institute of Engineering Science and Technology

9:20 AM
Liquid Crystal Elastomers as a Biomaterial and Applications: *Mitchell Anderson*[1]; Carl Frick[1]; [1]University of Wyoming

9:40 AM
Lost Salt Templating of Zn Porous Scaffolds for Bone Tissue Engineering: Irsalan Cockerill[1]; *Marcus Young*[1]; Donghui Zhu[1]; [1]University of North Texas

10:00 AM Break

10:20 AM
Investigation on In Vitro and In Vivo Biological Response of Ti-Ta Alloys: *Indranath Mitra*[1]; Amit Bandyopadhyay[1]; Susmita Bose[1]; [1]Washington State University

10:40 AM Invited
Acoustic Radiation Force-Derived Bone Formation within a Biodegradable Hydrogel Enhances Bone Formation: *Yusuf Khan*[1]; [1]University of Connecticut

11:00 AM Invited
Design of Biomaterials by Simulation and Experiment: Molecular Recognition, Assembly, and Applications: *Hendrik Heinz*[1]; [1]University of Colorado-Boulder

11:20 AM Invited
Imaging Live Cell-Nanopatterned Substrate Interactions Utilizing Reflective Confocal Microscopy: *Emily Kinser*[1]; [1]3 M Company

11:40 AM Invited
Innate Glycosidic Activity in Metallic Implants for Device Targeted Therapy: *Jeremy Schaffer*[1]; Marja ter Meer[2]; Ross Dillion[1]; Signe Maria Nielsen[3]; Raoul Walther[3]; Rikke Meyer[3]; Willeke Daamen[2]; Lambertus van den Heuvel[4]; J. Adam van der Vliet[2]; Roger Lomme[2]; Yvonne Hoogeveen[2]; Leo Schultze Kool[2]; Alexander Zelikin[3]; [1]Fort Wayne Metals Research Products Corp.; [2]Radboud University Medical Center; [3]Aarhus University; [4]Radboud University Medical Center; Catholic University Leuven

Phase Transformations in Ceramics: Science and Applications — Prediction and Novel Methods II

Program Organizers: Pankaj Sarin, Oklahoma State University; Waltraud Kriven, University of Illinois at Urbana-Champaign; Sanjay Khare, University of Toledo; Yu Zhong, Worcester Polytechnic Institute

Thursday AM
October 3, 2019
Room: A104
Location: Oregon Convention Center

Session Chairs: Sanjay Khare, University of Toledo; Waltraud Kriven, University of Illinois at Urbana-Champaign

8:00 AM Invited
First-principles Investigation of Phonon Instabilities and Displacive Phase Transitions in $CaTiO_3$-perovskites: *Venkateswara Manga*[1]; Thomas Zega[1]; Krishna Muralidharan[1]; [1]University of Arizona

8:40 AM Invited
First Principles Investigation into the Phase Stability and Enhanced Hardness of TiN-ScN and TiN-YN Alloys: Vijaya Adhikari[1]; Nathan Szymanski[1]; Indiras Khatri[1]; Daniel Gall[2]; *Sanjay Khare*[1]; [1]University of Toledo; [2]Rensselaer Polytechnic Institute

9:10 AM Invited
Prediction of Diffusionless Phase Transformation by Determination of the Orientation Relationship, Shear, and Motif Translation with the Smallest Atom Shuffles: *Randall Hay*[1]; Emmanuel Boakye[1]; Pavel Mogilevsky[1]; Thomas Key[1]; [1]USAF

9:50 AM Break

10:10 AM Invited
Topotactic Motif and Orientation Relation Extraction for Phase Transformations from In-situ X-ray Powder Diffraction: Scott Mc Cormack[1]; *Waltraud Kriven*[1]; [1]University of Illinois at Urbana-Champaign

10:50 AM Invited
In-situ Phase Diagram Determination of the HfO2-Ta2O5-TiO2 Ternary Up to 3000 °C: *Scott Mccormack*[1]; Ben Hulbert[1]; Richard Weber[2]; Sergey Ushakov[3]; Alexandra Navrotsky[3]; Waltraud Kriven[1]; [1]University of Illinois Urbana-Champaign; [2]Materials Development Inc.; [3]University of California Davis

Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals — Powder Metallurgy of Superalloys, Amorphous Metal Powder and Molybdenum-Silicon-Boron Alloy

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

Thursday AM
October 3, 2019
Room: D135
Location: Oregon Convention Center

Session Chair: Peng Yu, Southern University of Science and Technology

8:00 AM
The Research on Improve the Mechanical Property by Selective Formation of Y-Ti-O Complex Oxide in Ni-based ODS Alloy: *Chun Woong Park*[1]; Won June Choi[1]; Jong Min Byun[2]; Young Do Kim[1]; [1]Hanyang University; [2]Seoul National University of Science and Technology

8:20 AM Invited
Soft Magnetic Properties of Amorphous Metal Powders Fabricated by Gas-atomization Process: *Yong-Jin Kim*[1]; Jae Won Chung[1]; Dong-Yeol Yang[1]; Sangsun Yang[1]; Ki Bong Kim[1]; Min Ha Lee[2]; Hwi Jun Kim[2]; [1]Korea Institute of Materials Science; [2]Korea Institute of Industrial Technology

8:40 AM Invited
The Influence of Atomisation Route and Powder Characteristics on the Microstructural and Mechanical Properties Development of HIPped IN625 Ni-Superalloy: Alessandro Sergi[1]; Alessandro Abena[1]; Raja Khan[2]; Khamis Essa[1]; *Moataz Attallah*[1]; [1]University of Birmingham; [2]TWI Ltd

9:00 AM Invited
Powder Processing Mo-Si-B for High Strength and Low Temperature Toughness: *Peter Marshall*[1]; Sharvan Kumar[2]; Xiang Yu[2]; [1]Imaging Systems Technology; [2]Brown University

PSDK XIV: Phase Stability and Diffusion Kinetics — Software Development

Program Organizers: Michael Gao, National Energy Technology Laboratory; Hans Seifert, Karlsruhe Institute of Technology; Zi-Kui Liu, Pennsylvania State University; Fan Zhang, CompuTherm LLC; Richard Otis, Jet Propulsion Laboratory; Aurelien Perron, Lawrence Livermore National Laboratory

Thursday AM — Room: E144
October 3, 2019 — Location: Oregon Convention Center

Session Chairs: Richard Otis, The Jet Propulsion Laboratory; Fan Zhang, Computherm LLC

8:00 AM Invited
Automated CALPHAD Modeling and Uncertainty Quantification of a Ternary System Using ESPEI: *Brandon Bocklund*[1]; Richard Otis[2]; Zi-Kui Liu[1]; [1]Pennsylvania State University; [2]California Institute of Technology

8:30 AM Invited
High-speed High-throughput Thermodynamic and Phase Equilibrium Calculation and Its Application in Phase Field Simulation: *Shuanglin Chen*[1]; Dongke Sun[2]; Weisheng Cao[1]; Duchao Lv[1]; Fan Zhang[1]; Kamal Kadirvel[3]; Yunzhi Wang[3]; [1]CompuTherm LLC; [2]Southeast University; [3]Ohio State University

9:00 AM Invited
PFHub: The Phase Field Community Hub: *Daniel Wheeler*[1]; [1]National Institute of Standards & Tech

9:30 AM Invited
Using Thermodynamic Databases in Mesoscale Microstructure Modeling with MOOSE: *Daniel Schwen*[1]; Chao Jiang[1]; Larry Aagesen[1]; [1]Idaho National Laboratory

10:00 AM Break

10:20 AM Invited
Development of an Integrated FEM and Phase Field Approach for Modeling Additive Manufacturing: *Daniel Lewis*[1]; Antoinette Maniatty[1]; [1]Rensselaer Polytechnic Institute

10:50 AM Invited
PDUQ – Phase Diagram Uncertainty Quantification in Python: *Noah Paulson*[1]; Brandon Bocklund[2]; Richard Otis[3]; Zi-Kui Liu[2]; Marius Stan[1]; [1]Argonne National Laboratory; [2]Pennsylvania State University; [3]Jet Propulsion Laboratory, California Institute of Technology

Sandphobic Thermal/Environmental Barrier Coatings — Sandphobic Thermal/Environmental Barrier Coatings II

Program Organizers: Michael Walock, U.S. Army Research Laboratory; Andy Nieto, US Army Research Laboratory; Clara Mock, US Army Research Laboratory; Anindya Ghoshal, US Army Research Laboratory; Muthuvel Murugan, US Army Research Laboratory; Marc Pepi, US Army Research Laboratory

Thursday AM — Room: C120
October 3, 2019 — Location: Oregon Convention Center

Session Chairs: Andy Nieto, Naval Postgraduate School; Nishan Jain, University of Maryland

8:00 AM
Army Advances in Sandphobic Thermal/Environmental Barrier Coatings: Michael Walock[1]; *Clara Mock*[1]; Andy Nieto[2]; Andrew Wright[3]; Anindya Ghoshal[1]; Jian Luo[3]; Muthuvel Murugan[1]; Marc Pepi[1]; [1]US Army Research Laboratory; [2]Naval Postgraduate School; [3]University of California at San Diego

8:20 AM Invited
CMAS-Resistant YSZ-rare Earth Oxide Composite Coatings: *Clara Mock*[1]; Michael Walock[2]; Anindya Ghoshal[2]; Muthuvel Murugan[2]; Marc Pepi[2]; [1]ORAU; [2]U.S. Army Research Laboratory

8:50 AM Invited
Numerical Investigation of Particle Deposition in Gas Turbine Blades: *Nishan Jain*[1]; Luis Bravo[2]; Anindya Ghoshal[2]; Muthuvel Murugan[2]; Alison Flatau[1]; Michael Walock[2]; [1]University of Maryland; [2]U.S. Army Research Laboratory

9:20 AM Invited
Non-silicate Ceramic T-EBC Coatings for SiC CMCs: *Larry Fehrenbacher*[1]; [1]Technology Assessment & Transfer Inc.

9:50 AM Break

10:00 AM Invited
CMAS Removal by Spectrally Guided Laser Ablation: *Eric Jordan*[1]; Michael Renfro[2]; [1]University of Connecticut; [2]University Kentucky

10:30 AM
Processing of Laser Surface Modification of Functionally Graded Alumina/CYSZ Thermal Barrier Coating: *Fatih Kirbiyik*[1]; Gultekin Goller[1]; [1]Istanbul Technical University

10:50 AM Invited
High Resolution Non-invasive Characterization of Calcium-magnesium-alumino-silicate Infiltration in Thermal Barrier Coatings: Zachary Stein[1]; Sandip Haldar[1]; Chance Barrett[1]; Johnathan Hernandez[1]; Laurene Tetard[1]; Ravisankar Naraparaju[2]; Uwe Schulz[2]; *Seetha Raghavan*[1]; [1]University of Central Florida; [2]DLR-German Aerospace Center

11:20 AM Concluding Comments

Sintering and Related Powder Processing Science and Technologies — SPS Sintering

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

Thursday AM — Room: E142
October 3, 2019 — Location: Oregon Convention Center

Session Chairs: Ricardo Castro, University of California, Davis; Rosario Gerhard, GeorgiaTech

8:00 AM
Spark Plasma Sintered Aluminum Oxide Filter for Hot Gas Applications: *Catalina Young*[1]; Cheng Zhang[1]; Benjamin Boesl[1]; Arvind Agarwal[1]; [1]Florida International University

8:20 AM
Spark Plasma Sintering of Soft Magnetic Materials: *Taban Larimian*[1]; Tushar Borkar[1]; [1]Cleveland State University

8:40 AM
Characterization of Functionally Graded Rods with High Strength, Good Wear Resistance and Ductility of Titanium Matrix Composites Prepared by Spark Plasma Extrusion: *Keisuke Kanazawa*[1]; Naoya Hosokawa[1]; Hiroki Saito[1]; Hiroshi Izui[1]; Yoshiki Komiya[1]; [1]Nihon University

9:00 AM
Development of Tungsten Based Plates by Spark Plasma Sintering: *Dibyendu Chakravarty*[1]; Vijay Ravula[1]; [1]ARCI

9:20 AM
A Novel Approach to Boriding of TZM by Spark Plasma Sintering Method: *Baris Yavas*[1]; Gultekin Goller[1]; [1]Istanbul Technical University

9:40 AM
Production and Characterization of AlON Ceramics with Different Amount of MgO Addition via Reactive Spark Plasma Sintering: *Demet Aydogmus*[1]; Gultekin Goller[1]; Onuralp Yucel[1]; Filiz Sahin[1]; [1]Istanbul Technical University

10:00 AM Break

10:20 AM
Kinetics and Densification Behavior during Reaction Sintering of Bulk Titanium Boride (TiB) Nanoceramics by Spark Plasma Sintering (SPS): Jun Du[1]; *K.S. Ravi Chandran*[1]; [1]University of Utah

10:40 AM
Microstructural Observation and Mechanical Properties of B4C Based Composites Reinforced with CrCoFeMoNi High Entropy Alloy Prepared by Spark Plasma Sintering: *Burak Cagri Ocak*[1]; Gultekin Goller[1]; [1]Istanbul Technical University

11:00 AM
Investigation the Effect of CNT and GNP Additions on Densification, Microstructure and Mechanical Properties of B4C Prepared by Spark Plasma Sintering: *Erdem Balci*[1]; Onuralp Yucel[1]; Ipek Akin[1]; Filiz Sahin[1]; Gultekin Goller[1]; [1]Istanbul Technical University

11:20 AM
Production and Characterization of B4C- ZrB2 Composites via Spark Plasma Sintering Method: *Leyla Yanmaz*[1]; Gultekin Goller[1]; Onuralp Yucel[1]; Filiz Sahin[1]; [1]Istanbul Technical University

11:40 AM
Spark Plasma Sintering of Titanium Diboride Ceramics with Different Amount of Titanium Addition: *Tugce Dedeagacli*[1]; Gultekin Goller[1]; Onuralp Yucel[1]; Filiz Sahin[1]; [1]Istanbul Technical University

Synthesis, Characterization, Modeling 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 (NIST); Kevin Huang, University of South Carolina

Thursday AM
October 3, 2019

Room: D139
Location: Oregon Convention Center

Session Chair: Winnie Wong-Ng, National Institute of Standards and Technology

8:00 AM Invited
Physisorbent Coated Sensors for Remote Leak Detection of CH4: *Jeffrey Culp*[1]; Tao Hong[1]; Ki-Joong Kim[1]; Jagannath Devkota[1]; Paul Ohodnicki[1]; [1]National Energy Technology Laboratory

8:20 AM Invited
3-D Topology of Micropores, Voids, and Channels in Selected Crystalline Porphyrins.: *Lawrence Cook*[1]; Greg Brewer[1]; Winnie Wong-Ng[2]; Matthew Lawson[3]; Lan Li[3]; [1]The Catholic University of America; [2]The National Institute of Standards and Technology; [3]Boise State University

8:40 AM
A Modified Scaling Law for Stiffness of Nanoporous Materials Accounting for Deformation Mode Effects of Nodes and Ligaments: Haomin Liu[1]; *Niaz Abdolrahim*[1]; [1]University of Rochester

9:00 AM
Stochastic Mechanical Modeling of Nanoporous Materials Accounting for Connectivity and Mixed Loading States: *Mujan Seif*[1]; Skylar Mays[1]; Thomas Balk[1]; Matthew Beck[1]; [1]University of Kentucky

9:20 AM
Oriented Growth of Covalent Organic Framework (COF) Films on Metal-hydroxides Thin Film: *Ken Ikigaki*[1]; Kenji Okada[1]; Yasuaki Tokudome[1]; Paolo Falcaro[2]; Christopher Coleman[3]; Andrew Tarzia[3]; Christian Doonan[3]; Masahide Takahashi[1]; [1]Osaka Prefecture University; [2]Graz University of Technology; [3]University of Adelaide

9:40 AM
Modeling of the Processes of Obtaining Porous Materials under SHS Conditions: *Borys Sereda*[1]; Yuriy Belokon[1]; Dmytro Sereda[1]; Irina Kruglyak[1]; Karina Belokon[1]; [1]Dneprovsky State Technical University

10:00 AM Concluding Comments

Thermomechanical Processing in Shaping and Forming of Steels — Thermomechanical Processing in Shaping and Forming of Steels II

Program Organizers: Evgueni Poliak, Arcelormittal; Amy Clarke, Colorado School of Mines; Kester Clarke, Colorado School of Mines; Pello Uranga, CEIT and TECNUN (University of Navarra)

Thursday AM
October 3, 2019

Room: C123
Location: Oregon Convention Center

Session Chairs: Kester Clarke, Colorado School of Mines; Evgueni Poliak, ArcelorMittal East Chicago; Pello Uranga, CEIT; Amy Clarke, Colorado School of Mines

8:00 AM
Characterizing Longitudinal Defects in Steel Continuous Casting: *Matthew Zappulla*[1]; Brian Thomas[1]; [1]Colorado School of Mines

8:20 AM
Effect of Vanadium and Aluminum Grain Refining Treatment on Steel Machinability: Xueliang Zhang[1]; *Simon N. Lekakh*[1]; Ronald J. O'Malley[1]; Eduardo Scheid[2]; Mark Emmendorfer[3]; Mike Fox[4]; [1]Missouri University of Science and Technology; [2]Gerdau Special Steel North America; [3]Metaltek International; [4]Gerdau Long Steel North America

8:40 AM
Evolution of Inclusions in Solid Steel during Reheating Process: Weifu Li[1]; Ying Ren[1]; Jujin Wang[1]; *Lifeng Zhang*[1]; [1]University of Science and Technology Beijing

9:00 AM
Some Aspects of Industrial Thermomechanical Processing of Steels: *Evgueni Poliak*[1]; [1]Arcelormittal

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 poster during their designated presentation time.

All poster sessions will be held on Tuesday, October 1

Poster Session I (P1) – 11:00 a.m. – 12:00 p.m.

- Biomaterials
- Ceramic and Glass Materials
- Electronic & Magnetic Materials
- Failure Analysis
- Modeling
- Nanomaterials
- Special Topics

Poster Session II (P2) – 12:00 p.m. – 1:00 p.m.

- Fundamentals and Characterization
- Processing and Manufacturing

Poster Session III (P3) – 4:45 p.m. – 5:45 p.m.

- Additive Manufacturing
- Energy
- Iron and Steel (Ferrous Alloys)
- Materials-Environmental Interactions

Advanced Biomaterials for Biomedical Implants and Biosensing Devices — Poster Session

Program Organizers: Tolou Shokuhfar, University of Illinois at Chicago; Sahar Vahabzadeh, Northern Illinois University

Tuesday AM
October 1, 2019
11:00 AM-12:00 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P1-1: Electrochemical Evaluation of Ti-13Nb-13Zr-B Alloys for Knee Implants: *Thu Nguyen*[1]; Jacob Giacomi[1]; Armando Shehi[1]; Vilupanur Ravi[1]; [1]Cal Poly Pomona

P1-2: The Consequence of Microwave Settings on Condensation of HAP: *Aida Faeghinia*[1]; Touraj Ebadzadeh[1]; [1]Materials and Energy Research Center

Advances in Dielectric Materials and Electronic Devices — Poster Session

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

Tuesday AM
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P1-39: 1-3 Magnetoelectric Composites for Magnetic Field Detection: Julio Cesar Pastoril[1]; Anuar Mincache[1]; Gustavo Dias[1]; Ivair Santos[1]; Ruyan Guo[2]; Amar Bhalla[2]; *Luiz Cotica*[1]; [1]State University of Maringa; [2]University of Texas at San Antonio

P1-40: Bio-based Composite for Anechoic Chamber Absorbers Application: *Ratiba Benzerga*[1]; Chloé Méjean[1]; Ala Sharaiha[1]; [1]University of Rennes, IETR

P1-41: CoFe2O4:BaTiO3 Magnetoelectric Nanocomposites: Ferroic Properties: *Denise Alanis*[1]; Gustavo Dias[1]; Ivair Santos[1]; Ruyan Guo[2]; Amar Bhalla[2]; Luiz Cótica[2]; [1]State University of Maringá; [2]University of Texas at San Antonio

P1-42: Dipole Engineering: Increasing Material Breakdown Strength and Capacitor Energy: *Liam Saccucci-Bryan*[1]; Genevieve Delfin[1]; Andrew Christie[1]; Dakota Spencer[1]; Kaijie Ning[1]; Soutik Betal[1]; Holly Shulman[1]; Walter Schulze[1]; Steven Pilgrim[1]; Steven Tidrow[1]; [1]Alfred University

P1-43: Effect of Chemical Dispersant and Solvent on the Elaboration of Composites: *Hanadi Breiss*[1]; Ratiba Benzerga[1]; Ala Sharaiha[1]; Ali Harmouch[1]; Akil Jrad[1]; [1]University of Rennes, IETR

P1-44: Electronic Structure of Ceramic Magnets: M- and W-type Hexaferrites: *Minyeong Choi*[1]; Yang-Ki Hong[1]; Hoyun Won[1]; Woncheol Lee[2]; [1]University of Alabama; [2]Samsung Electro-Mechanics Co., Ltd.

P1-45: Extrinsic p-type Doping of Few Layered WS_2 by Pulsed Laser Deposition: *Nigel Shepherd*[1]; Urmilaben Rathod[1]; Andrey Voevodin[1]; [1]University of North Texas

P1-46: Genetic Algorithm for Multilayer Absorption Performance Optimization: *Aicha El Assal*[1]; Ratiba Benzerga[1]; Hanadi Breiss[1]; Ala Sharaiha[1]; Ali Harmouch[1]; Akil Jrad[1]; [1]University of Rennes, IETR

P1-47: Glass Foam Composites for High Power Microwave Absorption: *Ratiba Benzerga*[1]; Vincent Laur[2]; Ronan Lebullenger[3]; Laurent Le Gendre[1]; Ala Sharaiha[1]; [1]University of Rennes, IETR; [2]LabSTICC; [3]ISCR

P1-48: Influence of Fiber Length and Dispersion Process on Dielectric Properties of Carbon Based Composites: Mathieu Badard[1]; Chloé Méjean[1]; Ratiba Benzerga[1]; *Hanadi Breiss*[1]; Claire Le Paven[1]; Ala Sharaiha[1]; [1]University of Rennes, IETR

P1-49: Influence of the PbO-excess in the Ferroelectric Phase Stabilization of PLZT Ceramics: Atair Carvalho da Silva[1]; Elton Carvalho de Lima[2]; Ruyan Guo[3]; Amar Bhalla[3]; *Jose de los Santos Guerra*[1]; [1]Universidade Federal de Uberlandia; [2]Universidade Federal do Tocantins; [3]The University of Texas at San Antonio

P1-50: Inkjet Printable Metal Organic Framework Materials: Ferroelectric UiO-66-(Hf) as Flexible Pressure Sensor: *Maria Monroy Gonzalez*[1]; Bryan Gamboa[1]; Ruyan Guo[1]; Amar Bhalla[1]; [1]University of Texas at San Antonio

P1-51: Original Stoichiometric Perovskite Films Produced by Controlled Oxidation of Oxynitride Material: Mohamad Haydoura[1]; *Claire Le Paven*[1]; Laurent Le Gendre[1]; Ratiba Benzerga[1]; Florent Marlec[1]; Francois Chevire[2]; Franck Tessier[2]; Alain Moreac[3]; [1]University of Rennes, IETR; [2]University of Rennes, ISCR; [3]University of Rennes, IPR

P1-53: Pulsed Laser Deposition of KxNa1-xNbO3 Films on Platinized Silicon Substrates: *Donovan Moses*[1]; Carl Morandi[2]; Kathleen Coleman[1]; Nathan Bishop[1]; Leonard Jacques[1]; Susan Trolier-McKinstry[1]; [1]Penn State University; [2]Georgia Tech

P1-54: Reduction Kinetics of Reactive Silver Inks: Avinash Mamidanna[1]; *Owen Hildreth*[1]; [1]Colorado School of Mines

P1-55; Roadway Energy Harvesting Module Design, Prototype, and Testing for Traffic Data Collection and Optimized Energy Harvesting: George Nall[1]; *Bryan Gamboa*[1]; Maximilian Estrada[1]; Ruyan Guo[1]; Amar Bhalla[1]; [1]University of Texas, San Antonio

P1-56: Structural, Dielectric and Ferroelectric Properties of Morphotropic Phase Boundary in Lead-free $Na_{0.4}K_{0.1}Bi_{0.5}TiO_3$ System: *N Shara Sowmya*[1]; Pravin Varade[1]; N. Venkataramani[1]; Ajit R. Kulkarni[1]; [1]Indian Institute of Technology - Bombay

P1-57: Study of the Optical Properties of PVDF Neodymium Doped Samples: *Evaristo Falcao*[1]; Lais Aguiar[2]; Ruyan Guo[3]; Amar Bhalla[3]; [1]Federal University of Grande Dourados; [2]State University of Maringa; [3]University of Texas at San Antonio

P1-58: Thermopower Determination Using Pyrolytic Graphite and Aluminum Thermocouple: *Abdul-Sommed Hadi*[1]; Bryce Hill[1]; [1]Montana Technological University

P1-59: Update: Capacitive Thermal-to-Electric Energy Conversion Devices: *Soutik Betal*[1]; Walter Schulze[1]; Steven Pilgrim[1]; Steven Tidrow[1]; [1]Alfred University

P1-60: X-ray Absorption Near K-edge inRrare-earth Doped Barium Titanate: *Abrahan Pablo Aslla Quispe*[1]; Roberto Hiroki Miwa[1]; Jose de los Santos Guerra[1]; [1]Universidade Federal de Uberlandia

P1-129: Study of the Multi-phase Aqueous Solutions for Non-isothermal Conditions Using the Complex Permittivity in the Microwave Range: *Carlos Acosta*[1]; Amar Bhalla[1]; Ruyan Guo[1]; [1]University of Texas at San Antonio

P1-130: Study of the Optical and Electrical Properties of KNbO3-based Ferroelectric Ceramics: *Jose de los Santos Guerra*[1]; A. C. Silva[2]; M. A. Oliveira[2]; Y. Mendez-González[3]; A. F. G. Monte[2]; J. -C. M'Peko[4]; A. C. Hernandes[4]; [1]Universidade de São Paulo; Universidade Federal de Uberlândia; [2]Universidade Federal de Uberlândia; [3]Universidad de La Habana; [4]Universidade de São Paulo

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

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

Tuesday AM
October 1, 2019
11:00 AM-12:00 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P1-102: Effect of Ca Addition on Grain Refinement of Fe-B-P-Cu Alloys: *Je hyuk Oh*[1]; Dae-Geun Nam[1]; [1]Korea Institute of Industrial Technology (KITECH)

P1-103: Gas Phase Sodium Flame Synthesis of Non-oxide Metallic Powders: Larry Wang[1]; Aamir Abid[1]; *Mary Krause*[1]; Geoffrey Smith[1]; Nick Yin[1]; Craig Sungail[1]; Gordon Smith[1]; [1]Global Advanced Metals

P1-104: Structural and Magnetic Properties of NiO@MnxNi1-xO Core-Shell Nanoparticles Synthesized at Varying pH Values: *Abdullah Shafe*[1]; Robert Mayanovic[1]; Richard Wirth[2]; [1]Missouri State University; [2]GFZ German Research Centre for Geosciences

P1-106: Electrochemical Performances of Biomass Carbons Derived from Cassava and Bamboo as Advanced Electrode Materials: Beatriz Vessalli[1]; *Shakir Bin Mujib*[2]; Waldir Bizzo[3]; Talita Mazon[1]; Gurpreet Singh[2]; [1]Centro de Tecnologia da Informação Renato Archer (CTI); [2]Kansas State University; [3]University of Campinas

P1-108: Carbon Rich SiOCN Fibers from Silazane/PAA Hybrid Polymer: *Zhongkan Ren*[1]; Christel Gervais[2]; Gurpreet Singh[1]; [1]Kansas State University; [2]Sorbonne Université, Collège de France

P1-109: Particle and Grain Size Relationships in Environmentally Controlled - Pressure Assisted Sintering: *Kevin Anderson*[1]; James Wollmershauser[1]; Edward Gorzkowski[1]; Boris Feigelson[1]; [1]U.S. Naval Research Laboratory

P1-110: Understanding Crystallization Behavior within Microfluidic Droplets: *Shohom Bose-Bandyopadhyay*[1]; Kiryakos Mutafopulos[2]; Ashley Vu[3]; David Weitz[2]; Susmita Bose[3]; [1]Pullman High School; [2]Harvard University; [3]Washington State University

P1-111: Study on the Safety and Longevity of Nanometer Insulation Materials: *Yu Yanwen*[1]; [1]Baoshan Iron Steel Co.Ltd

Glasses, Optical Materials, and Devices: Current Issues in Science & Technology — Poster Ssession

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

Tuesday AM
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Room: Exhibit Hall CD
Location: Oregon Convention Center

P1-21: Characterization of Potentially Antibacterial Glass Powders Prepared by Zn2+ Ion Exchange: Duygu Güldiren[1]; Ipek Erdem[2]; Caner Kuzu[2]; *Suheyla Aydin*[2]; [1]Sisecam Science, Technology and Design Center; [2]Istanbul Technical University

P1-22: Effect of Al_2O_3:K_2O Ratio on Sintering and Crystallization Behaviour of Lithium Dislicate Glass Ceramics: *Santa Kolay*[1]; Parag Bhargava[1]; [1]IIT Bombay

Global Young Investigators Forum — Poster Session

Program Organizers: Kathleen Shugart Cissel, UES Inc; Victoria Christensen, University of California Santa Barbara

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Location: Oregon Convention Center

P1-125: Infiltration Studies to Assess the Stability and Performance of $BaCo_{0.4}Fe_{0.4}Zr_{0.1}Y_{0.1}O_{3-\delta}$ Cathode: *Jack Duffy*[1]; Yuqing Meng[2]; Shiwoo Lee[3]; Harry Abernathy[3]; Gregory Hackett[4]; Kyle Brinkman[1]; [1]National Energy Technology Laboratory, Clemson University; [2]Clemson University; [3]National Energy Technology Laboratory, Leidos Research Support Team; [4]National Energy Technology Laboratory

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

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

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P1-72: A Study on Finite Deformation of Copper Crystals Using the Principles of Crystal Plasticity: Experiments and Simulations: *Suman Paik*[1]; Bijan K Dutta[2]; Durgaprasad P V[1]; [1]Bhabha Atomic Research Centre; [2]Homi Bhabha National Institute

P1-73: Atomic Simulation of Dynamic Recrystallization Initiated by Direct Grain Reorientation at High-angle Grain Boundary in Alpha-titanium: *Hao Wang*[1]; [1]Institute of Metal Research

P1-74: Crystal Plasticity Finite Element Analysis of Commercially Pure Titanium: *Ji Hoon Kim*[1]; Hye In Jung[1]; Joo-Hee Kang[2]; Chang-seok Oh[2]; [1]Pusan National University; [2]Korea Institute of Materials Science

P1-75: Diffuse-interface Approach to Modeling Plasticity, Interfacial Sliding and Coherency Loss: *Tianle Cheng*[1]; Youhai Wen[1]; Jeffrey Hawk[1]; [1]US DOE, National Energy Technology Laboratory

P1-76: Evaluation of Van Der Waals Interactions in Uranium Phases using Density-functional Theory (DFT) using the Exchange-hole Dipole Moment (XDM) Dispersion Correction: *Matthew Christian*[1]; Erin Johnson[2]; Theodore Besmann[2]; [1]University of South Carolina; [2]Dalhousie University

P1-77: Interface Formation during FCO to BCC Phase Transformation: Yipeng Gao[1]; *Yongfeng Zhang*[1]; Benjamin Beeler[1]; Bei Ye[2]; [1]Idaho National Laboratory; [2]Argonne National Laboratory

P1-78: Linking Microscale Experiments and Modeling to Predict Macroscale Mechanical Properties in Iron: *Allyssa Bateman*[1]; Geeta Monpara[2]; Ray Fertig[2]; Yaqiao Wu[1]; Brian Jaques[1]; [1]Boise State University; [2]University of Wyoming

P1-79: Microstructural Evolution Simulation for Property Prediction in Solid State Additive Manufacturing: *Danielle Cote*[1]; Chris Massar[1]; Bryer Sousa[1]; Kyle Tsaknopoulos[1]; Victor Champagne[2]; [1]Worcester Polytechnic Institute; [2]U.S. Army Research Laboratory

P1-80: Modeling Temperature-dependent Yield Stress of FCC High-entropy Alloys with Experimental Validation: *Zongrui Pei*[1]; Martin Detrois[1]; Paul Jablonski[1]; Jeffrey Hawk[1]; Ömer Dogan[1]; David Alman[1]; Michael Gao[1]; [1]National Energy Technology Laboratory

P1-84: Phase Field Modeling of the Influence of Thermo-mechanical Conditions on Phase Transformation in Titanium Alloys: *Arun Baskaran*[1]; Daniel Lewis[1]; [1]Rensselaer Polytechnic Institute

PI-86: Particle Effect on the Behavior and Spreading Kinetics of a Nano-suspension Drop: MD Simulations: *Baiou Shi*[1]; Weizhou Zhou[2]; Edmund Webb[2]; [1]Penn State Erie; [2]Lehigh University

International Symposium on Ceramic Matrix Composites — Poster Session

Program Organizers: Narottam Bansal, National Aeronautics and Space Administration; Jacques Lamon, LMT-Cachan, CNRS; Sung Choi, Naval Air Systems Command; J. P. Singh, US Army Research Laboratory (Retired)

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Room: Exhibit Hall CD
Location: Oregon Convention Center

Session Chair: Narottam Bansal, NASA Glenn Research Center

P1-24: Relating Damage Progression in SiC/SiC CMCs to Microstructural Features using X-ray Tomography Techniques: *Ashley Hilmas*[1]; Kathleen Sevener[1]; [1]University of Michigan

P1-25: Corrosion and Erosion Studies of Ceramic Matrix Composites: *Spencer Swartzbaugh*[1]; Josh Diaz[1]; John Kasraei[1]; Vilupanur Ravi[1]; [1]Cal Poly Pomona

P1-26: Computational Analysis of Spark Plasma Sintering: Heat Transfer and Temperature Distribution: *Rodolfo Fernandez*[1]; [1]Florida International University

Modeling Variability of Mechanical Behavior through ICME Techniques with Emphasis on Verification, Validation & Uncertainty Quantification — Poster Session

Program Organizers: Jacob Hochhalter, University of Utah; Michael Sangid, Purdue University; Corbett Battaile, Sandia National Laboratories; Barron Bichon, Southwest Research Institutue

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Room: Exhibit Hall CD
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P1-87: Coupled Thermo-metallo-mechanical Analyses of Heat Treatment of Low Alloy Steel Crank Throws: *Mengnie Li*[1]; Hengyong Bu[1]; [1]Kunming University of Science and Technology

Multi-scale Modeling of Microstructure Deformation in Material Processing — Poster Session

Program Organizers: Lukasz Madej, AGH University of Science and Technology; Jaimie Tiley, Air Force Office of Scientific Research (AFOSR/RTA); Krzysztof Muszka, AGH University of Science and Technology; Danuta Szeliga, AGH University of Science and Technology

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P1-88: Application of Embedded-Atom-Method for Characterizing the Atomic Deformation Behavior under Tensile Loading of a Simple Aluminum and Magnesium Cubic System: *Md Salah Uddin*[1]; Brahmananda Pramanik[1]; [1]Montana Technological University

P1-89 Dislocation Density-based Modeling of Deformation Behavior of Magnesium Alloy: *Krzysztof Muszka*[1]; Danuta Szeliga[1]; Paulina Lisiecka-Graca[1]; Maciej Pietrzyk[1]; Dariusz Kuc[2]; [1]AGH University of Science and Technology; [2]Silesian University of Technology

P1-90: Evaluation of Local Hardening Behavior of Titanium Alloys based on Nanoindentation and Inverse Analysis: *Lukasz Madej*[1]; Mateusz Mojzeszko[1]; Mohan Setty[2]; Krzysztof Muszka[1]; [1]AGH University of Science and Technology; [2]Deakin University, Institute for Frontier Materials

P1-91: Modeling of Processes for the Production of Bassed Alloys TiAl and NiAl in the Conditions of SHS for Aerospace Applications: *Borys Sereda*[1]; Yuriy Belokon[1]; Dmytro Sereda[1]; Irina Kruglyak[1]; [1]Dneprovsky State Technical University

Next Generation Biomaterials — Poster Session

Program Organizers: Roger Narayan, University of North Carolina; Federico Rosei, INRS Centre for Energy, Materials and Telecommunications

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Room: Exhibit Hall CD
Location: Oregon Convention Center

Session Chair: Roger Narayan, North Carolina State University

P1-3: Development of Biocompatible Ceramic Powders Designed for Additive Manufacturing: A Preliminary Study: *Christos Softas*[1]; Sooraj Nandyala[1]; Ifty Ahmed[2]; Artemis Stamboulis[1]; [1]University of Birmingham; [2]University of Nottingham

P1-4: Effect of Biofunctionalization of Gingerol / ZnO / Polydopamine Composite on Biological Properties of CaP Coated Ti Implants: *Arjak Bhattacharjee*[1]; Susmita Bose[1]; [1]Washington State University

P1-5: Effects of Cissus Quadrangularis and Polydopamine Coated 3D Printed Scaffolds on Dynamic and Static Bone Cell Cultures: *Sam Robertson*[1]; Susmita Bose[1]; [1]Washington State Univ

P1-6: Ginger and Garlic Extract Enhance Bone Tissue Formation in Rat Distal Femur Model Using 3D Printed Tricalcium Phosphate Scaffolds: Susmita Bose[1]; *Ashley Vu*[2]; Dishary Banerjee[1]; [1]Washington State University; [2]University of Birmingham

P1-7: Liposome-encapsulated Curcumin Loaded 3D Printed Scaffold for Bone Tissue Engineering: *Naboneeta Sarkar*[1]; Susmita Bose[1]; [1]Washington State University

P1-8: Microstructure and Mechanical Properties of Cold-Rolled ß Metastable Titanium Ti-24Nb-4Mo-xZr Alloys for Orthopedic Applications: *Aline Raquel Nunes*[1]; Maycon Junior Moraes de Pinho[2]; Caio Marcello Cossú[3]; Sinara Borborema[2]; Jean Dille[1]; Luiz Henrique de Almeida[1]; [1]COPPE/UFRJ/Brazil; [2]FAT/UERJ; [3]EEL/USP

P1-9: The Diffusion of Oxygen and Glucose into Artificial Pancreas: Modeling of Reaction-diffusion Transport into a Core-shell Geometry: *Clarence King*[1]; Scott Beckman[1]; [1]Washington State University

P1-126: Numerical and Experimental Investigation on the Mechanical Behaviour of 3D Printed Multi-component Ceramics: *Rezvan Gharehbaghi*[1]; Stuart Blackburn[2]; David Grossin[3]; Artemis Stamboulis[1]; [1]School of Metallurgy and Materials, University of Birmingham; [2]School of Chemical Engineering, University of Birmingham; [3]CIRIMAT Université de Toulouse, CNRS, INPT, UPS, ENSIACET

P1-127: Ultrahigh Strength Rare Earth Free Resorbable Mg Alloys Produced via Non-equilibrium Methods: *Ehsan Mostaed*[1]; Malgorzata Sikora-Jasinska[1]; Jaroslaw W. Drelich[1]; [1]Michigan Technological University

P1-131: Effect of Cationic and Anionic Co-doping on Mechanical and Biological Properties of Hydroxyapatite-coated Titanium: *Arjak Bhattacharjee*[1]; Sam Robertson[1]; Amit Bandyopadhyay[1]; Susmita Bose[1]; [1]Washington State University

Semiconductor Heterostructures: Theory, Growth, Characterization, and Device Applications — Poster Session

Program Organizers: John Ayers, University of Connecticut; Phil Ahrenkiel, South Dakota School of Mines and Technology; Ganesh Balakrishnan, University of New Mexico

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Session Chairs: Phil Ahrenkiel, South Dakota School of Mines and Technology; Ganesh Balakrishnan, University of New Mexico; John Ayers, University of Connecticut

P1-61: A Modeling Study of Dislocation Filtering using InGaAs/GaAs (001) Strained-Layer Superlattices: *Md Islam*[1]; Tedi Kujofsa[1]; John Ayers[1]; [1]University of Connecticut

P1-62: Comparison of a DTKA Plastic Flow Model for InGaAs/GaAs (001) Heterostructures to Experimental Results: *Kevin Lindstrom*[1]; James Wales[1]; Tedi Kujofsa[1]; John Ayers[1]; [1]University of Connecticut

P1-63: Model for Dislocation Pinning in InGaAs/GaAs (001) Heterostructures: *Tedi Kujofsa*[1]; John Ayers[1]; [1]University of Connecticut

P1-64: X-ray Diffraction Analysis of InGaAs/GaAs Multi Quantum Wells Grown on a GaAs (001) Substrate: *Fahad Althowibi*[1]; [1]Taif Univesity

Surface Properties of Biomaterials — Poster Session

Program Organizers: Ryan Bock, SINTX Technologies; Jason Langhorn, DePuy Synthes Joint Reconstruction; Susmita Bose, Washington State University; Amit Bandyopadhyay, Washington State University; Mangal Roy, Indian Institute of Technology-Kharagpur; Venu Varanasi, University of Texas at Arlington

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Location: Oregon Convention Center

P1-10: 3D Printing of Bioglass-TCP Scaffolds: Biological and Mechanical Property Evaluation: *Arjak Bhattacharjee*[1]; Dishary Banerjee[1]; Aldo Boccaccini[2]; Amit Bandyopadhyay[1]; Susmita Bose[1]; [1]Washington State University; [2]University of Erlangen-Nuremberg

P1-11: Bio-tribocorrosion of Metals and Alloys: *Jose Avila*[1]; Amit Bandyopadhyay[1]; Susmita Bose[1]; [1]Washington State University

P1-12: Designing Alloys Using Additive Manufacturing for Orthopedic Applications: *Indranath Mitra*[1]; Susmita Bose[1]; Amit Bandyopadhyay[1]; [1]Washington State University

P1-13: Effects of Crocin and Bicarbonate as Anti-inflammatory Agents and Osteogenic Factors for In Vivo Bone Formation: *Sam Robertson*[1]; Caitlin Koski[1]; Susmita Bose[1]; [1]Washington State University

P1-14: Effects of Garlic Extract Released from Calcium Phosphate Scaffolds for Bone Tissue Engineering Applications: *Ashley Vu*[1]; Susmita Bose[1]; [1]Washington State University

P1-15: Evaluation of Bioactivity and Mechanical Properties of Silica-based Ceramic for Using in Tissue Engineering Application: *Fariborz Tavangarian*[1]; Sorour Sadeghzade[2]; Rahmatollah Emadi[2]; [1]Pennsylvania State University, Harrisburg; [2]Isfahan University of Technology

P1-16: Evaluation of Mechanical Properties, Biodegradability and Bioactivity of Forsterite-Diopside Scaffolds Coated by Polycaprolacton Fumarate: *Sorour Sadeghzade*[1]; Rahmatollah Emadi[1]; Fariborz Tavangarian[2]; [1]Isfahan University of Technology; [2]Pennsylvania State University, Harrisburg

P1-17: Novel Dual-drug Delivery System from HA Coated Ti Implant for Enhanced In Vitro Osteogenesis and Chemoprevention: *Naboneeta Sarkar*[1]; Susmita Bose[1]; [1]Washington State University

Late News Poster Session — Biomaterials

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Room: Exhibit Hall CD
Location: Oregon Convention Center

P1-18: Bond Strength of Denture Teeth to Heat-cured, CAD-CAM and 3D Printed Denture Acrylics: *Joanne Choi*[1]; Caira Ellyse Uy[1]; Polina Plaksina[1]; Rishi Ramani[1]; Ritu Ganjigatti[1]; Neil Waddell[1]; [1]University of Otago

P1-19: Enhancing Hydrophilicity of Prosthetic Eyes: *Karnika De Silva*[1]; Keith Pine[2]; [1]University of Auckland, New Zealand; [2]The New Zealand Prosthetic Eye Service

P1-20: Superior Mechanical and Anti-corrosion Properties of Biocompatible Coatings on Ti Alloy: *Yan Bao*[1]; [1]City University of Hong Kong

Late News Poster Session — Ceramic and Glass Materials

Tuesday AM
October 1, 2019
11:00 AM-12:00 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P1-27: Drilling Study of Multi-directional Carbon Fiber Reinforced Polymers: *Kamlesh Phapale*[1]; [1]Bharat Forge Ltd

P1-28: Enhanced Optical Nonlinearity in Rare-earth Element and Gold Nanoparticles Co-doped Bismuth Borosilicate Glass: *Shivani Singla*[1]; Om Pandey[1]; Gopi Sharma[2]; [1]Thapar Institute of Engineering & Technology; [2]Kanya Maha Vidyalaya

P1-30: On the Decomposition of Cerium Aluminate into Aluminum Oxide and Cerium Oxide: *Aaron Johnston-Peck*[1]; Russell Maier[1]; [1]National Institute of Standards and Technology

P1-31: Oxidation Kinetics of C/C Ceramic Matrix Composites Using Thermogravimetric Analysis: *Muhammad Imam*[1]; Vinay Damodaran[1]; Pavana Prabhakar[1]; [1]University of Wisconsin-Madison

P1-32; Plasma Arc Jet Oxidation of Vacuum Plasma Sprayed Hafnium Nitride: *Archana Loganathan*[1]; Cheng Zhang[1]; Luiza Fontoura[1]; Benjamin Boesl[1]; Arvind Agarwal[1]; [1]Florida International University

P1-33: Pressure Induced Tuning of Lattice Distortion: Amorphization and Band Gap Engineering in a High-entropy Oxide: *Qiaoshi Zeng*[1]; [1]Hpstar

P1-34: Sintering Additives NiO and CuO: Solid Solubility in $BaZr_{0.85}Y_{0.15}O_{3-d}$ Estimated from Magnetometry: *Michael Knight*[1]; Ivar Reimanis[1]; [1]Colorado School of Mines

P1-35: Structure Evolution of Novel SiBZrOC Ceramics Derived by Sol-gel Method: *Chen Liu*[1]; [1]Harbin Insititute of technology

P1-37: Synthesis and Characterization of Ceramic Syntactic Foams for Use as Catalysts and Catalyst Support: *Micah Armstrong*[1]; Sarah Nealy[1]; Courtney Severino[1]; Waldemar Maniukiewicz[2]; Magdalena Modelska[2]; Michal Binczarski[2]; Izabela Witonska[2]; Krishan Chawla[1]; Andrei Stanishevsky[1]; [1]University of Alabama at Birmingham; [2]Lódz University of Technology

P1-38: The Roles of Interface Compatibility, Grain Constraint, and Volume Change on the Martensitic Transformation in ZrO_2-based Shape-memory Ceramics: *Edward Pang*[1]; Christopher Schuh[1]; [1]Massachusetts Institute of Technology

P1-128 Finite Element Analysis of Heat Transfer through the Laser Scan on Alumina (Al_2O_3) during Additive Manufacturing Process: *Mohammad Ali Ausaf Qureshi*[1]; William David Griffiths[1]; Artemis Stamboulis[1]; [1]University of Birmingham

Late News Poster Session — Electronic and Magnetic Materials

Tuesday AM
October 1, 2019
11:00 AM-12:00 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P1-65: Exploration of Thin Films as a Potential Material for Ceramic Low-dielectric Applications: *Eric Ngo*[1]; Mat Ivill[1]; Samuel Hirsh[1]; Daniel Shreiber[1]; Clifford Hubbard[1]; Govind Mallick[1]; John Carroll[1]; [1]U.S. Army Research Laboratory

P1-66: Fabrication of Stress Free Ni-Co Coatings Using Electroplating Method: Yong-Su Lee[1]; *Jaeho Lee*[1]; [1]Hongik University

P1-67: Microstructural Comparison of Deformation Processing Effects on Aluminum/Calcium Metal-metal Composite Conductor Wires: *Dustin Hickman*[1]; Charles Czahor[1]; Trevor Riedemann[2]; Iver Anderson[1]; [1]Iowa State University; [2]Ames Laboratory

P1-68: Semiconducting Single-wall Carbon Nanotube/BiFeO3 Heterostructure for Enhanced Photovoltaic Effect by Wide-range Light Absorption and Efficient Charge Separation: *Taekjib Choi*[1]; [1]Sejong University

Late News Poster Session — Failure Analysis

Tuesday AM
October 1, 2019
11:00 AM-12:00 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P1-69: Cracking in Forged 1½" dia SA 182 F304L Integrally Reinforced Nozzles from a Fourth Stage CO_2 Compressor Suction Separator: *Riza Khan*[1]; [1]In-Corr-Tech Ltd

P1-70: Fatigue Cracking of Several Passenger Bus Steel Frame Crossbars: Hector Castelblanco[1]; *Gabriel Castro Güiza*[1]; [1]Universidad Central

P1-71: Microstructural Evaluation of an Overheated Gas Turbine Blade: Xiaotong Guo[1]; Weiwei Zheng[1]; Longfei Li[1]; Stoichko Antonov[1]; Yunrong Zheng[1]; *Qiang Feng*[1]; [1]University of Science and Technology Beijing

Late News Poster Session — Modeling

Tuesday AM
October 1, 2019
11:00 AM-12:00 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P1-92: Crystal Structure Prediction through Density Functional Theory Combined with Unsupervised Machine Learning: A Vitamin B2 Case Study: *Thiago Henrique da Silva*[1]; Matthew King[1]; [1]Boise State University

P1-93: Development of EAM Interatomic Potentials of Aluminides and Carbides for Ni-based Superalloys: *Muztoba Rabbani*[1]; Sabila Kader Pinky[1]; Nirmal Baishnab[1]; Tyler McGilvry James[1]; Ridwan Sakidja[1]; [1]Missouri State University

P1-94: Effect of Virtual Spherical Indenter Stiffness on Atomistic Simulations of Nanoindentation: *Zhenhai Xu*[1]; Debin Shan[1]; [1]Harbin Institute of Technology

P1-95: Modeling Ductile Failure of High Strength Aluminum Alloy: Balaji Selvarajou[1]; Mark Jhon[1]; *Siu Sin Quek*[1]; [1]Institute of High Performance Computing

P1-96: Modeling of Phase Transformation Kinetics in Post Heat-treated Resistance Spot Welds of AISI 1010 Mild Steel: *Blériot Vincent Feujofack Kemda*[1]; Noureddine Barka[1]; Mohammad Jahazi[2]; Denis Osmani[3]; [1]Université du Québec à Rimouski; [2]École de Technologie Supérieure; [3]AMH Canada Ltée

P1-97: Numerical Methods Applications in Crystal Plasticity Finite Element Method: *Theodore Zirkle*[1]; Bill Locke[2]; Ben Anglin[2]; Clint Geller[2]; David McDowell[1]; [1]Georgia Institute of Technology; [2]Bettis Laboratories

P1-98: Simulation and Optimization of Magnetically-assisted Welding of Stainless Steel 316L: *Kevin Carpenter*[1]; Ali Tabei[1]; Saereh Mirzababaei[1]; Somayeh Pasebani[1]; [1]Oregon State University

P1-100: Void Growth in Bicrystalline and Polycrystalline Ni-based Superalloy: Atomistic Calculation: *Sabila Kader Pinky*[1]; Ridwan Sakidja[1]; [1]Missouri State University

Late News Poster Session — Nanomaterials

Tuesday AM
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11:00 AM-12:00 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P1-112: Bioprocess-inspired Fabrication of Multi-layered TiO2/Polymer Composites with Enamel-like Structure and High Mechanical Properties: *Liwen Lei*[1]; Zhengyi Fu[1]; Jinjiang Wei[1]; [1]Wuhan University of Technology

P1-113: Catalytic Property of Vanadium-based Composite Material on NH3-SCR: *Bora Jeong*[1]; Jin-Sun Cha[2]; Duck Hyun Lee[1]; Hong-Dae Kim[1]; [1]Korea Institute of Industrial Technology/Green Materials & Processes Group; [2]Korea Testing Laboratory

P1-114: Controlling Nanostructures of Si-based Ceramics via Carbothermal Reduction of Mesoporous Silica-Carbon Nanocomposites: *Kun Wang*[1]; [1]Wuhan University of Technology

P1-115: Effect of Consolidation Conditions on the Densification of a Nanostructured Oxide-dispersion Strengthened FeNiZr Alloy via the Field Assisted Sintering Technology: *Sean Fudger*[1]; Thomas Luckenbaugh[2]; Chad Hornbuckle[1]; Efrain Hernández-Rivera[1]; A.J. Roberts[1]; Chris Haines[1]; Kris Darling[1]; [1]U.S. Army Research Laboratory; [2]Bowhead Total Enterprise Solutions LLC

P1-116: Electrochemical Evaluation of Titanium Oxide Tubular Structure: *Hassam Muazzam*[1]; [1]Industries, Commerence & Investment

P1-117: Energy Storable Carbon Fiber Composite Supercapacitors Based on Three-dimensional CNT/Graphene Hydrogel and Aramid Nanofiber-reinforced Epoxy Electrolyte: *Wonoh Lee*[1]; [1]Chonnam National University

P1-118: Evaluation of Mechanical Properties for Electroless Ni-P-PTFE-WO3 Composite Coatings: *Hyoung Chan Kim*[1]; Sang Joon Lee[1]; Hyoung-Seok Moon[1]; Byung Jun Kim[1]; Gwang Joo Jang[1]; [1]Korea Institute of Industrial Technology

P1-119: Homojunction of Oxygen and Titanium Vacancies and Its Interfacial n–p Effect: *Yitian Wang*[1]; Siming Wu[1]; Xiaoyu Yang[1]; [1]Wuhan University of Technology

P1-120: Low Temperature SCR Catalyst for NOx Abatement by Well-dispersed Nanoparticles Supported on Porous Hexagonal Boron Nitride: *Myeung-jin Lee*[1]; Do-Hyun Kim[2]; Taewook Kim[1]; Heesoo Lee[3]; Hong-Dae Kim[1]; [1]Korea Institute of Industrial Technology; [2]Korea University; [3]Pusan National University

P1-121: Microwave Synthesis of PbSe Quantum Dots and their Application for Detecting Ionizing Radiation: *Nova Wu*[1]; Tyler McCrea[1]; Haori Yang[1]; Gregory Herman[1]; Han Mei[1]; Chih-Hung Chang[1]; Stebby John[1]; [1]Oregon State University

P1-122: Mussel-directed Synthesis of Nanomaterials: *Jingjing Xie*[1]; [1]Wuhan University of Technology

P1-123: Ni Nano-wire and Nano-thin Films on Highly Ordered Pyrolytic Graphite (HOPG) by Atomic Layer Deposition (ALD): *Hyoung-Seok Moon*[1]; Hyoung Chan Kim[1]; Byung Jun Kim[1]; [1]KITECH/Energy Plant R&D Geoup

P1-124: Novel Solid Lubricants for Use in Multifarious Environments at High Load and Sliding Speeds: *Aditya Ayyagari*[1]; Kalyan Mutyala[1]; Anirudha Sumant[1]; [1]Argonne National Laboratory

11th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing — Poster Session

Program Organizers: Surojit Gupta, University of North Dakota; Yiquan Wu, Alfred University; Hisayuki Suematsu, Nagaoka University of Technololgy; John Wolodko, University of Alberta; Christopher Taylor, DNV GL; Junichi Tatami, Yokohama National University; Enrico Bernardo, University of Padova; Zhengyi Fu, Wuhan University of Technology; Rajiv Asthana, University of Wisconsin; 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

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Room: Exhibit Hall CD
Location: Oregon Convention Center

P2-23: A New Experimental Approach to Improve the Recovery of Low-grade Refractory Copper Oxide Ore:The Combination of Selective Flotation with High-gradient Magnetic Separation: Daixiong Chen[1]; *Jun Xiao*[1]; [1]Hunan Research Institute for Non-ferrous Metals

P2-25: Analysis of Energy and Mass Conservation in the Process of Hazardous Waste Melting: *Hui Sun*[1]; [1]Shenwu Technology Group Corp Co.,Ltd.

P2-26: Broadband Microwave Absorber Based on Bio-sourced Composite: *Ratiba Benzerga*[1]; Chloé Méjean[1]; Ala Sharaiha[1]; [1]University of Rennes, IETR

P2-27: Fabrication and Characterization of Inkjet-printed Cs2SnI6 Thin Film for Optoelectronic Application: *Shujie Li*[1]; Alex Kosekb[1]; Shi-Joon Sung[2]; Chih-hung Chang[1]; [1]Oregon State University; [2]DGIST

P2-28: Laser Welding Application for Secondary Cell Module for Electrical Vehicle: *Heeshin Kang*[1]; Jiwhan Noh[1]; Jiyeon Choi[1]; Sanghoon Ahn[1]; [1]Korea Institute of Machinery & Materials

P2-29: The Review on Advanced Synthesized Diamonds Consolidation: Sandra Veljkovic[1]; *Vojislav Mitic*[2]; Goran Lazovic[3]; Markus Mohr[4]; Vesna Paunovic[1]; Hans Fecht[5]; [1]University of Nis, Faculty of Electronic Engineering; [2]University Nis, Fac. Electronic Engineering, ITS. S.A.S.A.; [3]University of Belgrade, Faculty of Mechanical Engineering; [4]Institute of Micro and Nanomaterials, Ulm University; [5]Institute of Functional Nanosystems FNS, Ulm University

P2-30: Valorization of Zinc Slag by-product via Geopolymerization: Potential Use for Dry Cask Applications: *Raul Florez*[1]; Deiber Riasco B.[2]; Carlos Castano[1]; Henry Colorado[2]; [1]Missouri University of Science & Technology; [2]Universidad de Antioquia

P2-32: Development of Ultra-high Hydrophobic Coating on Hardwood Material: *Shahid Hussain Abro*[1]; [1]NED University of Engineering

P2-33: Performance of Concrete Incorporating with Marble Waste: *Gurpreet Singh*[1]; onkar Sidhu[1]; [1]Punjabi University Patiala

P2-34: Insulation System in Green Buildings with Earthen Pots to Reduce Carbon Emissions for Better Environment: *Amitoj Saini*[1]; Navjot Singh[1]; Arshdeep Kang[1]; Anupinder Kaur[1]; Harmanjeet Sohi[1]; [1]Punjabi University

P2-35: Total-corrosion Modelling of the Cymbopogon Citratus Leaf-extract Admixture Performance on Steel-reinforced Concrete for the Saline/Marine Service-environment: *Joshua Okeniyi*[1]; Esther Akinlabi[2]; Elizabeth Okeniyi[1]; [1]Covenant University; [2]University of Johannesburg

Actinide and Lanthanide Materials III — Poster Session

Program Organizers: Clarissa Yablinsky, Los Alamos National Laboratory; Ryan Stillwell, Lawrence Livermore National Laboratory; Kester Clarke, Colorado School of Mines; Clinique Brundidge, Naval Nuclear Laboratory; Adam Farrow, Los Alamos National Laboratory; Curt Lavender, Battelle - Pacific Northwest National Laboratory; Douglas Burkes, Pacific Northwest National Laboratory

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Room: Exhibit Hall CD
Location: Oregon Convention Center

Session Chair: Clarissa Yablinsky, Los Alamos National Laboratory

P2-1: A Young's Modulus Comparison Study in Aluminum, Uranium, and Plutonium: *Clarissa Yablinsky*[1]; Meghan Gibbs[1]; Taylor Jacobs[1]; Miranda Williams[1]; Carlos Archuleta[1]; Tomas Martinez[1]; Todd Martinez[1]; Cody Miller[1]; Daniel Coughlin[1]; Rodney McCabe[1]; Tarik Saleh[1]; [1]Los Alamos National Laboratory

P2-2: Characterization of Heat Source Containment Capsules: *Angelique Wall*[1]; David Wayne[1]; Joseph Romero[1]; Terry Holesinger[1]; [1]Los Alamos National Laboratory

P2-3: Fission Product Behavior in Irradiated U-Mo Alloys: *Dennis Keiser*[1]; Jan-Fong Jue[1]; Jian Gan[1]; Brandon Miller[1]; Adam Robinson[1]; Mukesh Bachhav[1]; [1]Idaho National Laboratory

P2-4: Removal of Impurity in Lanthanum Metal by Zone Refining: *Ke Xu*[1]; Siming Pang[1]; Shihong Yan[1]; Hongbo Yang[1]; Zhiqiang Wang[1]; Dehong Chen[1]; Daogao Wu[1]; Lei Zhang[1]; [1]Grirem Advanced Material Co.LM.

P2-5: The Effect of Argon Ion Sputtering on Uranium Hydride Initiation Time: *Wigbert Siekhaus*[1]; Art Nelson[1]; [1]Lawrence Livermore National Laboratory

Additive Manufacturing of Glass, Ceramics and Composites — Poster Session

Program Organizers: Tobias Schaedler, Hrl Laboratories Llc; Matthew Dickerson, Air Force Research Laboratory; Rebecca Dylla-Spears, Lawrence Livermore National Laboratory; Chang-Jun Bae, Korea Institute of Materials Science (KIMS)

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Room: Exhibit Hall CD
Location: Oregon Convention Center

Session Chairs: Chang-Jun Bae, Korea Institute of Materials Science (KIMS); Rebecca Dylla-Spears, Lawrence Livermore National Laboratory; Matthew Dickerson, Air Force Research Laboratory; Tobias Schaedler, HRL Laboratories, LLC

P3-1: Achieving the Upper Bound of Piezoelectric Constants of Additive Manufactured Nanocomposites: *Desheng Yao*[1]; Huachen Cui[1]; Ryan Hensleigh[1]; Xiaoyu Zheng[1]; [1]Virginia Tech

P3-2: Additive Manufacturing of Complex Micro-architected Graphene Aerogels: *Ryan Hensleigh*[1]; Huachen Cui[1]; James Oakdale[2]; Jianchao Ye[2]; Patrick Campbell[2]; Eric Duoss[2]; Christopher Spadaccini[2]; Xiaoyu Zheng[1]; Marcus Worsley[2]; [1]Virginia Tech; [2]Lawrence Livermore National Laboratory

P3-3: Additive Manufacturing Utilizing a Novel In-line Mixing System for Multi-scale Design of Ceramic Composites: *Joshua Pelz*[1]; Nicholas Ku[2]; Lionel Vargas Gonzalez[2]; Marc Meyers[1]; [1]University of California, San Diego; [2]US Army Research Laboratory

P3-4: Materials and Performance Studies of Light Sensitive Devices Obtained from Solution-based Inks: *Shah Mohammad Rahmot Ullah*[1]; Al-Amin Ahmed Simon[1]; Maria Mitkova[1]; [1]Boise State University

P3-5: Multiscale Mechanical Analysis of Lithiation Behavior of Silicon Oxide as High Capacity Anode Materials for Lithium Ion Batteries: *Janghyuk Moon*[1]; Min-Sik Park[2]; [1]Chung-Ang University; [2]Kyung Hee University

P3-6: Research on the Post-treatment Process of 3D Printing Resin Sand Shell: *Rui Guo*[1]; [1]Hubei University of Automotive Technology

P3-7: Study on Physicochemical Properties of Composite Refractories for Blast Furnace: *Fan Xiaoyue*[1]; Zhang Jianliang[1]; Jiao Kexin[1]; Zhao Yongan[2]; He Rusheng[3]; [1]University of Science and Technology, Beijing; [2]Henan Winna Industrial Group Co., Ltd.; [3] Beijing REALJD Group Co., Ltd.

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing: Poster Session I

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

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Location: Oregon Convention Center

P3-8: A Computational Model Based Investigation to Derive the Mechanism of Substructure Formation in Additively Manufactured (AM) 316L Stainless Steel: *Chamara Herath*[1]; Andrew Birnbaum[2]; John Michopoulos[2]; Amit Bagchi[2]; Ajit Achuthan[1]; [1]Clarkson University; [2]U.S. Naval Research Laboratory

P3-9: Additive Manufacturability of Various Nickel-aluminum Bronze Wire Using CMT-based Wire-arc Additive Manufacturing Process: *Jae-Deuk Kim*[1]; Joo Yong Cheon[1]; OkSu Kim[1]; Changwook Ji[1]; [1]Korea Institute of Industrial Technology

P3-10: Additive Manufacturing of Porous Copper Wicking Structures for Heat Pipes and Vapor Chambers: *Adnen Mezghani*[1]; Abdalla Nassar[2]; Corey Dickman[3]; Eduardo Valdes[4]; Raul Alvarado[4]; [1]Additive Manufacturing and Design Program, The Pennsylvania State University; [2]Applied Research Laboratory, The Pennsylvania State University ; [3]Applied Research Laboratory, The Pennsylvania State University; [4]SET Group

P3-11: Design of Additively Manufactured Methanol Conversion Reactor for High Throughput Production: *Dongsheng Li*[1]; Tom Maloney[2]; Nasir Mannan[2]; [1]Advanced Manufacturing LLC; [2]Connecticut Center of Advanced Technology

P3-12: Direct Writing Technology of Semi-solid Aluminium Alloys: *Xiaogang Hu*[1]; [1]Southern University of Science and Technology

P3-13: Effect of Ti Treatment on Inclusions, Microstructure and Properties of Shipbuilding Steel: *Xuewei Zhang*[1]; [1]Central Iron and Steel Research Institute

P3-16: Indentation Size Effect in Additively Manufactured 316L Stainless Steel: *Heonjune Ryou*[1]; Kathryn Wahl[2]; Edward Gorzkowski[2]; John Michopoulos[2]; Andrew Birnbaum[2]; [1]ASEE Postdoc cited at US Naval Research Laboratory; [2]US Naval Research Laboratory

P3-17: Intrinsic Heat Treatment in a Model Al-Sc Alloy during Laser Metal Deposition - Driving Factors, Kinetics and Effect of Alloying Elements: *Priyanshu Bajaj*[1]; Markus Wilms[2]; Ankit Gupta[1]; Philipp Kuernsteiner[1]; Tilmann Hickel[1]; Andreas Weisheit[2]; Eric Jaegle[1]; Dierk Raabe[1]; [1]Max-Planck-Institut für Eisenforschung GmbH; [2]Fraunhofer-Institut für Lasertechnik ILT

Additive Manufacturing of Metals: Microstructure, Properties and Alloy Development — Additive Manufacturing: Poster Session II

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

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Room: Exhibit Hall CD
Location: Oregon Convention Center

P3-18: Melt Pool Dynamics in Continuous Wave Laser Heating of Bulk and Powder Metal Targets: *Deepak Shah*[1]; Alexey Volkov[1]; [1]University of Alabama

P3-20: Off-line Quantification of in-build Cracking Susceptibility during AM Processing: *Shubhra Jain*[1]; Timothy Prost[2]; Ralph Napolitano[1]; [1]Iowa State University; [2]Ames Laboratory, DOE

P3-21: Optimizing Laser Parameters for Selectively Laser Melted Maraging Steel Using Deposited Energy Density: *Ryoya Nishida*[1]; Asuka Suzuki[1]; Naoki Takata[1]; Makoto Kobashi[1]; Masaki Kato[2]; [1]Nagoya University; [2]Aichi Center for Industry and Science Technology

P3-22: Single- and Double-Track Simulations of Melt Flow and Pore Formation in Powder-bed Fusion Additive Manufacturing using Smoothed Particle Hydrodynamics and Ray Tracing: *Deepak Shah*[1]; Alexey Volkov[1]; [1]University of Alabama

P3-23: The Role of Extraneous Oxygen in the Formation of Oxide Inclusions in Laser Powder Bed Fusion: *Pu Deng*[1]; Bart Prorok[1]; Xiaoyuan Lou[1]; Vijaya Rangari[2]; [1]Auburn University; [2]Tuskegee University

P3-114: Laser Powder Bed Fusion of Iron-based Bulk Metallic Glass Alloys: *Thinh Huynh*[1]; Holden Hyer[1]; Sharon Park[1]; Le Zhou[1]; Yongho Sohn[1]; [1]University of Central Florida

Additive Manufacturing of Metals: Post Processing — Poster Session

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

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P3-24: Comparative Study between the Processed and Unprocessed TIG Welded Joints: *Sipokazi Mabuwa*[1]; Velaphi Msomi[1]; [1]Cape Peninsula University of Technology

P3-25: Hot Isostatic Pressing of High Volume Fraction Gamma Prime Nickel-base Superalloys: *Brian Welk*[1]; Kevin Chaput[2]; Hamish Fraser[1]; [1]Ohio State University; [2]Air Force Research Laboratory

Additive Manufacturing: Effective Production, Characterization, and Recycling of Powder Materials — Poster Session

Program Organizers: James Paramore, U.S. Army Research Laboratory; Ulf Ackelid, Freemelt AB; Sudarsanam Babu, University of Tennessee, Knoxville; Brady Butler, U.S. Army Research Laboratory; Zhigang Fang, University of Utah; Ola Harrysson, North Carolina State University; Don Li, Arconic Titanium & Engineered Products; Andrzej Wojcieszynski, ATI Specialty Materials

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Location: Oregon Convention Center

P3-26: Identifying Correlations between Metal Powder Properties and Binder Jet Print Settings to Optimize Process: *Natalie Wieber*[1]; Amy Elliott[1]; [1]Oak Ridge National Laboratory

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

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

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P3-27: Characterizing In-situ Anisotropic Micromechanical Response in Additively Manufactured 17-4 Stainless Steel Using High-Energy X-ray Diffraction: *Darren Pagan*[1]; Thien Phan[2]; [1]Cornell High Energy Synchrotron Source; [2]National Institute of Standards and Technology

P3-28: In-situ Mechanical Neutron Diffraction Loading Characteristics of GRCop-84 Fabricated by Selective Laser Melting: *Robert Minneci*[1]; Claudia Rawn[1]; [1]University of Tennessee

P3-29: Influence of Sources of Heating and Protective Gases on the Properties of the Material Obtained by the Direct Deposition: *Mikhail Gnatenko*[1]; Valeriy Naumyk[2]; Maria Matkovska[2]; [1]JSC «Motor Sich»; [2]Zaporozhye National Technical University

Additive Manufacturing: Microstructure and Material Properties of Titanium-based Alloys — Poster Session

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

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Room: Exhibit Hall CD
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P3-30: Study on Additive Manufacturing based in GMAW Process for Ti-6Al-4V Alloy: *Tae Hyun Lee*[1]; Je Hoon Oh[2]; Dong-Hyuck Kam[1]; Cheolhee Kim[1]; [1]Korea Institute of Industrial Technology; [2]Hanyang University

Additive Manufacturing: Solid-state and Other Nonbeam-based Technologies for the Manufacturing of Metallic Parts — Poster Session

Program Organizers: Olaf Andersen, Fraunhofer Society; J. Brian Jordon, University of Alabama; Orlando Rios, Oak Ridge National Laboratory; Paul Allison, University of Alabama; Mark Norfolk, Fabrisonic LLC; Luke Brewer, University of Alabama

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P3-31: Corrosion Repair Using Additive Manufactured Stainless Steel 304L: *Brett Tucker*[1]; Paul Allison[1]; Luke Brewer[1]; [1]The University of Alabama

P3-33: Laser Assisted Cold Spray Deposition of Austenitic Stainless Steel: *Venkata Bhattiprolu*[1]; Luke Brewer[1]; [1]University of Alabama

P3-34: Significant Benefits of Solid State 3D Screen Printing for Manufacturing Micro-channel Heat Exchangers: *James Zess*[1]; [1]Zess Industries

P3-35: Wire Arc Additive Repair (WAAR) for the Restoration of Worn-out Helicopter Skids: *Hanadi Salem*[1]; Amr Moataz[1]; Sameha Sadek[1]; Mohamed Bakr[1]; [1]American University in Cairo

Advanced Coatings for Wear and Corrosion Protection — Poster Session

Program Organizers: Evelina Vogli, LM Group Holdings Inc.; Fei Tang, DNV GL; Arif Mubarok, PPG; Mary Lyn Lim, PPG Industries

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Room: Exhibit Hall CD
Location: Oregon Convention Center

Session Chair: Evelina Vogli, LM Group Holdings Inc.

P3-100: Calculation Model of Hydrogen Permeation in Copper Cooling Stave and Exploratory Research on Preparation of Hydrogen Permeation Barrier: *Fengguang Li*; [1]

P3-101: Research Status of Preparation of Surface Coating on Pure Copper: Yang Liu[1]; *Fengguang Li*; [1]Hubei University of Automotive Technology

P3-102: Role of Graphene Nanoplatelets on Splat Morphology and Microstructure of Plasma Sprayed Alumina Coatings: *Xiaolong Lu*[1]; Sadhana Bhusal[1]; Dong Zhao[2]; Cheng Zhang[1]; Yao Chen[2]; Arvind Agarwal[1]; [1]Florida International University; [2]Soochow University

P3-103: Surface Coatings Improve the Characteristics of Materials Obtained under SHS Conditions: *Borys Sereda*[1]; Dmytro Sereda[1]; Irina Sereda[1]; [1]Dneprovsky State Technical University

P3-104: Evaluation of Microstructure of Martensitic Stainless Steel CA6NM Welded by Pulsed Plasma Process: *Rodolpho Vaz*[1]; Anderson Pukasiewicz[2]; Ramón Paredes[3]; André Chicoski[1]; Luiz Procopiak[4]; Romildo Tristante[4]; [1]Lactec; [2]UTFPR; [3]UFPR; [4]Copel GeT

P3-105: Advanced Tribological Coatings Titanium Based Coatings Obtaining under SHS Conditions: *Borys Sereda*[1]; Dmytro Sereda[1]; Irina Palehova[1]; Alexander Gaydaenko[1]; [1]Dneprovsky State Technical University

P3-106: Mechanical and Corrosion Properties of Additive Manufactured Ti-Al-Cu-Si/Ti-6Al-4V Composite Coating: *Olawale Fatoba*[1]; Lester Naidoo[1]; Esther Akinlabi[1]; Stephen Akinlabi[1]; [1]University of Johannesburg

Advanced High Strength Steels / From Design to End Users — Poster Session

Program Organizers: Alla Sergueeva, NanoSteel Company Inc.; Daniel Branagan, The NanoSteel Company

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P3-82: Development of Copper Strengthened 0.2%C Low Alloyed Steel: *Pavel Podany*[1]; Jaromir Dlouhy[1]; Tomas Studecky[1]; [1]COMTES FHT

P3-83: Nucleation of Graphite Particles Formed in Medium Carbon Steel after Graphitising Anneal: *Aqil Inam*[1]; David Edmonds[2]; Rik Drummond-Brydson[2]; [1]University of the Punjab; [2]University of Leeds

P3-84: Optimizations of Submerged Entry Nozzle in a Steel Slab Continuous Casting Mold: *Yushi Tian*[1]; Shengtao Qiu[2]; Lijun Xu[2]; Rong Zhu[1]; [1]University of Science and Technology Beijing; [2]National Engineering Research Center of Continuous Casting Technology

Advanced Manufacturing, Processing, Characterization and Modeling of Functional Materials — Poster Session

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

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P2-36: Formulation and Characterization of Ceramic Ink for Digital Ink-jet Printing: *Kyu Sung Han*[1]; Jin Ho Kim[1]; Kwang Taek Hwang[1]; [1]Kicet

P2-37: Self-powered Hydrophone with Broadband Frequency and Rationally Designed Directivity Pattern via 3D Printing Using Piezoelectric Metamaterials: *Huachen Cui*[1]; Ryan Hensleigh[1]; Desheng Yao[1]; Xiaoyu Zheng[1]; [1]Virginia Polytechnic Institute

P2-38: The Solid Oxide Fuel Cell NiO Based and Microstructure Surface Fractal Characterization: *Vojislav Mitic*[1]; Goran Lazovic[2]; Ming Wei Liao[3]; Guang Hsun Tan[3]; Shabana Shaikh[4]; [1]University Nis, Fac. Electronic Engineering, ITS. S.A.S.A.; [2]Faculty of Mechanical Engineering University of Belgrade; [3]National Tsing Hua University; [4]Puna University

P2-39: Effects of Cooling Rate and Ti Addition on Microstructure, Mechanical Properties and Corrosion Characteristics of Laser Deposited Ti-6Al-4V Alloy: Olawale Fatoba[1]; *Esther Akinlabi*[1]; Stephen Akinlabi[1]; Omolayo Ikumapayi[1]; [1]University of Johannesburg

P2-40: Grain Boundary Character Distributions (GBCDs) of Annealed YIGs: *Minji Kim*[1]; Minsun Jang[1]; Youngkyun Son[1]; Kisuk Lee[1]; Sukbin Lee[1]; [1]Ulsan National Institute of Science and Technology

P2-43: Numerical Modelling of Additive Manufactured Ti-Al-Cu-Si/Ti-6Al-4V Composite by Direct Laser Metal Deposition (DLMD) Technique: Esther Akinlabi[1]; *Olawale Fatoba*[1]; Stephen Akinlabi[1]; Fredrick Mwema[1]; [1]University of Johannesburg

P2-44: Self-propagating High Temperature Synthesized Chevrel Phase Nanoparticles/Nanofibers via Electrospinning: *Milind Pawar*[1]; [1]Ohio State University

P2-45: Machine Learning for the 3D Printing of Polymer Composite Inks: *Isidro Pantoja G*[1]; Irmak Sargin[1]; Sepehr Nesaei[1]; Clarence King[1]; Arda Gozen[1]; Scott Beckman[1]; [1]Washington State University

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.

P2-46: Corrosion Behaviour of API 5L X42 and API 5L X60 Mild Steels in Different Combinations of Salt Solutions: *Wasiu Ajibola Ayoola*[1]; Muideen Bodude[1]; Stephen Durowaye[1]; Tajudeen Ayoola[1]; Ezekiel Anthony[1]; [1]University of Lagos

P2-47: Study on Structure and Properties of High Speed Steel Powder Coatings Sprayed on Surface of Steels for Cutlery 8Cr13MoV: Jihui Liu[1]; *Zhijun He*[1]; Taixu Xu[1]; Xiao Han[1]; Huan Zhang[1]; [1]University of Science and Technology Liaoning

P2-48: Effect of Heat Input on Nano-tribological and Corrosion Properties of Fe-based Amorphous/ Nanocrystalline Coating: *Anil Kumar*[1]; Sapan Nayak[1]; Atanu Banerjee[2]; Tapas Laha[1]; [1]Indian Institute of Technology, Kharagpur; [2]Research and Development Division, Tata Steel

P2-49: Mechanical and Electrochemical Behavior of an Economical Fe-based Amorphous / Nanocrystalline Composite Coating Synthesized by High Velocity Oxy-fuel Thermal Spraying: *Sapan K. Nayak*[1]; Anil Kumar[1]; Atanu Banerjee[2]; Tapas Laha[1]; [1]Indian Institute of Technology Kharagpur; [2]Research and Development Division, Tata Steel

P2-50: Electrochemical Characterization of Plasma-treated Titanium Alloys: *Kevin Robles*[1]; Sara Margala[2]; Nina Abramzon[1]; Vilupanur Ravi[2]; [1]California State Polytechnic University, Pomona; [2]Cal Poly Pomona

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

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

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P3-85: The Effect of Zn-Mg Interlayer on the Microstructure and Corrosion Resistance of PVD-processed Coatings: *KyoungPil Ko*[1]; Dong Yoeul Lee[1]; Kyung Hoon Nam[1]; Young Jin Kwak[1]; Yonghwa Jung[1]; Seok Jun Hong[1]; Woo Sung Jung[1]; Mun Jong Eom[1]; Sang Hyeon Lee[1]; [1]Posco Technical Research Laboratories

P3-86: Effect of the Microstructure Development on Cracking Phenomena in Hot-Dip Zn-Al-Mg Alloy Coatings on IF Steel: *In Gyeong Kim*[1]; Yong Bum Park[1]; [1]Sunchon National University

P3-87: Obtaining Zinc Coatings on a Sheet Steel in SHS Conditions: *Borys Sereda*[1]; Dmytro Sereda; Aleksandr Korobochka[1]; Irina Krugljak[1]; [1]Dneprovsky State Technical University

P3-88: Control of Zinc Coatings Obtained under SHS Conditions: Borys Sereda[1]; *Dmytro Sereda*[1]; Aleksandr Korobochka[1]; Irina Krugljak[1]; [1]Dneprovsky State Technical University

P3-89: Study on the Environment-friendly Coating Technology for Hot-dip Galvanized Steel Sheet with High Humidity Resistant: *Xueqiang Dong*[1]; Yilin Zhou[2]; Yu Song[3]; Taixiong Guo[3]; [1]PanGang Group Research Institute Co.,Ltd.; [2]Pangang Group Panzhihua Steel & Vanadium Co. Ltd.; [3]PanGang Group Research Institute Co.,Ltd.

Characterization of Materials and Properties through Metallography, Mechanical Testing and Analysis - From Fundamentals to the Cutting Edge — Poster Session

Program Organizer: Michael Keeble, Buehler

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P2-6: Development of a Technique to Evaluate the Bond Strengths of Cold Sprayed Single Particle Impacts: *Matthew Gleason*[1]; [1]Worcester Polytechnic Institute

P2-7: Metallographic Study of Chronic Surface Defects in Automotive Grade Cold-rolled Steel Sheet: *Soumendu Monia*[1]; Hrishikesh Jugade[1]; Goutam Mukhopadhyay[1]; [1]Tata Steel

Corrosion of Additively Manufactured Metals — Poster Session

Program Organizers: Eric Schindelholz; Rajeev Gupta, The University of Akron; Ajit Mishra, Haynes International; Amit Pandey, Ansys/Granta Design

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Session Chair: Eric Schindelholz, Sandia National Laboratories

P3-37: Microstructure and Corrosion Behavior of Alloy 625 Produced by Laser Powder Bed Fusion: *Christopher Faraj*[1]; Samad Firdosy[2]; Vilupanur Ravi[1]; [1]California State Polytechnic University, Pomona; [2]Jet Propulsion Laboratory, California Institute of Technology

Data Science for Material Property Interpretation — Poster Session

Program Organizers: Alex Belianinov, Oak Ridge National Laboratory; Ichiro Takeuchi, University of Maryland; Jeff Simmons, Wright Patterson Air Force Research Laboratory; Jason Hattrick-Simpers, National Institute of Standards and Technology

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P2-8: Evaluation for the Quality of Flake Graphite Cast Iron and Spheroidal Graphite Cast Iron by Tapping Test with Using Artificial Intelligence: *Mitsuki Shinohara*[1]; Nozomu Uchida[1]; Yuki Iwami[2]; Yuichi Hiramoto[2]; Masaya Kato[2]; Toshitake Kanno[2]; [1]Nagaoka University of Technology; [2]Kimura Foundry Co., Ltd.

Formability and Fracture of Metal Sheets — Poster Session

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

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

P3-90: Prediction Method of Voids Distribution in the Punched Surface of the Spheroidizing Annealed Medium Carbon Steel Sheet by the Scrap: *Ken Saito*[1]; Chikara Inoue[1]; Kazuhiko Yamazaki[2]; Sota Goto[2]; Shinsuke Suzuki[1]; [1]Waseda University; [2]JFE Steel Corporation

Gas/Metal Reactions, Diffusion, and Phase Transformation during Heat Treatment of Steel — Poster Session

Program Organizer: Daniel Baker, General Motors

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P3-91: Austenite Grain Evolution Mechanism of High Carbon Rail Based on Thermal Technology: *Jun Yuan*[1]; [1]Pangang Group Research Institute Co.,Ltd.

P3-92: Homogenization on Manganese Microsegregation in Continuous Cast Microalloyed Steel Slabs: *Rishav Raj*[1]; J.B. Wiskel[1]; D. Ivey[1]; L. Li[1]; H. Henein[1]; [1]University of Alberta

P3-93: Numerical Simulation Research on Quality Control of the Continuous Casting Billet at Different Casting Speeds: *Haitao Ma*[1]; Jiongming Zhang[1]; Rong Cheng[1]; Zhaozhao Yan[1]; [1]University of Science and Technology Beijing

Grain Boundaries, Interfaces, and Surfaces in Functional Materials: Fundamental Structure-Property-Performance Relationships — Poster Session

Program Organizers: Ming Tang, Rice University; Shen Dillon, University of Illinois, Urbana-Champaign; John Blendell, Purdue University; Wayne Kaplan, Technion - Israel Institute of Technology

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P2-9: A Green Two-step Route to Prepare Superhydrophobic-oleophobic Semitransparent Coatings: *Ying Zhang*

Hybrid Organic-Inorganic Materials for Alternative Energy — Poster Session

Program Organizers: Andrei Jitianu, Lehman College, City University of New York; Lisa Klein, Rutgers University; Lia Stanciu, Purdue University; Mihaela Jitianu, William Paterson University

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P3-59: Liquid Phase Synthesized $BaTiO_3$-$CoFe_2O_4$ Multiferroics Nanocomposites: *Irna Shahbudin*[1]; Go Kawamura[1]; Wai Tan[1]; Hiroyuki Muto[1]; Atsunori Matsuda[1]; [1]Toyohashi University of Technology

P3-60: Low-temperature Synthesis and Ionic Conductivity Studies of Ceria-carbonate Nanocomposite Electrolytes for Low Temperature SOFCs: Ana Lucia Villa[1]; José Alonso Guillen[1]; Antonio Fuentes[2]; *Padmasree Padmadas*[2]; [1]Instituto Tecnológico de Saltillo; [2]Cinvestav Saltillo

P3-61: NIR Annealing Treatment for Perovskite Films to Improve Solar Cells Performance: *Bosky Sharma*[1]; Dinesh Kabra[1]; Parag Bhargava[1]; [1]IIT Bombay

Joining of Advanced and Specialty Materials XXI — Poster Session

Program Organizers: Mathieu Brochu, McGill University; Anming Hu, University of Tennessee; Hiroaki Mori, Osaka University; Yuri Hovanski, Brigham Young University; Darren Barborak, WeldQC Inc; Akio Hirose, Osaka University; Peng He, Harbin Institute of Technology; Zhiyong Gu, University of Massachusetts Lowell; Zhenzhen Yu, Colorado School of Mines

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P2-51: Additive Manufacturing of Bimetallic Structure using Laser Engineered Net Shaping (LENS™): *Yanning Zhang*[1]; Bonny Onuike[1]; Amit Bandyopadhyay[1]; [1]Washington State University

P2-52: Microstructure and Mechanical/Electrochemical Behavior of Friction Stir Butt Welded Joint of Dissimilar Aluminium and Steel Alloys: *Sam Yaw Anaman*[1]; Hoon-Hwe Cho[1]; Hrishikesh Das[2]; Sung-Tae Hong[2]; [1]Hanbat National University; [2]University of Ulsan

P2-53: Interfacial Microstructure of Ti - STS Dissimilar Joints Brazed with Zr-Ti-Cu-Ni Metallic Glass Filler and Intermediate Layers: Jin Soo Park[1]; *Jin Kyu Lee*[1]; [1]Kongju National University

P2-54: Microstructure and Mechanical Properties of Friction-stir-welded Beryllium-copper Alloy Joints: *Kwangjin Lee*[1]; [1]Korea Institute of Industrial Technology

P2-55: Numerical Simulation of Temperature Distribution and Material Flow during Friction Stir Welding of Magnesium Alloy: *Evgenii Rylkov*[1]; Anton Naumov[1]; Fedor Isupov[1]; Oleg Panchenko[1]; [1]Peter The Great St.Petersburg Polytechnic Uni

Light Metal Technology — Poster Session

Program Organizers: Xiaoming Wang, Purdue University; Alan Luo, Ohio State University; Kumar Sadayappan, Canmet MATERIALS

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P2-57: Effect of Solidification Range on Hot Tearing Susceptibility of Al-Mg Alloys: *Young-Ok Yoon*[1]; Seong-Ho Ha[1]; Bong-Hwan Kim[1]; Hyun-Kyu Lim[1]; Shae K. Kim[1]; [1]Korea Institute of Industrial Tech

P2-58: Fabrication of Ultrafine Grained Aluminum Sheets by Repeated Roll-Bonding Process: *ChaYong Lim*[1]; Seunghee LEE[2]; [1]Korea Institute of Materials Science; [2]Mokpo National University

P2-59: Influence of Mo to Fe Ratio on Heat-treatment Effects in Ti-Mo-Fe Alloys: *Masahiko Ikeda*[1]; Masato Ueda[1]; [1]Kansai University

P2-60: Research on Short-process Fabrication and Thixoforming of Semisolid Billet of Wrought Aluminum Alloys: *Jufu Jiang*[1]; [1]Harbin Institute of Technology

P2-61: Semi-solid Manufacturing Process of Micro Gears: *Long An*[1]; YongFei Wang[1]; JiaJi Liu[1]; [1]Xi'an Jiaotong University

P2-62: Stress Corrosion of the Mg-Zn-Zr Alloy System Using C-ring Tests: *Petra Maier*[1]; Nico Ostermeier[1]; Jens Wicke[1]; Norbert Hort[2]; [1]Stralsund University of Applied Sciences; [2]Helmholtz Zentrum Geesthacht

P2-63: Ultrafine Grained AZ61Mg/Ti Composite with High Mechanical Strength: *Lianxi Hu*[1]; Yuan Yuan[1]; [1]Harbin Institute of Technology

Materials for Nuclear Applications — Poster Session

Program Organizers: Philip Edmondson, Oak Ridge National Laboratory; Yutai Katoh, Oak Ridge National Laboratory; Jake Amoroso, Savannah River National Laboratory; Levi Gardner, University of Utah; Amy Gandy, University of Sheffield; Karl Whittle, University of Liverpool; Monica Ferraris, Politecnico di Torino

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Session Chairs: Philip Edmondson, Oak Ridge National Laboratory; Karl Whittle, University of Liverpool

P3-62: Characterization and Oxidation of Graphite and Silicon Carbide in TRISO Nuclear Fuel: *Adam Bratten*[1]; Jiaqi Duan[1]; Hans Pommerenke[1]; Haiming Wen[1]; [1]Missiouri University of Science & Technology

P3-63: Corrosion Behavior of Metallic Alloys in a Molten Chloride Eutectic Salt for Nuclear Applications: *Dominic Dinh*[1]; Vilupanur Ravi[1]; [1]Cal Poly Pomona

P3-64: Corrosion Behavior of Nanostructured Stainless Steels and High Entropy Alloys: *Hans Pommerenke*[1]; Andrew Hoffman[1]; Nathan Curtis[1]; Haiming Wen[1]; [1]Missouri University of Science and Technology

P3-65: Effects of Deposition Conditions on the Production of ZrO2 Coatings Produced by PE-CVD as Environmental Barrier Coatings for the Molten Salt Reactor: *Lester Espinoza*[1]; Eddie López Honorato[1]; [1]Centro de Investigación y de Estudios Avanzados del IPN

P3-67: Investigation of Recrystallization and Grain Growth in Uranium 10 wt% Molybdenum: *Jacqueline Reeve*[1]; Vineet Joshi[2]; David Field[1]; [1]Washington State University; [2]Pacific Northwest National Laboratory

P3-68: Oxidation of TRISO particles and Matrix Graphite in Mixed Gas Atmospheres: *Elizabeth Sooby Wood*[1]; Brian Brigham[1]; Katherine Montoya[1]; Marielle Gaspar[1]; Amanda Fernandez[1]; Zachary Acosta[1]; Tyler Gerczak[2]; [1]The University of Texas at San Antonio; [2]Oak Ridge National Laboratory

Materials Issues in Nuclear Waste Management — Poster Session

Program Organizers: Jake Amoroso, Savannah River National Laboratory; Kyle Brinkman, Clemson University; Kevin Fox, Savannah River National Laboratory; Cory Trivelpiece, Savannah River National Laboratory; Jarrod Crum, Pacific Northwest National Laboratory

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P3-69: Corrosion Test Method Evaluation for Iodine Waste Forms: *Amanda Lawter*[1]; R. Asmussen[1]; Jeff Bonnett[1]; Joelle Reiser[1]; Nancy Avalos[1]; Brian Riley[1]; [1]Pacific Northwest National Laboratory

P3-70: Glass Pool Flow in a Joule-Heated, Laboratory-Scale Melter: *Derek Cutforth*[1]; Derek Dixon[1]; Jesse Lang[1]; Will Eaton[1]; Mike Schweiger[1]; [1]Battelle Pacific N.W. National Laboratory

P3-71: Multi-scale Structural Response of Pyrochlore Oxides to Swift Heavy Ion Irradiation: *Eric O'Quinn*[1]; Igor Gussev[1]; William Cureton[1]; Devon Drey[1]; Joerg Neuefeind[2]; Maik Lang[1]; [1]University of Tennessee; [2]Oak Ridge National Laboratory

Mechanochemical Synthesis and Reactions in Materials Science IV — Poster Session

Program Organizers: Antonio Fuentes, Cinvestav Unidad Saltillo; Laszlo Takacs, University of Maryland Baltimore County; Challapalli Suryanarayana, University of Central Florida; Jacques Huot, Universite du Quebec a Trois-Rivieres

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P2-64: Ionic Conductors Synthesized by Mechanochemistry: Exploring the ZrO2-Y2O3-Gd2O3 System.: Karime A. González-García[1]; *José Alonso Díaz-Guillén*[1]; Sagrario Martínez Montemayor[2]; Oswaldo Burciaga-Díaz[1]; María Elena Bazaldua-Medellín[3]; Juan Carlos Díaz-Guillén[4]; Antonio F. Fuentes[3]; [1]Instituto Tecnologico de Saltillo; [2]CIQA; [3]CINVESTAV IPN Unidad Saltillo; [4]CONACYT-COMIMSA

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

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

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Session Chair: Martin Pech-Canul, Cinvestav IPN Saltillo

P2-66: Test and Evaluation of SiC/SiC Composites for High Temperature Components of the H-class Gas Turbine: In-Sub Han[1]; Seyoung Kim[1]; Soohyun Kim[1]; Young-Hoon Seong[1]; Jaehyung Choi[1]; *Hyungjoon Bang*[1]; [1]Korea Instute of Energy Research

P2-67: Hybrid Ceramic Matrix Composites: *Martin Pech-Canul*[1]; Socorro Valdez[2]; Evangelina Trujillo-Vazquez[3]; Juan Guía-Tello[4]; Máximo Pech-Canul[5]; Josué Aguilar-Martínez[6]; Luis González-López[1]; [1]Cinvestav IPN Saltillo; [2]UNAM; [3]Benemérita Universidad Autónoma de Puebla; [4]Centro de Investigación en Materiales Avanzados (CIMAV),; [5]Cinvestav IPN Mérida; [6]Universidad Autónoma de Nuevo León

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

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

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P2-68: Creep Compaction of Nanocrystalline Copper Powder: *Nathan Palmerio*[1]; Kexiang Zhao[1]; Lynnora Grant[1]; Zachary Cordero[1]; [1]Rice University

P2-69: Modeling the Critical Dynamic Recrystallization of a PM Ti-22Al-25Nb Alloy during Hot Compression Deformation: *Yu Sun*[1]; Lianxi Hu[1]; Yuan Yuan[1]; [1]Harbin Institute of Technology

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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P2-70: Characterization of Graphite-Si-SiC Ceamics Processed by Microwave Assisted Reactive Melt Infiltration: *Elisa Padovano*[1]; Mauro Giorcelli[1]; Giovanni Bianchi[2]; Sara Biamino[1]; Massimo Rovere[1]; Alberto Tagliaferro[1]; Alberto Ortona[2]; [1]Politecnico di Torino; [2]SUPSI

Retained Austenite for High and Ultrahigh Strength Steels — Poster Session

Program Organizer: Mahesh Somani, University of Oulu

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P3-94: The Relationships between Tensile Behavior and Hole Expansion Property of TRIP-aided Steels: *Jae Hoon Lee*[1]; Sang Ho Han[1]; [1]POSCO Technical Research Laboratories

Sintering and Related Powder Processing Science and Technologies — Poster Session

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

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P2-71: Field-induced Mass Transport Phenomena in Flash Sintered High Temperature Ceramics Explored by TEM and In situ SEM: *Xin Li Phuah*[1]; Han Wang[1]; Jaehun Cho[1]; Jin Li[1]; Sichuang Xue[1]; K.S.N. Vikrant[1]; Harry Charalambous[2]; Thomas Tsakalakos[2]; Amiya Mukherjee[3]; C. Stephen Hellberg[4]; Noam Bernstein[4]; R. Edwin Garcia[1]; Xinghang Zhang[1]; Haiyan Wang[1]; [1]Purdue University; [2]Rutgers University; [3]Uinversity of California, Davis; [4]Naval Research Laboratory

P2-72: Formation Mechanism of Porosity in P-type Bi0.5Sb1.5Te3 Materials and its Influence on Thermoelectric Transport Properties: *Cheenepalli Nagarjuna*[1]; Pathan Sharief[1]; Hyeon-Jeong You[1]; Peyala Dharmaiah[1]; Suk-Min Yoon[1]; Soon-Jik Hong[1]; [1]Kongju National University

P2-73: Investigation of Mechanical Properties of CoCrFeMnNi High Entropy Alloys Fabricated by Rapid Solidification Process: *Hyeon Jeong You*[1]; Kwang-Yong Jeong[1]; Cheenepalli Nagarjuna[1]; Raecheol Kang[1]; Soon-Jik Hong[1]; [1]Kongju National University

P2-74: Study on the Effect of Cu Dispersion on the Thermoelectric Properties of Bi-Sb-Te Alloy: *Seok Min Yoon*[1]; Chul hee Lee[1]; Cheenepali Nagarjuna[1]; Pathan sharief[1]; Soon jik Hong[1]; [1]Kongju National University

P2-75: Synthesis and Chemical Lixiviation of Nanostructured Calcium-doped Magnesium Aluminate Spinel: *Gilberto José Pereira*[1]; Rayanne Andrade[1]; [1]Centro Universitario Da Fei

P2-107: Influence of Spark Plasma Sintering Processing Parameters and Field Effects on the Microstructure and Mechanical Properties of Advanced Materials: *Tyler Dolmetsch*[1]; Arvind Agarwal[1]; Benjamin Boesl[1]; Cheng Zhang[1]; [1]Florida International University

Substrate Protection for Corrosion Prevention — Poster Session

Program Organizers: Mary Lyn Lim, PPG Industries; Qixin Zhou, The University of Akron; Niamh Hosking, Ford Motor Company; Matthew Asmussen, Pacific Northwestern National Laboratory; Elissa Trueman, NSWC Carderock Division; Cortney Crane, Exponent Failure Analysis Associates; Stephen Raiman, Oak Ridge National Laboratory; Raul Rebak, GE Global Research

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P3-107: Materials Performance and Corrosion Susceptibility Study of C-52 Steel Grades in Concentrated Media: *Ojo Sunday Fayomi*[1]; [1]Covenant University

Surface Protection for Enhanced Materials Performance: Science, Technology, and Application — Poster Session

Program Organizers: Kang Lee, NASA Glenn Research Center; Jun Song, McGill University; Yutaka Kagawa, University of Tokyo; 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; Stephen Yue, McGill University; Richard Chromik, McGill University

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Room: Exhibit Hall CD
Location: Oregon Convention Center

P2-76: Optimization of Microstructure and Mechanical Properties of MoSiN Coatings by Reactive Magnetron Sputtering Process Control: *Ki Buem Kim*[1]; Ki Seong Lim[1]; Young Seok Kim[1]; Jin Kyu Lee[2]; Taek Jib choi[1]; Hyo Soo Lee[3]; [1]Sejong University; [2]KongjuNational University; [3]Korea Institute of Industrial Technology

Synthesis, Characterization, Modeling and Applications of Functional Porous Materials — Poster Session

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

Tuesday PM
October 1, 2019
12:00 PM-1:00 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P2-77: A Novel Styrene-assisted Monomer Route for Polymer Derived Macroporous SiBCN Ceramic Monolith: *Xuan Cheng*[1]; Lujiao Yang[1]; Ying Zhang[1]; [1]Xiamen University

P2-78: An Atomic Force Microscopic Investigation on Single Secondary Particle of Silica Aerogel Monolith: *Xiaoyong He*[1]; Xuan Cheng[1]; Ying Zhang[1]; [1]Xiamen University

P2-79: Corrosion Studies of Open Cell Aluminum Foams in Simulated Marine Environments: *Ho Lun Chan*[1]; Kevin Guo[1]; Adam Teoh[1]; Rogine Gomez[1]; Vilupanur Ravi[1]; [1]Cal Poly Pomona

P2-80: Epoxy Foam Based Composites for Anechoic Chamber Application: From Elaboration to a Dielectric Characterization: Chloé Méjean[1]; Ratiba Benzerga[1]; *Hanadi Breiss*[1]; Aicha El Assal[1]; Ala Sharaiha[1]; [1]University Rennes, IETR

P2-81: Foam Composites for Planar Absorber Application: *Aicha El Assal*[1]; Ratiba Benzerga[1]; Ala Sharaiha[1]; Ali Harmouch[1]; Akil Jrad[1]; [1]University Rennes, IETR

P2-82: Inorganic Foam Composites for Absorption in X Band Frequency Range: *Ratiba Benzerga*[1]; Vincent Laur[2]; Ronan Lebullenger[3]; Laurent Le Gendre[1]; Ala Sharaiha[1]; [1]University of Rennes, IETR; [2]LabSTICC; [3]ISCR

P2-84: Rapid, Additive Synthesis of Functional Metal-organic Framework Thin Films: *Yujing Zhang*[1]; Chih-Hung Chang[1]; [1]Oregon State University

P2-85: Time-domain Thermoreflectance Investigation of the Thermal Conductivity for Amorphous Nano-porous Organo-Silicate Thin Films: *Hari Harikrishna*[1]; Scott Huxtable[1]; Ira Ben Shir[2]; Shifi Kababya[2]; Asher Schmidt[2]; David Gidley[3]; William Lanford[4]; Sean King[5]; [1]Virginia Tech; [2]Technion - Israel Institute of Technology; [3]University of Michigan; [4]University of Albany; [5]Intel

Thermomechanical Processing in Shaping and Forming of Steels — Poster Session

Program Organizers: Evgueni Poliak, Arcelormittal; Amy Clarke, Colorado School of Mines; Kester Clarke, Colorado School of Mines; Pello Uranga, CEIT and TECNUN (University of Navarra)

Tuesday PM
October 1, 2019
4:45 PM-5:45 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P3-95: Effect of Cold Rolling on Characteristics of Inclusions in 304 Stainless Steel: Xueliang Zhang[1]; Shufeng Yang[1]; Jingshe Li[1]; Jun Zhai[2]; *Mengjing Zhao*[1]; [1]University of Science and Technology Beijing; [2] Shanxi Taigang Stainless Steel Co., Ltd.

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, NASA Jet Propulsion Laboratory; Linruo Zhao, National Research Council of Canada

Tuesday PM
October 1, 2019
12:00 PM-1:00 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P2-86: Combinatorial Studies on Refractory High-entropy Alloys via Directed Vapor Deposition: *Christopher Kassner*[1]; Hengbei Zhao[1]; Haydn Wadley[1]; [1]University of Virginia

P2-87: Improvement of Technological Processes Obtaining a Heat-resistant Nickel Alloys for Turbine Blades Using Foundry Return: Vladimir Klochikhin[1]; *Valeriy Naumyk*[2]; [1]JSC «Motor Sich»; [2]Zaporozhye National Technical University

P2-88: Improvements in Mechanical Properties of Aerospace Grade Al-Li Alloys Through the Application of High-Pressure Torsion: *Taylor Herndon*[1]; [1]Oregon State University

Late News Poster Session — Additive Manufacturing

Tuesday PM
October 1, 2019
4:45 PM-5:45 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P3-38: 3D Characterization of Defects in Deep-powder-bed Manufactured Ti-6Al-4V and Influence on Tensile Properties: Joe Elambasseril[1]; Shenglu Lu[2]; Yapeng Ning[2]; Nan Liu[2]; Jian Wang[2]; Milan Brandt[1]; Huiping Tang[2]; *Ma Qian*[1]; [1]RMIT University; [2]State Key Laboratory of Porous Metal Materials, Northwest Institute for Nonferrous Metal Research

P3-39: 3D Printed Electronic Sensors and Authenthication: *Pedro Cortes*[1]; Michael Walker[1]; Guraarashjot Multani[1]; Carolyn Carradero[1]; Dillon Kennedy[1]; Brian Zellers[1]; Eric MacDonald[1]; [1]Youngstown State University

P3-40: 3D Printing of Refractory Alloys for Extreme Environments: *John Porter*[1]; Youping Gao[1]; [1]Castheon, Inc.

P3-41: Accelerating Alloy Development with Directed Energy Deposition: *Melanie Lang*[1]; [1]Formalloy

P3-42: Advantages of Open-source Additive Manufacturing: *Ulf Ackelid*[1]; Ulric Ljungblad[1]; Patrik Ohldin[1]; Robin Stephansen[1]; Martin Wildheim[1]; Fredrik Ostman[1]; [1]Freemelt AB

P3-43: Compression Behavior of Additively-manufactured Polymeric and Metallic Cellular Solids Composed of Tachi-Miura Polyhedron Cells: *Takahiro Kunimine*[1]; Hiromi Yasuda[2]; Jinkyu Yang[3]; [1]Kanazawa University; [2]University of Pennsylvania; [3]University of Washington

P3-44: Directed Energy Deposition for Complex, Gradient Material Components: *Melanie Lang*[1]; [1]Formalloy

P3-45: Effect of Heat Treatments on Microstructural Transformations and Properties of Wire-arc Additively Manufactured Nickel Aluminum Bronze: *Dharmendra Chalasani*[1]; Kanwal Chadha[1]; G.D. Janaki Ram[1]; Mohsen Mohammadi[1]; [1]Marine Additive Manufacturing Centre of Excellence

P3-47: Evaluation of Printability of Ecoefficient Cement Compositions Using Different Rheological Methods: Heitor Bernardo[1]; Estevão Laurito[1]; Alexandre Santos[2]; Valdecir Quarcioni[2]; *Roberto Romano*[1]; Rafael Pileggi[1]; [1]Escola Politécnica / Universidade de São Paulo; [2]Instituto de Pesquisas Tecnológicas

P3-48: Geometric Model and Density Variation in Binder Jetting 3D-printed Concrete: *Asif Ur Rehman*[1]; Vincenzo Sglavo[1]; [1]The University of Trento, Italy

P3-49: Influence of Part Positioning in Relation to the Build Plate on the Microstructure and Mechanical Properties of Electron Beam Melted Inconel 718 Parts: *Tizian Arold*[1]; Daniel Kotzem[2]; [1]Universität Kassel Material science department; [2]TU Dortmund University

P3-50: Investigation of Material Deformation Behavior under Dynamic Compressive Loading of Selective Laser Melted 316L Stainless Steel Samples: *Md Salah Uddin*[1]; Kristofer Kuelper[1]; Brahmananda Pramanik[1]; [1]Montana Technological University

P3-51: Investigation of Traditional vs. Designer Feedstock Powders for Additive Manufacturing: *Jack Grubbs*[1]; Kyle Tsaknopoulos[1]; Danielle Cote[1]; [1]Worcester Polytechnic Institute

P3-52: Optimisation of Mixture Properties for 3D Printing of Geopolymer Concrete: *Asif Ur Rehman*[1]; Vincenzo Sglavo[1]; [1]The University of Trento, Italy

P3-53: Serial Sectioning 3D Characterization of Defects in Additive Manufacturing Powders and Components: *Veeraraghavan Sundar*[1]; Rachel Reed[1]; [1]UES Inc

P3-54: Smart Snow and Ice Prevention System Engineering and Manufacturing: *Robert Burns*[1]; Ryan Miller[1]; Zhen Liu[1]; [1]Frostburg State University

P3-56: Three-dimensional Quantitative Characterization on Binder-jet Printed Powder Systems: *Chuyuan Zheng*[1]; Amir Mostafaei[2]; Pierangeli Rodriguez[1]; Markus Chmielus[1]; Ian Nettleship[1]; [1]University of Pittsburgh; [2]Carnegie Mellon University

P3-57: Unique Microstructure and Phase Transformation Behavior of High Carbon Tool Steel Layers Produced by Direct Energy Deposition Method: *Jongbae Jeon*[1]; Wookjin Lee[1]; Sunmi Shin[1]; Byungjun Kim[1]; [1]Korea Institute of Industrial Technology

Late News Poster Session — Energy

Tuesday PM
October 1, 2019
4:45 PM-5:45 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P3-72: Corrosion Performance of Alloyed Nuclear Waste Form: *Vineeth Kumar Gattu*[1]; William Ebert[1]; J Ernesto Indacochea[2]; [1]Argonne National Laboratory; [2]University of Illinois at Chicago

P3-73: Exploring Crucial Factors Affecting Cyclability of Silicon Dipohsphide: Role of Chemical Bonding and Interfaces with Carbon: *Byung Hoon Park*[1]; Geon Woo Lee[1]; Yeon Jun Choi[1]; Kwang Bum Kim[1]; [1]Yonsei University

P3-74: Germanium Selenide as an Attractive Anode Material for Potassium Ion Batteries: *Geon-Woo Lee*[1]; Byung Hun Park[1]; Young Hwan Kim[1]; Kwang-Bum Kim[1]; [1]Yonsei University

P3-75: In-package Material Corrosion: Major Source of Hydrogen in Breached Waste Container: *Eric Lee*[1]; James Jerden[2]; Vineeth Gattu[2]; William Ebert[2]; Ernesto Indacochea[1]; [1]University of Illinois, Chicago; [2]Argonne National Laboratory

P3-76: Measurement of Heat Transfer Coefficient in Interaction Zone of Multiple Liquid Jet Impingements: *Chaitanya Ghodake*[1]; [1]Bharat Forge

P3-77: Single Crystalline VO2 Nanobelts Prepared in Nanocellulose Templates for Li-ion Battery Applications: *Taekjib Choi*[1]; [1]Sejong University

P3-78: Structure-property Correlation of Isothermal Friction Stir Welding of 304L SS: *Madhumanti Bhattacharyya*[1]; Arnab Kundu[1]; Krishnan Raja[1]; Indrajit Charit[1]; Saumyadeep Jana[2]; Jens Darsell[2]; [1]University of Idaho; [2]Pacific Northwest National Laboratory

P3-79: Surface-engineered High-entropy Alloy for Catalyzing Oxygen Evolution Reaction: *Peiyan Ma*[1]; [1]Wuhan University of Technology

P3-80: Synthesis of SnO2/Nanoperforated Graphene Microball to Analyze the Effects of Nanoperforation under SnO_2 on Lithium/Sodium-ion Storage Performance: *Yeon Jun Choi*[1]; Kwang-Bum Kim[1]; [1]Yonsei University

P3-81: Uniformly Decorated Graphene Tube @ Graphene Microsphere for High Rate Supercapacitors: *Young Hwan Kim*[1]; Yeon Jun Choi[1]; Kwang-Bum Kim[1]; [1]Yonsei University

Late News Poster Session — Fundamentals and Characterization

Tuesday PM
October 1, 2019
12:00 PM-1:00 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P2-10: A Three-dimensional Study of the Grain Boundary Networks in Conventional and Grain Boundary Engineered 316L Stainless Steels: *Shuang Xia*[1]; Qin Bai[1]; Bangxin Zhou[1]; [1]Shanghai University

P2-11: Beware if you are Using Cobalt! Effect of Fluorescence and Microabsorption on XRD Patterns: *Anuj Rathi*[1]; William Boyer[1]; [1]Proto Manufacturing Inc.

P2-12: Characterization of Cadmium Whisker Growth Environment and Microstructure: *Rachel White*[1]; Zahra Ghanbari[1]; Donald Susan[1]; Sara Dickens[1]; [1]Sandia National Laboratory

P2-13: Characterization of the Microstructure Anisotropy during Co-firing in Solid Oxide Fuel Cell Electrodes/Electrolyte: *Shotaro Hara*[1]; Sakura Kaneki[1]; Zilin Yan[2]; Naoki Shikazono[2]; [1]Chiba Institute of Technology; [2]Institute of Industrial Sciences, The University of Tokyo

P2-14: Combining ^{27}Al Solid-state NMR and First-principles Simulations to Explore Crystal Structure in Disorder Aluminum Oxynitride: *Bingtian Tu*[1]; [1]Wuhan University of Technology

P2-15: Crystal Growth and Characterization of Anisotropic Thermoelectric Compounds: *David Smiadak*[1]; Alex Zevalkink[1]; Nicolas Rodriguez[2]; Geoffroy Hautier[3]; Richard Staples[1]; Gabi Schierning[2]; [1]Michigan State University; [2]Leibniz Institute for Solid State and Materials Research; [3]University of Louvain

P2-16: Factors Controlling Tensile Strength and Elongation of Aluminum Alloy during Partial Solidification: *Yoshihiro Nagata*[1]; Ryosuke Takai[2]; Rei Hirohara[3]; Naoki Endo[4]; Makoto Yoshida[1]; [1]Waseda University; [2]IHI Corp.; [3]Honda Engineering Co., Ltd.; [4]Kubota Corp.

P2-17: From Fundamental Research to Engineered Components: Application to 3D Materials Science: *Jonathan Madison*[1]; Thomas Ivanoff[1]; Alex HIckman[1]; [1]Sandia National Laboratories

P2-18: Microstructural Evolution of Austenitic Stainless Steel During Nitridation: *Alice Young*[1]; Milo Kral[1]; Catherine Bishop[1]; [1]University of Canterbury

P2-19: Predicting Compressive Strength of Consolidated Solids Using Computer Vision and Deep Learning: *Yong Han*[1]; Brian Gallagher[1]; Donald Loveland[1]; Matthew Rever[1]; T. Nathan Mundhenk[1]; Emily Robertson[1]; [1]Lawrence Livermore National Laboratory

P2-20: Processing-structure-property Relations in 70/30 Brass with Spatially Varying Grain Size Distributions: Nicholas Breeuwer[1]; Daniel Lewis[2]; Milo Kral[1]; *Catherine Bishop*[1]; [1]University of Canterbury; [2]Rensselaer Polytechnic Institute

P2-21: Spatial Distribution of Spherical Al3Ti Particles in Al-Al3Ti Composite by Equal-channel Angular Pressing and Multi-Directional Forging: *Sarath Babu Duraisamy*[1]; Hisashi Sato[1]; Yoshimi Watanabe[1]; [1]Nagoya Institute of Technology

P2-22: Use of Resonant Ultrasound Spectroscopy to Explore the Temperature Dependent Elasticity of Thermoelectric SnSe: *Ashoka Karunarathne*[1]; Gautam Priyadarshan[1]; Joseph Gladden[1]; [1]University of Mississippi

Late News Poster Session — Iron and Steel (Ferrous Alloys)

Tuesday PM
October 1, 2019
4:45 PM-5:45 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P3-96: A New Numerical Technique for Correction of the Stress-strain Curve and the Stress–strain Distribution on Neck Section in Tensile Specimen: *Farzad Fariba*[1]; [1]Azad Univercity

P3-97: Atomistic Approach in Transformation in Steels: *Kanwal Chadha*[1]; Mohammad Jahazi[1]; John Spray[2]; [1]Ecole De Technology Superiour; [2]UNB

P3-98: Electron Beam Re-melting to Improve Surface Properties of Hot Work Tool Steel: *Digvijay Sheed*[1]; [1]Bharat Forge Ltd.

P3-99: The Effects of Annealing Treatment on the Anisotropy Behavior for Cold Worked High-manganese Steels: *Byung Jun Kim*[1]; Minha Park[1]; Jong Bae Jeon[1]; Hyoung-Seok Moon[1]; Hyoung-Chan Kim[1]; [1]Korea Institute of Industrial Technology

Late News Poster Session — Materials-Environmental Interactions

Tuesday PM
October 1, 2019
4:45 PM-5:45 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P3-109: Application of Incoloy 800H Alloy in the Thermal Solar Energy System: Corrosion Test in MgCl2-KCl Heat Transfer Fluid: *Yuxiang Peng*[1]; Ramana Reddy[1]; [1]University of Alabama

P3-110: First-principles Investigation of Hydrogen Trapping in Chemistry Dependent Vacancies of Fe Cr Ni Alloys: *Patrick Thomas*[1]; Benjamin Sikora[1]; [1]Honeywell Fm&T

P3-111: Frictional Behaviour of 2-D Materials -- MoS2 and Graphene -- in Different Environments: *Ahmet Alpas*[1]; Zaixiu Yang[1]; Fatih Sen[2]; Sukanta Bhowmick[1]; [1]University of Windsor; [2]Argonne National Laboratory

P3-112: High Performing Sustainable Pylons: *Karnika De Silva*[1]; [1]University of Auckland-Nz

P3-113: Investigation on Slab Deterioration due to Carbonation in a Concrete Building: Eleni Araya[1]; [1]University of Johannesburg

Late News Poster Session — Processing and Manufacturing

Tuesday PM
October 1, 2019
12:00 PM-1:00 PM

Room: Exhibit Hall CD
Location: Oregon Convention Center

P2-91: Bioprocess Inspired Synthesis of Functional Materials: *Hao Xie*[1]; Hang Ping[1]; Panpan He[1]; Zhengyi Fu[1]; [1]Wuhan University of Technology

P2-92: Copper Particle Size Effect on the Microstructure and Mechanical Properties of Copper-based Transient Liquid Phase Sintering: *Khairi Faiz Muhammad*[1]; Yoshida Makoto[1]; [1]Waseda University

P2-93: Drilling study of Multi-directional Carbon Fiber Reinforced Polymers: *Kamlesh Phapale*[1]; [1]Bharat Forge Ltd

P2-94: Effect of Friction Stir Processing on Friction Stir Welded 5083 Aluminium Alloy Joints: *Velaphi Msomi*[1]; Siphokazi Mabuwa[1]; [1]Cape Peninsula University of Technology

P2-95: Effect of Mass Deposition on Fatigue Properties of Newly Developed Ultra-narrow Gap Multipass PC-GMA Weld for Thick Section: *Ramkishor Anant*[1]; P.K. Ghosh[1]; [1]Indian Institute of Technology Roorkee

P2-96: Estimate of Cutting Tools Wear in Turning: *Lucas Equeter*[1]; François Ducobu[1]; Edouard Rivière-Lorphèvre[1]; Pierre Dehombreux[1]; [1]University of Mons

P2-97: Fiber Laser Welding of Commercially Pure Titanium to Ti-6Al-4V Alloy: Alireza Abdollahi[1]; *Abu Syed Kabir*[1]; [1]Carleton University

P2-98: Genetic Algorithm Optimization of Process Parameters in Resistance Spot Welding of Automotive Steel Sheets: *Blériot Vincent Feujofack Kemda*[1]; Noureddine Barka[1]; Mohammad Jahazi[2]; Denis Osmani[3]; [1]Université du Québec à Rimouski; [2]École de Technologie Supérieure; [3]AMH Canada Ltée

P2-99: Laser Writing of Embedded Integrated Circuits: *Kimberly Gliebe*[1]; [1]University of Dayton; Air Force Research Laboratories

P2-100: NIST Data Infrastructure for Collection and Dissemination of Thermophysical Property Data for Metal Systems: *Boris Wilthan*[1]; [1]NIST

P2-101: Parameters Optimization for Double-sided Laser Beam Welding of Aluminum Alloy 5052-H32 Thin Sheet: Herinandrianina Ramiarison[1]; Noureddine Barka[1]; *Vincent Blériot Feujofack*[1]; Sofiene Amira[2]; [1]University of Québec in Rimouski; [2]Centre Québecois de Recherche et de Développement de l'Aluminium

P2-102: Press Blanking Process for Enhancing Edge Stretchability of GPa-grade Steels: Chanhee Won[1]; Hyoun Young Lee[2]; *Jonghun Yoon*[1]; [1]Hanyang University; [2]POSCO

P2-103: Recent Advances in Solid Phase Processing of Ultra-conductive Aluminum Alloys using Hot Extrusion Alloying: *Aditya Nittala*[1]; Lloyd Furuta[1]; Frank Kraft[1]; Alex Poznak[2]; Keerti Kappagantula[3]; [1]Ohio University; [2]Hydro Extrusion North America; [3]Pacific Northwest National Laboratory

P2-104: Study of the Kinetics of IMCs Precipitation during Solidification of an Al-Zn-Si-Mg Alloy, Using a Copper Wedge Mould Approach: Abdul Khaliq[1]; Daniel Parker[2]; Nega Setargew[2]; *Ma Qian*[1]; [1]RMIT University; [2]BlueScope Innovation; Australia/ARC Research Hub for Australian Steel Manufacturing, University of Wollongong

P2-105: Structural Formations in WFeNi(Ti) and MoFeNi(Ti) Layers under Intense Plastic Deformation Induced by Ball Collisions: *Sergey Romankov*[1]; [1]Chonbuk National University

P2-106: Substitutional Solid Solutions of Rare Earth Doped-ceria Elaborated by Chemical Co-precipitation: *Karla Maria Rangel-Arreola*[1]; Ena Athenea Aguilar-Reyes[1]; Carlos Alberto León-Patiño[1]; [1]Universidad Michoacana de San Nicolas de Hidalgo

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The MS&T 19 Networking Game

Organized by the ACerS Young Professionals Network (YPN)

Practice your networking skills! Network with individuals from the following professions and locations and fill in the categories below to have a chance to win. Plan to meet at the ACerS Lounge on *Wednesday, October 2 at 11:00 a.m.* to compete amongst your colleagues for a prize. Categories will be randomly selected - if you have that section filled out then you will be eligible to win. More networking means more chances… go forth and network!

	Name of Individual	Name of Institution or Company	Location	Topical Area
Talk to a **Professor** from a University located in:				
Eastern Standard Time (U.S.)				
Central Time (U.S.)				
Mountain Standard Time (U.S.)				
Pacific Standard Time (U.S.)				
Outside of the U.S.				
Talk to a **Student or Postdoc** from a University located in:				
Eastern Standard Time (U.S.)				
Central Time (U.S.)				
Mountain Standard Time (U.S.)				
Pacific Standard Time (U.S.)				
Outside of the U.S.				
Talk to an employee from a **National Lab** located in:				
Eastern Standard Time (U.S.)				
Central Time (U.S.)				
Mountain Standard Time (U.S.)				
Pacific Standard Time (U.S.)				
Outside of the U.S.				
Talk to an employee from a **Company or Vendor** located in:				
Eastern Standard Time (U.S.)				
Central Time (U.S.)				
Mountain Standard Time (U.S.)				
Pacific Standard Time (U.S.)				
Outside of the U.S.				

See if you can limit Your Topical Areas to: *Structural Ceramics, Refractories, Glass, Biomaterials, Electronic Materials, Art or Archaeology, Coatings or Thin Films, Metallurgy, Polymers*

EXHIBIT DIRECTORY

Technical Meeting and Exhibition

MS&T19

MATERIALS SCIENCE & TECHNOLOGY

SEPTEMBER 29 – OCTOBER 3, 2019

PORTLAND OREGON

MATSCITECH.ORG/MST19

WHERE MATERIALS INNOVATION HAPPENS

Organizers:

The American Ceramic Society www.ceramics.org

AIST Association for Iron & Steel Technology

ASM International

TMS The Minerals, Metals & Materials Society

Co-Sponsored by:

NACE International The Worldwide Corrosion Authority

HOW TO GET THE MOST FROM YOUR VISIT

You probably have your own special system for seeing a show. Whether you look for specific exhibitors first or start by looking for particular products or services, this directory will guide you. You will be able to find exactly what you need quickly and easily.

SHOW HOURS

Tuesday, October 1, 2019 | 10:00 a.m. – 6:00 p.m.

Refreshment Break	10:30 a.m.
Lunch on Show Floor	Noon – 2:00 p.m.
General Poster Session	1:00 p.m. – 6:00 p.m.
Exhibitor Networking Reception	4:00 p.m. – 6:00 p.m.

Wednesday, October 2, 2019 | 9:30 a.m. – 2:00 p.m.

Lunch on Show Floor	Noon – 2:00 p.m.

CONVENIENT INQUIRY SYSTEM

Your conference badge allows you to enter the exhibition during show hours. When visiting exhibits, please present your name badge to the exhibitor's representative to request additional information about products and services.

MESSAGE BOARD

A bulletin board for messages will be located in the registration area.

PHOTOGRAPHY/VIDEO EQUIPMENT

Please keep in mind that the exhibits are the property of the exhibiting companies. Photography and/or the recording of the exhibit hall or contents of any exhibitor booth are strictly prohibited at all times. Photography inside any exhibit space is limited to only the company that has contracted for the exhibit space or to an MS&T representative (or their contracted agent) with the consent of the exhibitor.

Because there may have been some late changes in booth assignments, some exhibitors may have a different booth number than was shown on their invitations and advertising. Please check the MS&T19 app or onsite signage for the most-up-to-date listings.

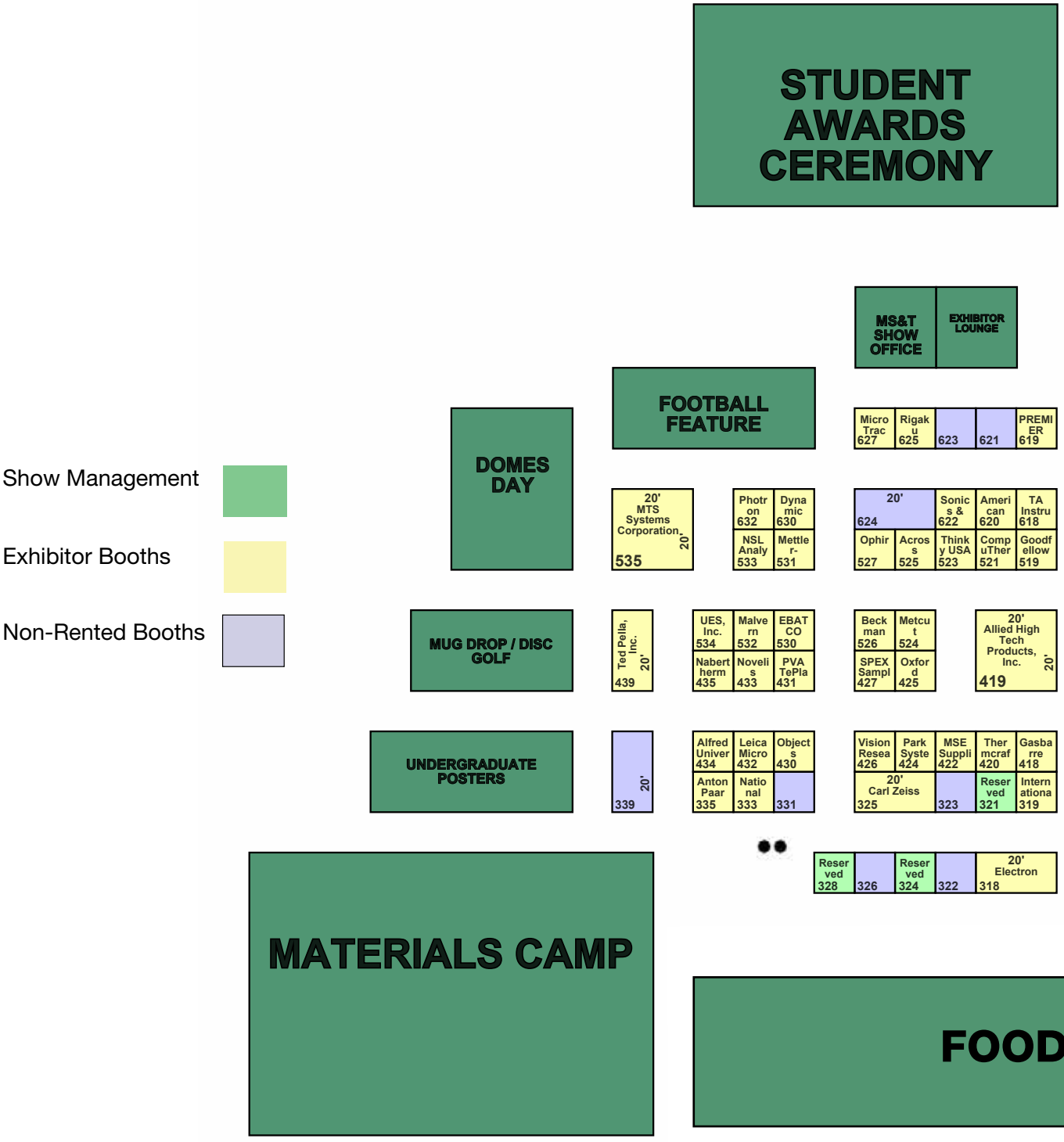
Reasonable precautions have been taken to avoid errors in and omissions from this directory.

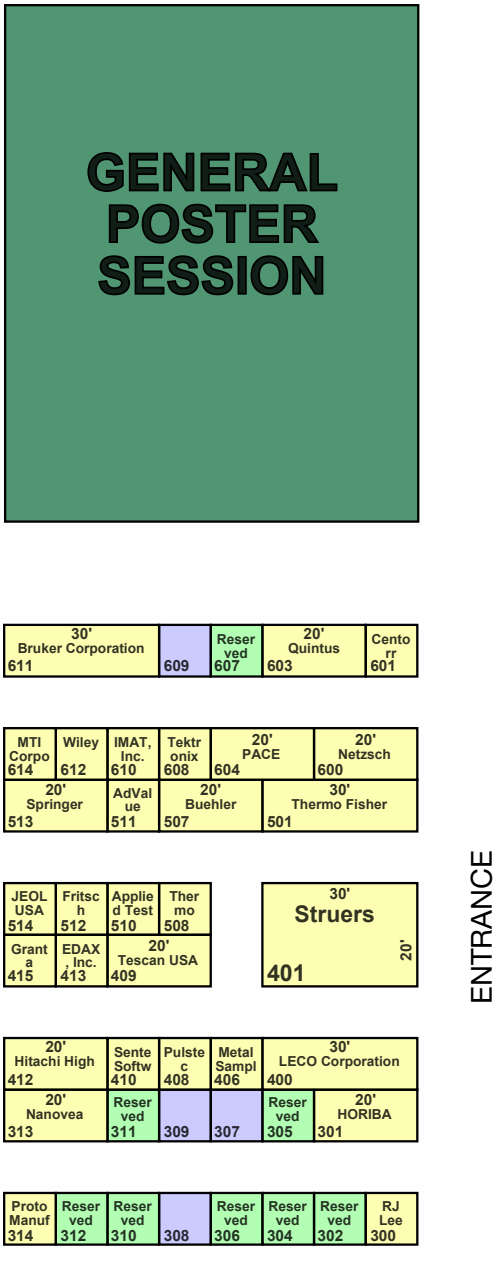
EXHIBITOR LIST (As of 8/6/19)

COMPANY	BOOTH
ACerS Young Professionals Network	609
Across International LLC	525
AdValue Technology	511
Alfred University (CACT)	434
Allied High Tech Products, Inc.	419
American Isostatic Presses, Inc.	620
ANSYS Granta	415
Anton Paar USA Inc.	335
Applied Test Systems	510
Assured Testing Services	331
Beckman Coulter	526
Bruker Corporation	611
Buehler	507
California Nanotechnologies	311
Carl Zeiss Microscopy LLC	325
Centorr Vacuum Industries	601
CompuTherm	521
Dynamic Systems Inc. (Gleeble)	630
EBATCO	530
EDAX, Inc.	413
Electron Microscopy Sciences	318
Fritsch Milling & Sizing	512
Gasbarre Products Inc. (PTX)	418
Goodfellow Corporation	519
Granta Design	415
Hitachi High Technologies America	412
HORIBA Instruments, Inc.	301
IMAT, Inc.	610
Indian Institute of Technology Delhi	321
International Centre for Diffraction Data (ICDD)	319
iX Cameras Inc.	621
JEOL USA Inc.	514
LECO Corporation	400
Leica Microsystems	432
Malvern Panalytical	532
Metal Samples Co.	406
Metcut Research	524
Mettler-Toledo, LLC	531
MicroTrac	627
MSE Supplies LLC	422
MTI Corporation	614

COMPANY	BOOTH
MTS Systems Corporation	535
Nabertherm Inc.	435
Nanovea	313
National Energy Technology Laboratory	333
Netzsch Instruments N.A. LLC	600
Novelis	433
NSL Analytical Services	533
Objects Research Systems	430
Ophir	527
Oxford Instruments	425
PACE Technologies	604
Park Systems	424
Photron USA, Inc.	632
PREMIER Lab Supply, Inc.	619
Proto Manufacturing	314
Pulstec	408
PVA TePla America Inc.	431
Quintus Technologies	603
Rigaku	625
RJ Lee Group	300
Sente Software	410
Sonics & Materials	622
SPEX SamplePrep	427
Springer	513
TA Instruments	618
Ted Pella, Inc.	439
Tektronix	608
Tescan USA	409
Tethon 3D	328
Thermal Technology LLC	323
Thermcraft Inc.	420
Thermo Calc Software Inc.	508
Thermo Fisher Scientific	501
Thinky USA Inc.	523
UES, Inc.	534
Vision Research	426
Wiley	612

FLOOR PLAN (As of 7/24/19)




GENERAL POSTER SESSION
30' Bruker Corporation 611
609
Reserved 607
20' Quintus 603
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MTI Corpo 614
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MS&T ANTI-HARASSMENT POLICIES

The Material Science and Technology Conference (MS&T) is organized by a partnership of the four leading materials science-related societies—ACerS, AIST, ASM International, and TMS.

All four partner societies are committed to ensuring that all MS&T activities are free from discrimination, harassment, and/or retaliation of any form. The MS&T partnership does not tolerate harassment in any form of anyone attending an MS&T event.

Each Society has its Anti-Harassment/Code of Conduct policies posted on its website:

The American Ceramic Society
https://ceramics.org/AntiHarrassment

Association For Iron and Steel Technology
https://www.aist.org/about-aist/leadership-governance/governance-policies

ASM International
https://www.asminternational.org/member-terms-and-conditions

The Minerals, Metals, and Materials Society (TMS)
https://www.tms.org/Code-of-Conduct

https://www.tms.org/Anti-Harassment-Policy

What to do:

Anyone who witnesses or is subject to any form of harassment has two options:

1. Immediately notify any MS&T staff members located at the MS&T registration area, information booths, or at one of the Society lounges. These MS&T staff members will immediately contact the MS&T leadership who will respond to you as soon as possible.

2. If you are a member of ACerS, AIST, ASM, TMS, please consult the above-referenced policies to determine to whom and how best to report an incident.

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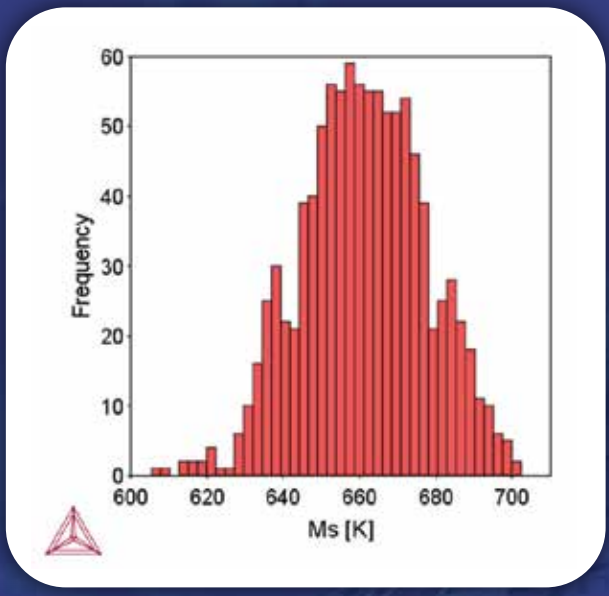

Calculated Ms temperatures for the 410 Stainless Steel composition range

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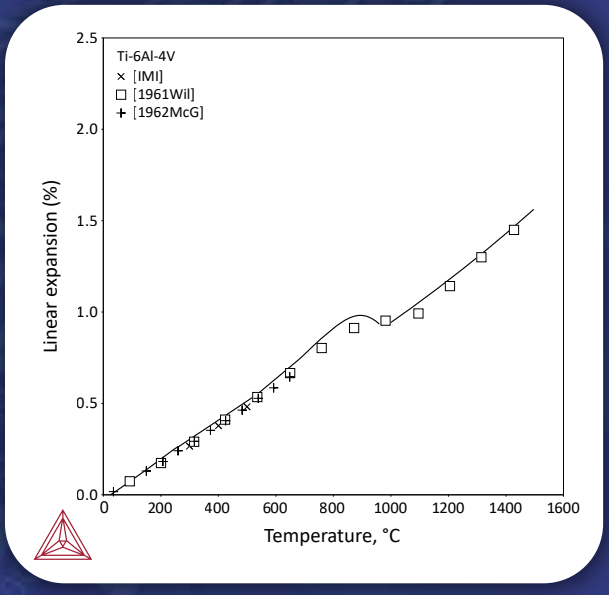
- ✓ **Steel model library** calculate martensite start and finish temperatures and pearlite growth as a function of composition
- ✓ **Python based API -** link Thermo-Calc, DICTRA, and TC-PRISMA to other packages using easy to learn Python language
- ✓ **New growth models in precipitation module** Paraequilibrium and Non-Partition Local Equilibrium are now supported
- ✓ **New databases** for Titanium, Nickel, Aluminium, Copper, and Oxide/Slag



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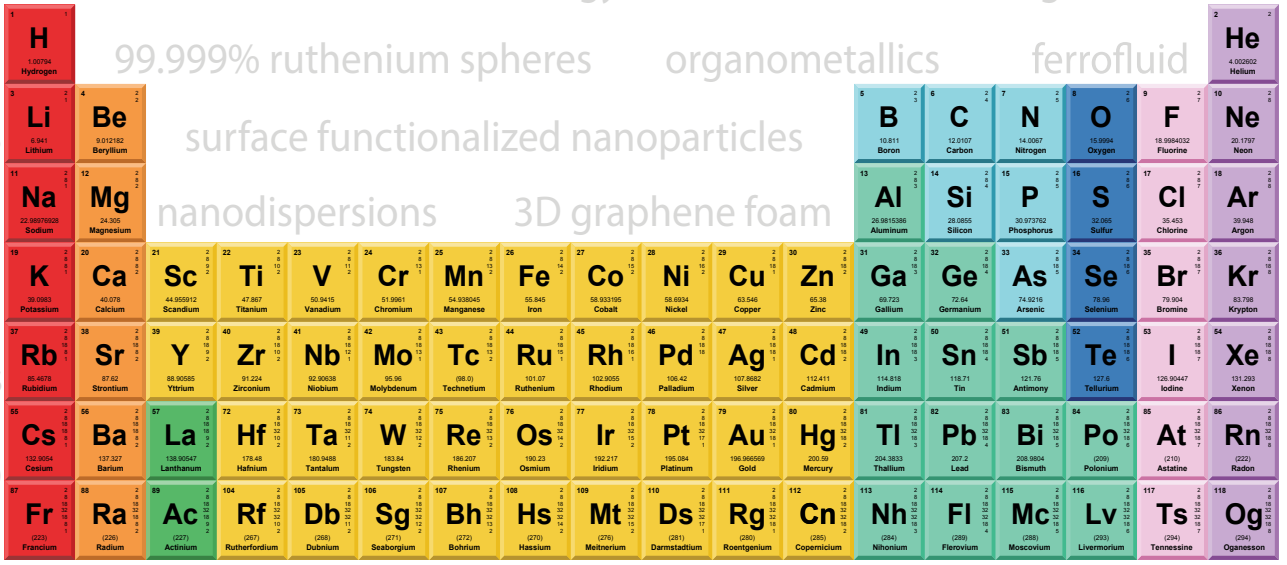

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