

March 15-19, 2015 • Walt Disney World • Orlando, Florida, USA

Connecting the global minerals, metals, and materials community.

FINAL PROGRAM

@TMSSociety #TMS2015Experience

www.tms.org/TMS2015

AP Technology[™]

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MAP KEY & PROGRAMMING

Walt Disney World Dolphin Hotel (HEADQUARTERS & PROGRAMMING)

- Registration
- Presenters' Coffee
- TMS2015 Exhibit
- Poster Session
- Technical Sessions on the following topics:
 - Additive Manufacturing and Joining Processes
 - Advanced Materials Properties and Performance
 - Functional Materials and Nanomaterials (Energy Storage and Nanomaterials focus)
 - ICME and Computational Modeling
 - Light Metals

Walt Disney World Swan Hotel (HEADQUARTERS & PROGRAMMING)

Technical Sessions on the following topics:

- Advanced Characterization of Materials
- Advances in Processing and Fabrication
- Functional Materials and Nanomaterials (Energy and Biomaterials focus)

Disney's Yacht & Beach Resorts (PROGRAMMING AT CONVENTION CENTER)

Opening Celebration

- Awards Banquet & Ceremony
- Materials Bowl
- Technical Sessions on the following topics:
 - Engineering Solutions for Sustainability
 - Extraction and Processing
 - Functional Materials and Nanomaterials (Thermoelectric and Solar Cell focus)
 - Nuclear Reactor Materials and Fuels
 - Materials for Energy and Sustainability

Disney's Coronado Springs Resort



Disney's Caribbean Beach Resort



Shuttle to Meeting Headquarters



Note: This is not a comprehensive listing of all activities happening at each hotel. For the complete list of activities and meetings taking place in each facility, see the Calendar of Events beginning on page 7.

Disney's Coronado Springs Resort 1.5 miles from Meeting Headquarters







Disney's Yacht & Beach Resort Convention Center



Walt Disney World Dolphin Resort

Walt Disney World Swan Resort



To Disney's Coronado Springs Resort

To Disney's Caribbean Beach Resort



PRESIDENT'S WELCOME MESSAGE





Dear Friends and Colleagues,

Welcome to the 144th installment of the TMS Annual Meeting & Exhibition! We are so pleased to have such a diverse group of colleagues gathered together in one place.

This year, we adopted a new slogan for our meeting: "Connecting the global minerals, metals, and materials community." We believe that the TMS Annual Meeting & Exhibition does this without equal—bringing together groups from diverse backgrounds and career stages to learn from one another, share ideas, and network. In short, we provide a place for our diverse community to *connect*.

In that spirit, we are offering a variety of ways for you to connect with your colleagues this week:

Take Advantage of Designated Networking Events and Spaces:

Some activities, like the TMS Opening Celebration and Exhibit Hall receptions, will give you the opportunity to interact with attendees from a broad range of technology areas and sectors; specialized events, like the Young Professional Happy Hour Reception or the Student Mixer, will allow you to connect with more targeted groups. A complete listing of networking and social events begins on page 27.

Learn from Technical Sessions:

With more than 3,500 technical presentations to choose from, we know you'll find a way to deepen your understanding of the field and find inspiration from those working in related technology areas. If you haven't already, take advantage of the scheduling tools available through the TMS2015 mobile application or the TMS Personal Conference Scheduler to create a detailed schedule for the week. A full listing of technical program offerings begins on page 63.

Go Beyond Technical Sessions:

Your education doesn't end in the session room. Learn about the newest products and technologies on the exhibit floor, and browse our robust Poster Gallery, located in the Atlantic Hall of the Dolphin Hotel, to further expand your knowledge.

Attend a Technical Committee Meeting:

There's no better way to find people who share your professional interests than by attending a TMS technical committee meeting. Dates, times, and locations for these meetings can be found in the Calendar of Events beginning on page 7.

Strike up a Friendly Conversation:

Want to connect with your colleagues but don't know how to begin? Try one of these casual conversation starters:

- Which book do you think should win the *JOM* Materials Fiction Countdown? (See page 17 to brush up on this topic.)
- Did you see the Bladesmithing Exhibit yet? They have more than 25 hand-forged blades on display!
- Have you donated to the TMS Foundation? If so, you can get your picture taken for the Faces of the Foundation collage.
- Or come up with your own conversation starter and tweet it to us using @TMSSociety and #TMS2015Experience.

There are many ways to connect with people who share your interests and with people who can expand your interests. I encourage you to spend this week meeting as many colleagues as you can and learning as much as you can. And I hope, when the meeting is over, you'll feel truly **connected** to your global minerals, metals, and materials community.

Sincerely,

Hani Henein 2014 TMS President

TMS 2015

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TIME TO TWEET!

Follow @TMSSociety or tweet using #TMS2015Experience.

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Registration

Your full-meeting registration badge provides you access to:

- Technical sessions
- Three-day pass to the TMS2015 Exhibition
- President's Welcoming Reception and Happy Hour Reception (located in the Exhibit Hall)
- Admission to the awards ceremony portion of the 2015 TMS & AIME Awards Banquet
- General Poster Session and Reception
- TMS Materials Bowl competition
- Technical Division Student Poster displays
- Admission to select social and networking events
- Online access to the complete collected proceedings

All attendees and meeting participants (presenters, exhibitors, etc.) must register for the meeting. Badges must be worn for admission to technical sessions, the exhibition hall, social functions, and other events.

Resort Information and Activities

For resort information and details about dining, park tickets, parking, resort transportation, entertainment, services and amenities, and more at TMS2015 properties please visit the following websites:



Walt Disney World Swan Resort www.swandolphin.com

Walt Disney World Dolphin Resort



Disney's Yacht & Beach Club Resorts https://disneyworld.disney.go.com/resorts/yachtclub-resort/

https://disneyworld.disney.go.com/resorts/beachclub-resort/



Disney's Caribbean Beach Resort https://disneyworld.disney.go.com/resorts/ caribbean-beach-resort/



Disney's Coronado Springs Resort https://disneyworld.disney.go.com/resorts/ coronado-springs-resort/

For Orlando area information, please visit the Orlando Convention and Visitors Bureau website at <u>www.visitorlando.com</u> or follow @visitorlando on Twitter.

TMS2015 Transportation

For your convenience, complimentary shuttles will run daily between the TMS2015 properties. Shuttles will depart from the Caribbean Beach and Coronado Springs Resorts and bring conference attendees to the Dolphin Hotel and the Yacht & Beach Convention Center every 15 to 30 minutes. Please see signs in the hotel lobbies for pick-up locations at each property.

Shuttle Schedule*

Sunday, March 15

6:30 a.m. to 10:00 p.m.

Monday, March 16

6:00 a.m. to 9:00 p.m.

Tuesday, March 17

6:00 a.m. to 8:00 p.m.

(Shuttles will be available at the Yacht & Beach Convention Center following the TMS & AIME Awards Banquet to return guests to the Caribbean Beach and Coronado Springs Resorts.)

Wednesday, March 18

6:00 a.m. to 7:30 p.m.

Thursday, March 19

Dolphin Hotel: 6:30 a.m. to 1:00 p.m. **Yacht & Beach:** 6:30 a.m. to 6:00 p.m.

*TMS2015 conference name badges required.

TMS2015 technical sessions are taking place in the Dolphin Hotel, the Swan Hotel, and the Yacht & Beach Convention Center. While these are within comfortable walking distance, TMS2015 attendees may also ride a pedal cab between the facilities. Pedal cabs will be available on the walkway between the Dolphin and Swan and at the Yacht & Beach Convention Center entrance.

WELCOME New TMS Members!

If you registered for TMS2015 at the full-conference nonmember rate, your registration includes membership in TMS for the remainder of 2015.

Select member benefits are highlighted throughout this meeting program to give you a taste of what your TMS membership offers. Visit the **TMS Information Center at Booth #401** in the exhibit hall to learn more about the advantages of being a TMS member.



Pedal Cab Schedule

Sunday, March 15 7:00 a.m. to 8:00 p.m.

Monday, March 16

6:00 a.m. to 8:00 p.m.

Tuesday, March 17

6:00 a.m. to 9:00 p.m.

Wednesday, March 18

6:00 a.m. to 8:00 p.m.

Thursday, March 19

7:00 a.m. to 5:00 p.m.

*TMS2015 conference name badges required.

Parking

Parking is available at the Dolphin Hotel for \$16/day (self-parking) or \$26/day (valet). Self-parking at Disney's Yacht & Beach Club Resort is complimentary.

Mobile App Information

Download the TMS2015 mobile application to serve as your hand-held guide to the meeting. This free conference tool is available on the App Store and the Google Play[™] Store. To download the App, search "TMS Annual Meeting" in your respective device store.

The App's features include:

- Latest programming schedule
- Complete abstracts
- Build your personal schedule and download to your device
- Speaker information
- Exhibit map
- Exhibitors and sponsors
- Venue information and much more!

TMS Member Benefit #1

Watch your mailbox every month for your print subscription to *JOM*, the member journal of TMS.

Source Analysis

Y Stay Informed with Twitter



What are you doing at TMS2015? We want to know! We'd love to hear about your #TMS2015Experience. Tweet it to @TMSSociety. You can also access TMS social media through the TMS2015 mobile application by selecting the Social Media icon from the app homepage (in the red box in the photo to the left). The TMS2015

App lets you monitor the @TMSSociety Twitter feed and TMS Facebook and LinkedIn pages without logging in to your social media account. To comment or post, you will need to log in to your social media account.

Business Centers

There is a full-service business center, 11th Hour, located in the Dolphin Hotel. For more information on available services, please visit <u>11thhourbiz.com/</u><u>about/locations/</u>. You may also reach them directly by calling (407) 934-4259 or emailing <u>dolphinbiz@live</u>.com.

Disney's Yacht & Beach Club Resort has a 24-hour business center located in the Beach Hotel. This business center is available for basic printing and computer needs. For information or assistance with large business needs please see the resort concierge.

Disney's Yacht & Beach Resort, Coronado Springs Resort, Caribbean Beach Resort, and the Walt Disney World Swan & Dolphin all have boarding pass printers located in the hotel lobby for guest convenience.



Internet Access

Swan & Dolphin

- Complimentary wireless internet is available in public areas including the hotel lobby and lounges. For those staying overnight at the Swan or Dolphin Hotels internet access is included in the resort fee.
- Complimentary wireless internet access is available at the TMS Connect Zone in Atlantic Hall at the Dolphin hotel. Access to this hall is restricted from 7:00 a.m. to 8:30 a.m. for Presenters' Coffee but will be open to all attendees from 8:30 a.m. until 4:00 p.m. Monday through Wednesday and until noon on Thursday. The "Connect Zone" will be closed from 11:30 a.m. to 2:00 p.m. on Wednesday.

Yacht & Beach Convention Center

 Complimentary wireless internet access is available in all public areas and overnight guest rooms.

Charging Stations

Recharge your mobile phones and tablets at the complimentary charging stations located in the Exhibit Hall.

Note about Time

All times printed in this program refer to Eastern Daylight Time.

Notice Regarding Technical Program Cancellations

Changing the times of presentations is disruptive to the program and may cause delegates to miss valuable presentations. So, we have asked symposium organizers and session chairs not to adjust presentation times in the event that a speaker is unable to deliver his or her talk due to international travel and/or visa issues resulting in late cancellation or "no show."

Navigation

Keep in mind that activities will be taking place throughout the week at three Disney properties. For a complete list of event and session rooms, see the Calendar of Events beginning on page 7, the TMS2015 App, and directional signage throughout the Dolphin Hotel, Swan Hotel, and Yacht & Beach Convention Center.

TMS INFORMATION CENTER

Hours of Operation:

Monday, March 16, 4:00 p.m. to 6:30 p.m. Tuesday, March 17, 10:00 a.m. to 5:30 p.m. Wednesday, March 18, 10:00 a.m. to 2:00 p.m. **Location:** Pacific Hall, Dolphin Hotel

The TMS Information Center is located at Booth #401 in the Exhibit Hall. The center provides information on all TMS offerings in one convenient location. Stop by to pick up your badge ribbons and to learn more about:

- TMS membership
- TMS technical initiatives
- TMS events
- TMS publications
- The TMS Foundation
- TMS volunteer opportunities



FACES OF THE FOUNDATION BOOTH

Hours of Operation:

Sunday, March 15, 7:00 a.m. to 5:00 p.m. Monday, March 16, 7:00 a.m. to 5:00 p.m. Tuesday, March 17, 7:00 a.m. to 2:00 p.m. Wednesday, March 18, 7:00 a.m. to 5:00 p.m. Thursday, March 19, 7:00 a.m. to Noon Location: Convention Foyer, Dolphin Hotel

To raise awareness of the good work that the TMS Foundation does every year, the TMS 2015 Annual Meeting & Exhibition will highlight the donors and recipients who are the "Faces of the Foundation." If you have benefitted from a TMS Foundation scholarship, award, or program OR if you have contributed to the TMS Foundation, stop by the Faces of the Foundation booth located in the Dolphin Hotel to have your picture taken and we'll add your image to the Faces of the Foundation collage that will be compiled over the course of the week. Help us show the entire community what supporting the TMS Foundation looks like.

NOT A DONOR YET?

Make a donation to the Foundation in any amount at the booth and have your photo added to the collage.

www.tms.org/TMS2015



MEETING POLICIES

Badges

All attendees must wear registration badges at all times during the meeting to ensure admission to events included in the paid fee such as technical sessions, exhibition, and receptions. "Exhibit Only" badges only provide admittance to the show floor for events in the exhibit hall. "Exhibit Only" attendees may not attend technical sessions.

New for TMS2015:

Guest Session Access

Each full-conference attendee is permitted up to two guests for one session at which they are presenting. This does not include colleagues or exhibitors. This access is intended for family members who wish to listen to a talk presented by their relative. No one under the age of 16 is permitted to attend. Please provide the names of the guests who will be attending your presentations at the registration desk. Guest Function Tickets may be purchased for social functions for your guests at registration.

Refund Policy

The deadline for all refunds was February 9, 2015. No refunds will be issued at the meeting. Fees and tickets are nonrefundable. TMS is not responsible for "no show" presenters. Presenters are scheduled and advertised in good faith based on the presenter's proposal to be included in the program.

Anti-Harassment Policy

TMS policy prohibits conduct that is disrespectful, unprofessional, or harassing as related to any number of factors including, but not limited to, religion, ethnicity, gender, national origin or ancestry, physical or mental disability, physical appearance, medical condition, partner status, age, sexual orientation, military and veteran status, or any other characteristic protected by relevant federal, state, or local law or ordinance or regulation. Failure to comply with this policy could lead to censure from the TMS Board of Directors, potential legal action, or other actions. Anyone who witnesses prohibited conduct or who is the target of prohibited verbal or physical conduct should notify a TMS staff member as soon as possible following the incident. It is the duty of the individual reporting the prohibited conduct to make a timely and accurate complaint so that the issue can be resolved swiftly.

Photography and Recording Policy



TMS reserves the right to all audio and video reproductions of presentations at TMS-sponsored meetings. By registering for this meeting, all attendees acknowledge that they may be photographed by TMS personnel while at events, and that those photos may be used for promotional purposes, in and on TMS publications and websites, and on social media sites.

Any recording of sessions (audio, video, still photography, etc.) intended for personal use, distribution, publication, or copyright without the express written consent of TMS and the individual authors is strictly prohibited. No photos are to be taken of any presenter's slides. Attendees violating this policy may be asked to leave the session or the meeting without refund.

Antitrust Compliance Policy

TMS complies with the antitrust laws of the United States. Attendees are encouraged to consult with their own corporate counsel for further guidance in complying with U.S. and foreign antitrust laws and regulations.

Americans with Disabilities Act

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TMS strongly supports the federal Americans with Disabilities Act (ADA) which prohibits discrimination against, and promotes public accessibility for, those with disabilities. In support of, and in compliance with ADA, we ask those requiring specific equipment or services to contact TMS Meeting Services in advance at 724-776-9000 or on-site at the TMS Information Center.

Cell Phone Use

In consideration of attendees and presenters, TMS kindly requests that you minimize disturbances by setting all cell phones or PDAs on "silent" while in meeting rooms.

Recycling

Discard badges and programs after the meeting in the bins located in the Registration area.

Be materials-minded.

Join TMS in reducing, reusing and recycling.



MEETING INFORMATION

Fun	ction	Date	Time	Facility	Room	Access			
	Saturday, M	arch 14							
Сс	ommittee and Business Meetings								
	Professional Registration Item Writers Workshop and Committee	3/14/2015	9:00 a.m. to 5:00 p.m.	Yacht & Beach	Cape Cod C	R			
	Financial Planning Committee	3/14/2015	2:00 p.m. to 5:00 p.m.	Yacht & Beach	Cape Cod A	R			
	Professional Registration Committee Dinner	3/14/2015	6:00 p.m. to 8:00 p.m.	Yacht & Beach	Cape Cod B	R			
	Sunday, Ma	rch 15							
AI	All-Conference Events								
	Registration	3/15/2015	7:00 a.m. to 6:00 p.m.	Dolphin	Atlantic Hall	0			
	Programming Support Desk	3/15/2015	12:00 p.m. to 6:00 p.m.	Dolphin	Atlantic Hall	0			
	General, Symposium, Young Professional, and Student Poster Session Set-up	3/15/2015	2:00 p.m. to 6:00 p.m.	Dolphin	Atlantic Hall	0			
	TMS2015 Opening Celebration	3/15/2015	5:00 p.m. to 6:30 p.m.	Yacht & Beach	Grand Harbor Ballroom North	0			
Ex	hibition								
	Exhibit Move-In	3/15/2015	8:00 a.m. to 5:00 p.m.	Dolphin	Pacific Hall	R			
Pr	ofessional Development & Special Presentations								
	Aluminum Melting Workshop	3/15/2015	8:00 a.m. to 12:00 p.m.	Swan	Macaw 1	Т			
	Explore the Use of the CALPHAD Modeling Tools for Your Daily Practice Workshop	3/15/2015	8:00 a.m. to 12:00 p.m.	Swan	Macaw 2	т			
	Mentorship for Young Scientists: Developing Scientific Survival Skills Workshop	3/15/2015	8:00 a.m. to 12:00 p.m.	Swan	Parrot 1	т			
	Characterization Techniques for Magnetic Materials Workshop	3/15/2015	8:00 a.m. to 4:30 p.m.	Swan	Parrot 2	Т			
	Friction Stir Welding & Processing Short Course	3/15/2015	8:00 a.m. to 4:30 p.m.	Swan	Peacock 1	Т			
	Multiphysics Materials Simulations using the Open Source MOOSE Framework Workshop	3/15/2015	8:00 a.m. to 4:30 p.m.	Swan	Macaw 1	т			
	Supplier Technology Workshop - Anode Carbon	3/15/2015	8:00 a.m. to 4:30 p.m.	Swan	Lark 1	Т			
	Supplier Technology Workshop - Reduction	3/15/2015	8:00 a.m. to 4:30 p.m.	Swan	Lark 2	Т			
	11th Annual Lead Free Solders and Interconnect Technology Workshop	3/15/2015	9:00 a.m. to 5:00 p.m.	Swan	Mockingbird 2	Т			
	Additive Manufacturing Materials and Processes Workshop	3/15/2015	1:00 p.m. to 5:30 p.m.	Swan	Macaw 2	Т			

🕭 Walt Disney World Swan Resort 🛛 🖉 Walt Disney World Dolphin Resort 👫 Disney's Yacht & Beach Club Resorts

O - Open to all attendees R - Restrictions Apply I - Invitation Only T - Ticketed Event, Pre-registration required



Professional Development Courses Begin Sunday at 8:00 a.m.

Sign up for one of these courses in the Registration area at the Dolphin Hotel or visit *www.tms.org/pd* for a list of upcoming Professional Development events from TMS.

www.tms.org/TMS2015



Function	Date	Time	Facility	Room	Access
Student Events	·				
Materials Bowl		12:00 p.m. to 7:00 p.m.			
Elimination Rounds	3/15/2015	12:00 p.m. to 4:00 p.m.	Yacht & Beach	Grand Harbor Ballroom	0
Championship Round		6:30 p.m. to 7:00 p.m.		Salons 5-7	
Student Networking Mixer	3/15/2015	7:00 p.m. to 9:00 p.m.	Yacht & Beach	Grand Harbor Ballroom South	0
Social Functions					
Faces of the TMS Foundation	3/15/2015	7:00 a.m. to 5:00 p.m.	Dolphin	Convention Registration Foyer	0
TMS Fellows and Invited Guests Reception	3/15/2015	4:30 p.m. to 6:30 p.m.	Dolphin	Premiere Suite	I.
Committee & Business Meetings					
Professional Registration Leadership Committee	3/15/2015	8:00 a.m. to 11:00 a.m.	Yacht & Beach	Stonington	R
New Board Member Orientation	3/15/2015	8:30 a.m. to 10:00 a.m.	Yacht & Beach	Cape Cod A&B	I
TMS Board of Directors Meeting	3/15/2015	10:00 a.m. to 12:00 p.m.	Yacht & Beach	Cape Cod A&B	R
Recycling and Environmental Technologies Committee	3/15/2015	12:00 p.m. to 1:30 p.m.	Yacht & Beach	Saybrook	0
Accreditation Committee	3/15/2015	12:30 p.m. to 2:30 p.m.	Yacht & Beach	Cape Cod C	0
Program Committee	3/15/2015	1:00 p.m. to 2:00 p.m.	Yacht & Beach	Asbury B	R
Web User Testing	3/15/2015	1:00 p.m. to 4:00 p.m.	Dolphin	Oceanic 4	R
Magnesium Committee	3/15/2015	1:30 p.m. to 3:00 p.m.	Yacht & Beach	Asbury A	0
TMS Nominating Committee	3/15/2015	2:00 p.m. to 3:00 p.m.	Yacht & Beach	Stonington	I
Aluminum Committee	3/15/2015	2:00 p.m. to 4:00 p.m.	Yacht & Beach	Asbury B	0
Materials Characterization Committee	3/15/2015	2:30 p.m. to 4:00 p.m.	Yacht & Beach	Saybrook	0
JOM Advisor Orientation	3/15/2015	3:00 p.m. to 4:00 p.m.	Yacht & Beach	Cape Cod D	R
PRICM-9 International Organizing Committee	3/15/2015	3:00 p.m. to 5:00 p.m.	Dolphin	Oceanic 7	I
ABET Refresher Training	3/15/2015	3:00 p.m. to 6:00 p.m.	Yacht & Beach	Cape Cod B	0
Public & Governmental Affairs Committee	3/15/2015	3:30 p.m. to 5:00 p.m.	Yacht & Beach	Cape Cod C	0
Hydrometallurgy and Electrometallurgy Committee	3/15/2015	4:00 p.m. to 5:00 p.m.	Yacht & Beach	Grand Harbor Ballroom Salon 1	0
Nanomaterials Committee	3/15/2015	4:00 p.m. to 5:00 p.m.	Yacht & Beach	Grand Harbor Ballroom Salon 2	0
Thin Films and Interfaces Committee	3/15/2015	4:00 p.m. to 5:00 p.m.	Yacht & Beach	Grand Harbor Ballroom Salon 3	0
Women in Materials Science & Engineering Committee	3/15/2015	4:30 p.m. to 5:30 p.m.	Yacht & Beach	Asbury B	0
Materials Innovation Committee	3/15/2015	5:30 p.m. to 7:00 p.m.	Yacht & Beach	Cape Cod A	0
Nanomechanical Materials Behavior Committee	3/15/2015	5:45 p.m. to 6:45 p.m.	Yacht & Beach	Grand Harbor Ballroom Salon 1	0
Process Technology and Modeling Committee	3/15/2015	6:00 p.m. to 7:00 p.m.	Yacht & Beach	Grand Harbor Ballroom Salon 3	0

🕐 Walt Disney World Swan Resort 🛛 🥃 Walt Disney World Dolphin Resort 👫 Disney's Yacht & Beach Club Resorts

O - Open to all attendees R - Restrictions Apply I - Invitation Only T - Ticketed Event, Pre-registration required



MEETING INFORMATION

Function	Date	Time	Facility	Room	Access
Pyrometallurgy Committee	3/15/2015	6:00 p.m. to 7:30 p.m.	Yacht & Beach	Grand Harbor Ballroom Salon 2	0
Professional Development Committee	3/15/2015	6:00 p.m. to 8:00 p.m.	Yacht & Beach	Asbury A	R
Content Development and Dissemination Committee	3/15/2015	6:00 p.m. to 8:00 p.m.	Yacht & Beach	Cape Cod C	I
Mechanical Behavior of Materials Committee	3/15/2015	7:00 p.m. to 8:30 p.m.	Yacht & Beach	Grand Harbor Ballroom Salon 8	0
Alloy Phases Committee	3/15/2015	7:30 p.m. to 9:30 p.m.	Yacht & Beach	Cape Cod D	0
Phase Transformation Committee	3/15/2015	7:30 p.m. to 9:30 p.m.	Yacht & Beach	Cape Cod A	0
Monday, Ma	arch 16				
All-Conference Events					
Registration	3/16/2015	7:00 a.m. to 6:00 p.m.	Dolphin	Atlantic Hall	0
Programming Support Desk	3/16/2015	7:00 a.m. to 6:00 p.m.	Dolphin	Atlantic Hall	0
Presenters' Coffee	3/16/2015	7:00 a.m. to 8:00 a.m.	Dolphin	Atlantic Hall	R
General, Symposium, Young Professional, and Student Poster Session Set-up	3/16/2015	8:00 a.m. to 12:00 p.m.	Dolphin	Atlantic Hall	0
Technical Programming	3/16/2015	8:30 a.m. to 5:30 p.m.	See Technical I	Program section	0
Morning Break	3/16/2015	9:50 a.m. to 10:30 a.m.	for complete schedule and locations		0
Afternoon Break	3/16/2015	3:20 p.m. to 4:00 p.m.			0
Poster Session Presentations and Reception	3/16/2015	6:30 p.m. to 8:30 p.m.	Dolphin	Atlantic Hall	0
Young Professional Meet the Candidate Poster Session	3/16/2015	6:30 p.m. to 8:30 p.m.	Dolphin	Atlantic Hall	0
Exhibition					
TMS2015 Exhibition	3/16/2015	4:00 p.m. to 6:30 p.m.	Dolphin	Pacific Hall	0
TMS Information Center	3/16/2015	4:00 p.m. to 6:30 p.m.	Dolphin	Booth 401	0
Bladesmithing Competition	3/16/2015	4:00 p.m. to 6:30 p.m.	Dolphin	Booth 235	0
President's Welcoming Reception	3/16/2015	5:00 p.m. to 6:30 p.m.	Dolphin	Atlantic/Pacific Halls	0
Special Presentations					
EPD Distinguished Lecture	3/16/2015	8:30 a.m. to 9:10 a.m.	Yacht & Beach	Grand Harbor Ballroom Salon 2	0
Magnesium Technology 2015 Keynote Session	3/16/2015	8:30 a.m. to 10:50 a.m.	Dolphin	Northern Hemisphere E1	0
Light Metals Keynote Session: Latest Developments in Smelting of Light Metals	3/16/2015	8:30 a.m. to 12:00 p.m.	Dolphin	Southern Hemisphere I, II, III	0
Student Events					
Technical Division Student Poster Contest	3/16/2015	3:30 p.m. to 5:30 p.m.	Dolphin	Atlantic Hall	0
Social Functions					
Women in Materials Science & Engineering Breakfast	3/16/2015	7:00 a.m. to 8:00 a.m.	Dolphin	Americas Seminar	Т

A Walt Disney World Swan Resort 🧳 Walt Disney World Dolphin Resort 🚯 Disney's Yacht & Beach Club Resorts

O - Open to all attendees R - Restrictions Apply I - Invitation Only T - Ticketed Event, Pre-registration required





MEETING INFORMATION

CALENDAR OF EVENTS

Function	Date	Time	Facility	Room	Access
Faces of the TMS Foundation	3/16/2015	7:00 a.m. to 5:00 p.m.	Dolphin	Convention Registration Foyer	0
Connect Zone	3/16/2015	8:30 a.m. to 4:00 p.m.	Dolphin	Atlantic Hall	0
SMD Luncheon	3/16/2015	12:00 p.m. to 2:00 p.m.	Swan	Osprey 1	Т
IOMMMS Council Reception	3/16/2015	4:30 p.m. to 5:30 p.m.	Dolphin	Europe 6	- I
Meet-a-Mentor	3/16/2015	5:00 p.m. to 6:00 p.m.	Dolphin	Northern Hemisphere D	Т
Young Professionals Reception	3/16/2015	6:00 p.m. to 7:00 p.m.	Dolphin	Northern Hemisphere D	0
Stefanescu Honorary Dinner	3/16/2015	6:30 p.m. to 9:30 p.m.	Dolphin	Americas Seminar	Т
Nagy El-Kaddah Memorial Dinner	3/16/2015	6:30 p.m. to 9:30 p.m.	Swan	Osprey 1	Т
Committee & Business Meetings					
Metallurgical and Materials Transactions A Board of Review	3/16/2015	7:00 a.m. to 8:00 a.m.	Yacht & Beach	Saybrook	I
Membership & Student Development Committee	3/16/2015	8:45 a.m. to 10:00 a.m.	Dolphin	Europe 4	R
TMS Executive Committee	3/16/2015	10:00 a.m. to 11:00 a.m.	Yacht & Beach	Stonington	R
TMS Past Presidents Meeting	3/16/2015	11:30 a.m. to 1:00 p.m.	Dolphin	Europe 6	I.
Superalloys 2016 Program Committee	3/16/2015	12:00 p.m. to 2:00 p.m.	Yacht & Beach	Cape Cod B	I
Integrated Computational Materials Engineering Committee	3/16/2015	12:15 p.m. to 1:45 p.m.	Dolphin	Europe 4	0
Powder Materials Committee	3/16/2015	12:30 p.m. to 2:00 p.m.	Swan	Lark	0
Superalloys 2016 Organizing Committee	3/16/2015	5:00 p.m. to 7:00 p.m.	Yacht & Beach	Hampton	I
Composite Materials Committee	3/16/2015	5:45 p.m. to 6:45 p.m.	Dolphin	Asia 5	0
Advanced Characterization, Testing and Simulation Committee	3/16/2015	5:45 p.m. to 6:45 p.m.	Swan	Pelican 2	0
Solidification Committee	3/16/2015	6:00 p.m. to 7:00 p.m.	Swan	Swan Ballroom Salon 1	0
Biomaterials Committee	3/16/2015	6:00 p.m. to 7:00 p.m.	Swan	Swan Ballroom Salon 9	0
Energy Conversion and Storage Committee	3/16/2015	6:00 p.m. to 7:00 p.m.	Yacht & Beach	Grand Harbor Ballroom Salon 1	0
Chemistry and Physics of Materials Committee	3/16/2015	6:00 p.m. to 7:30 p.m.	Yacht & Beach	Grand Harbor Ballroom Salon 4	0
Nuclear Materials Committee	3/16/2015	6:00 p.m. to 7:30 p.m.	Yacht & Beach	Grand Harbor Ballroom Salon 2	0
Materials & Society Committee	3/16/2015	6:00 p.m. to 8:00 p.m.	Yacht & Beach	Cape Cod B	I
Magnetic Materials Committee	3/16/2015	7:00 p.m. to 8:00 p.m.	Yacht & Beach	Grand Harbor Ballroom Salon 7	0

	Tuesday, March 17							
Α	All-Conference Events							
	Registration	3/17/2015	7:00 a.m. to 5:30 p.m.	Dolphin	Atlantic Hall	0		
	Programming Support Desk	3/17/2015	7:00 a.m. to 6:00 p.m.	Dolphin	Atlantic Hall	0		

Walt Disney World Swan Resort Walt Disney World Dolphin Resort Disney's Yacht & Beach Club Resorts
O - Open to all attendees R - Restrictions Apply
I - Invitation Only
T - Ticketed Event, Pre-registration required



Function	Date	Time	Facility	Room	Access
Presenters' Coffee	3/17/2015	7:00 a.m. to 8:00 a.m.	Dolphin	Atlantic Hall	R
Poster Gallery	3/17/2015	8:30 a.m. to 5:30 p.m.	Dolphin	Atlantic Hall	0
Technical Programming	3/17/2015	8:30 a.m. to 5:30 p.m.			0
Morning Break	3/17/2015	9:50 a.m. to 10:30 a.m.	for complete	Program section schedule and	0
Afternoon Break	3/17/2015	3:20 p.m. to 4:00 p.m.	locations		0
Exhibition					
TMS2015 Exhibition	3/17/2015	10:00 a.m. to 5:30 p.m.	Dolphin	Pacific Hall	0
TMS Information Center	3/17/2015	10:00 a.m. to 5:30 p.m.	Dolphin	Booth 401	0
Bladesmithing Competition	3/17/2015	10:00 a.m. to 5:30 p.m.	Dolphin	Booth 235	0
Bladesmithing Awards Presentation	3/17/2015	1:30 p.m. to 2:00 p.m.	Dolphin	Booth 235	0
Happy Hour Reception	3/17/2015	4:30 p.m. to 5:30 p.m.	Dolphin	Pacific Hall	0
Special Presentations					
Young Professional Tutorial Luncheon & Lecture	3/17/2015	12:00 p.m. to 2:00 p.m.	Dolphin	Northern Hemisphere D	т
Student Events					
Student Career Forum	3/17/2015	2:30 p.m. to 4:30 p.m.	Dolphin	Northern Hemisphere D	0
Social Functions					
Faces of the TMS Foundation	3/17/2015	7:00 a.m. to 5:00 p.m.	Dolphin	Convention Registration Foyer	0
Connect Zone	3/17/2015	8:30 a.m. to 4:00 p.m.	Dolphin	Atlantic Hall	0
EPD/MPMD Joint Luncheon Lecture	3/17/2015	12:00 p.m. to 2:00 p.m.	Dolphin	Americas Seminar	Т
TMS Foundation Silent Auction	3/17/2015	4:00 p.m. to 10:00 p.m.	Yacht & Beach	Grand Harbor Ballroom Lobby	0
TMS & AIME Awards Reception	3/17/2015	5:30 p.m. to 6:30 p.m.	Yacht & Beach	Grand Harbor Ballroom Lobby	0
TMS & AIME Awards Ceremony	3/17/2015	6:30 p.m. to 7:45 p.m.	Yacht & Beach	Grand Harbor Ballroom North	0
TMS & AIME Awards Banquet	3/17/2015	7:45 p.m. to 9:30 p.m.	Yacht & Beach	Grand Harbor Ballroom South	т
Committee & Business Meetings					
Electronic Packaging and Interconnection Materials Committee	3/17/2015	7:00 a.m. to 8:00 a.m.	Dolphin	Europe 4	0
Metallurgical and Materials Transactions B Board of Review	3/17/2015	7:00 a.m. to 8:00 a.m.	Yacht & Beach	Saybrook	T
Fellows Award Committee	3/17/2015	7:30 a.m. to 8:30 a.m.	Yacht & Beach	Cape Cod D	R
Pan American Conference Planning Meeting	3/17/2015	7:30 a.m. to 9:30 a.m.	Yacht & Beach	Cape Cod B	I.
Young Professionals Committee	3/17/2015	8:15 a.m. to 9:45 a.m.	Dolphin	Northern Hemisphere D	0
Honors & Professional Recognition Committee	3/17/2015	8:30 a.m. to 9:30 a.m.	Yacht & Beach	Cape Cod D	R

Walt Disney World Swan Resort
Walt Disney World Dolphin Resort
Disney's Yacht & Beach Club Resorts
O - Open to all attendees
R - Restrictions Apply
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TMS 2015

CALENDAR OF EVENTS

Function	Date	Time	Facility	Room	Access
3rd Pan American Planning Meeting	3/17/2015	7:30 a.m. to 9:00 a.m.	Yacht & Beach	Cape Cod B	I
TMS-CSM 2017 Energy Materials Conference Discussion	3/17/2015	10:30 a.m. to 11:30 a.m.	Yacht & Beach	Cape Cod C	R
TMS-CSM Leadership	3/17/2015	11:30 a.m. to 1:30 p.m.	Yacht & Beach	Stonington	R
Education Committee	3/17/2015	12:30 p.m. to 2:00 p.m.	Yacht & Beach	Cape Cod D	0
Web Testing	3/17/2015	1:00 p.m. to 4:00 p.m.	Dolphin	Europe 4	R
Titanium Committee	3/17/2015	5:00 p.m. to 6:00 p.m.	Swan	Osprey 1	0
Energy Committee	3/17/2015	5:00 p.m. to 6:00 p.m.	Yacht & Beach	Grand Harbor Ballroom Salon 4	0
Shaping and Forming Committee	3/17/2015	5:00 p.m. to 7:00 p.m.	Yacht & Beach	Cape Cod A	0
Computational Materials Science & Engineering Committee	3/17/2015	5:45 p.m. to 6:45 p.m.	Dolphin	Oceanic 3	0
Refractory Metals & Materials Committee	3/17/2015	5:45 p.m. to 6:45 p.m.	Dolphin	Europe 1	0
High Temperature Alloys Committee	3/17/2015	5:45 p.m. to 7:15 p.m.	Dolphin	Oceanic 7	0
Titanium 2015 Organizing Committee	3/17/2015	6:00 p.m. to 7:00 p.m.	Swan	Osprey 1	R
Wednesday, I	March 1	8			
All-Conference Events					
Registration	3/18/2015	7:00 a.m. to 5:00 p.m.	Dolphin	Atlantic Hall	0
Programming Support Desk	3/18/2015	7:00 a.m. to 6:00 p.m.	Dolphin	Atlantic Hall	0
Presenters' Coffee	3/18/2015	7:00 a.m. to 8:00 a.m.	Dolphin	Atlantic Hall	R
Poster Gallery	3/18/2015	8:30 a.m. to 12:00 p.m.	Dolphin	Atlantic Hall	0
Technical Programming	3/18/2015	8:30 a.m. to 5:30 p.m.	Soo Tochnical I	Program soction	0
Morning Break	3/18/2015	9:50 a.m. to 10:30 a.m.	for complete	schedule and	0
Afternoon Break	3/18/2015	3:20 p.m. to 4:00 p.m.	loca	tions	0
Poster Session - Tear Down	3/18/2015	12:00 p.m. to 5:00 p.m.	Dolphin	Atlantic Hall	0
Exhibition					
TMS2015 Exhibition	3/18/2015	10:00 a.m. to 2:00 p.m.	Dolphin	Pacific Hall	0
TMS Information Center	3/18/2015	10:00 a.m. to 2:00 p.m.	Dolphin	Booth 401	0
Bladesmithing Competition	3/18/2015	10:00 a.m. to 2:00 p.m.	Dolphin	Booth 235	0
Lunch in Exhibition Hall	3/18/2015	11:30 a.m. to 1:30 p.m.	Dolphin	Pacific Hall	0
Special Presentations					
Engineering Solutions for Sustainability Plenary I	3/18/2015	8:30 a.m. to 10:10 a.m.	Yacht & Beach	Grand Harbor Ballroom North	0
Engineering Solutions for Sustainability Poster Set-up	3/18/2015	10:00 a.m. to 5:00 p.m.	Yacht & Beach	Asbury Lobby	0
Student Fustions					

	Student Send-off Lunch	3/18/2015	11:30 a.m. to 1:30 p.m.	Dolphin	Atlantic Hall
S	ocial Functions				
	Faces of the TMS Foundation	3/18/2015	7:00 a.m. to 5:00 p.m.	Dolphin	Convention Registration Foyer

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Function	Date	Time	Facility	Room	Access
Connect Zone	3/18/2015	8:30 a.m. to 11:30 a.m.	Dolphin	Atlantic Hall	0
LMD Luncheon	3/18/2015	12:00 p.m. to 2:00 p.m.	Dolphin	Southern Hemisphere 1	Т
Connect Zone	3/18/2015	2:00 p.m. to 4:00 p.m.	Dolphin	Atlantic Hall	0
Engineering Solutions for Sustainability Reception	3/18/2015	5:30 p.m. to 7:30 p.m.	Yacht & Beach	Asbury Lobby	I
Committee & Business Meetings					
Audit Committee	3/18/2015	7:30 a.m. to 8:00 a.m.	Yacht & Beach	Stonington	R
Light Metals 2016 Subject Chairs Breakfast	3/18/2015	7:30 a.m. to 8:30 a.m.	Dolphin	Europe 1	R
TMS Board of Directors Meeting	3/18/2015	8:15 a.m. to 11:40 a.m.	Yacht & Beach	Cape Cod AB	I
TMS Annual Business Meeting	3/18/2015	8:25 a.m. to 8:30 a.m.	Yacht & Beach	Cape Cod AB	0
Graduate Student Advisory Council Recruitment Session	3/18/2015	9:00 a.m. to 10:00 a.m.	Dolphin	Europe 6	0
TMS Foundation Board of Trustees Meeting	3/18/2015	2:00 p.m. to 5:00 p.m.	Yacht & Beach	Cape Cod A	R
Programming Reception	3/18/2015	5:30 p.m. to 7:00 p.m.	Swan	Osprey 1	I
Thursday, M	arch 19	•			
All-Conference Events					
Registration	3/19/2015	7:00 a.m. to 12:00 p.m.	Dolphin	Atlantic Hall	0
Programming Support Desk	3/19/2015	7:00 a.m. to 5:00 p.m.	Dolphin	Atlantic Hall	0
Presenters' Coffee	3/19/2015	7:00 a.m. to 8:00 a.m.	Dolphin	Atlantic Hall	R
Technical Programming	3/19/2015	8:30 a.m. to 5:30 p.m.	See Technical	Program section	0
Morning Break	3/19/2015	9:50 a.m. to 10:30 a.m.	loca	tions	0
Afternoon Break	3/19/2015	3:20 p.m. to 4:00 p.m.	Yacht 8	& Beach	0
Special Presentations					
Engineering Solutions for Sustainability Poster Tear-down	3/19/2015	8:00 a.m. to 10:30 a.m.	Yacht & Beach	Asbury Lobby	0
Engineering Solutions for Sustainability Plenary II	3/19/2015	8:30 a.m. to 10:00 a.m.	Yacht & Beach	Asbury ABC	0
Social Functions					
Faces of the TMS Foundation	3/19/2015	7:00 a.m. to 12:00 p.m.	Dolphin	Convention Registration Foyer	0
Connect Zone	3/19/2015	8:30 a.m. to 12:00 p.m.	Dolphin	Atlantic Hall	0
Repeat Attendee Luncheon	3/19/2015	11:30 a.m. to 1:30 p.m.	Yacht & Beach	Cape Cod ABC	I

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Want to Get Involved?

Attend one of the many open technical committee meetings being held this week to meet colleagues with similar interests and become a contributing member of the TMS community.

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MAPS AND FLOORPLANS

Dolphin Convention Hall Space



Dolphin Lobby Level







MEETING INFORMATION

Dolphin Hemispheres Ballroom



Swan Ballroom











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WILL YOUR FAVORITE WIN?

Make sure by casting your vote by March 20, 2015.

TMS2015 attendees can vote using the convenient mobile form at www.tms.org/vote



The nominees for the Top Ten Greatest Works of Materials Fiction are:















Atlas Shrugged: Avn Rand

Cat's Cradle: Contact Kurt Vonneaut Carl Sagan

The Cross-Time Engineer Leo Frankowski

The Dark Knight Days of Future Returns Past Frank Miller Chris Claremont and John Byrne

The Diamond Age: Neal Stephenson

Dragon's Egg/ Starquake Robert L. Forward

VILLIAM AKESPEARE

The Merchant

Venice[.]

William

Foundation (trilogy): Isaac Asimov



Game of Thrones (Song of Ice and Fire series): George R.R. Martin





Lord of the Rings (trilogy): J.R.R. Tolkien

I.R.I

FOLKIEN



Mars (trilogy): Kim Stanley Robinson

Mysterious Island: Merchant of Jules Verne



No Highway: Nevil Shute

Homer



"Profession": Isaac Asimov Dirk Cussler



River God: Wilbur Smith



Sublimation: Sinclair, Wonder W.M. Goldberger Rear Malorie Blackman

The Vanished the South: Jules Verne

Diamond: Star of

For details on each nominee, including the materials connection that makes it worthy for this list, visit the JOM Materials Fiction Countdown website at www.tms.org/JOMCountdown.



Place your bid Tuesday from 4:00 p.m. to 9:00 p.m. in the Yacht and Beach Grand Harbor Lobby.

The books will be on display all week near the Faces of the Foundation booth. **OWN THE COMPLETE LIBRARY** MATERIALS FICTION COUNTDOWN





Light Metals Keynote:

Latest Developments in

Smelting of Light Metals

Monday, March 16 • 8:30 a.m. to Noon Southern Hemisphere Ballroom I, Dolphin Hotel

Three smelting processes dominate the production of light metals: the Hall-Heroult cell for aluminum, the Kroll process for titanium, and the Pidgeon process for magnesium. This symposium will review the status of the latest programs and developments in potential alternative processes and share these developments across the research community of all three light metals.

This keynote, which will include a panel session, will look to explore synergies among the three light metals, such as co-production and common problems and approaches for all three metals. The intent is to break down silos between research groups and explore cross-fertilization opportunities.

The program organizer is John Grandfield, Grandfield Technology Pty Ltd., Australia.

Presentations and Speakers

"An Overview of Alternate Smelting Processes for Light Metals"

James Metson, University of Auckland and Ministry of Business Innovation and Employment, New Zealand

"The Advanced Research Projects Agency-Energy (ARPA-E) Light Metal Production Technology Programs"

James Klausner, University of Florida and U.S. Department of Energy ARPA-E, USA

"Emerging Titanium Production Processes" **Kathie McGregor,** Commonwealth Scientific and Industrial Research Organisation (CSIRO) Process Science and Engineering, Australia

"An Overview of Thermochemical Processes for Low Cost Production of Ti: Challenges and Opportunities" **Zak Fang,** University of Utah, USA "Carbothermic Reduction of ZnO, MgO, SiO2, and Al2O3 Using Concentrated Solar Energy" **Aldo Steinfeld,** ETH Zurich and Paul Scherrer Institute, Switzerland

"Carbothermal Production of Aluminum and Magnesium" Mark Cooksey, CSIRO, Australia

"Balzano and Magnetherm Alternate Variants of Silicothermic Reduction of Magnesium to Pidgeon Process"

James Sever, Alpha/Omega Engineering and Nevada Clean Magnesium Inc., USA

"Olivine as a Feedstock for Magnesium Electrolysis: The SilMag Project"

Per Bjørn Engseth, SilMag Production As, Norway

"Towards Environment-Friendly Minerals Processing: A New Path for Alumina Production with CO2 Utilization"

Asuncion Aranda, Institute for Energy Technology-IFE, Norway



Magnesium Technology 2015

Keynote Session

Monday, March 16 • 8:30 a.m. to Noon Northern Hemisphere E1, Dolphin Hotel

This year, the Magnesium Technology Symposium will open with a special keynote session, featuring four invited presentations:

"Reducing Weight for Transportation Applications: Technology Challenges and Opportunities" **Alan Taub,** American Lightweight Materials Manufacturing Innovation Institute and University of Michigan, USA

"The Application of Magnesium Alloys in Aircraft Interiors—Changing the Rules" **Bruce Davis,** Magnesium Elektron North America, USA "Emerging Science and Research Opportunities for Metals and Metallic Nanostructures: A Report on the NSF MMN Workshop" **Tresa Pollock,** University of California, Santa Barbara, USA

"Solute Segregation and Aggregation in Mg Alloys" Jian-Feng Nie, Monash University, Australia

MS SAVE THE DATES!

Mark your calendars now for these upcoming annual meetings with TMS:

TMS Annual Meeting & Exhibition

2016	Nashville, Tennessee	February 14-18	Music City Center
2017	San Diego, California	February 26-March 2	San Diego Convention Center
2018	Phoenix, Arizona	March 11-15	Phoenix Convention Center
2019	San Antonio, Texas	March 10-14	Henry B. Gonzalez Convention Center
2020	San Diego, California	February 23-27	San Diego Convention Center
2021	Orlando, Florida	March 7-11	Marriott World Center

Materials Science & Technology (MS&T)

2015 Columbus, Ohio	October 4-8	Greater Columbus Convention Center
2016 Salt Lake City, Utah	October 24-27	Salt Palace Convention Center

Engineering Solutions for Sustainability: Materials and Resources (ESS: M&R II)

A Special Symposium Planned as Part of the TMS 2015 Annual Meeting & Exhibition



Funding support for ESS:M&R II was generously provided by the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME).

With impending and burgeoning societal issues affecting both developed and emerging nations, the global engineering community has a responsibility and an opportunity to truly make a difference and contribute. This symposium will focus on what materials and resources are integral to meeting basic societal sustainability needs in critical areas of energy, transportation, housing, and recycling. The first Engineering Solutions for Sustainability: Materials & Resources symposium was held July 22-24, 2009 in Lausanne, Switzerland. All sessions for this special symposium, including the plenary sessions, will be held at the Yacht & Beach Convention Center.

ESS: M&R II Wednesday Plenary

Wednesday, March 18, 8:30 a.m. to 10:10 a.m. Grand Harbor North Ballroom, Yacht & Beach Convention Center

"Global Materials Resource Challenges (Opportunities) for the 21st Century" **Diran Apelian,** Worcester Polytechnic Institute, USA

"Sustainability using Biotechnology for the Chemical Industries" June Wispelwey, American Institute of Chemical Engineers, USA

"Sustainability: A Business Imperative, Not a Moral Sacrifice" **Behrooz Fattahi,** Society of Petroleum Engineers, USA

ESS: M&R II Thursday Plenary

Thursday, March 19, 8:30 a.m. to 10:10 a.m. Grand Harbor North Ballroom, Yacht & Beach Convention Center

"A Healthy Home is a Fractal Home" **Matthew Grocoff,** THRIVE Net Zero Energy Collaborative, USA

"Sustainable Development Practices in the Minerals Industry" Jessica Elzea Kogel, Imerys, France

"Sustainable Policy from Washington and the States: A Role For the Engineer" **Mark Burtschi,** ArcelorMittal, USA



Acta Materialia Symposium: Honoring 2015 Award Recipients Tresa Pollock and David Embury

Wednesday, March 18 • 3:00 p.m. to 4:30 p.m. Asia 5, Dolphin Hotel

2015 Acta Materialia Award recipients Tresa M. Pollock and David Embury will deliver invited presentations at this special symposium celebrating their achievements. Following the session, attendees are invited to a special reception.

"Design of New Co-base Alloy Single Crystals: The Impact of an MGI Approach"



Tresa Pollock, University of California Santa Barbara, USA

The existence of the ordered L12 Co3(AI,X) phase in ternary and quaternary systems provides a pathway for the design of a new class of high-temperature structural

alloys. However, rapid design and development of these new materials is challenged by several major factors: (1) the overwhelmingly large compositional search space for thermodynamically stable L12, (2) the lack of tools to predict the evolution of microstructure, starting from the liquid state, (3) an incomplete set of experimental and computational capabilities for rapid assessment of thermal, physical, and mechanical properties, and (4) the needs and constraints for associated hightemperature coatings. The complementary role of an MGI approach, with new experiments, abinitio models, thermodynamic assessments, and mechanical property models employed for design of new Co-base single crystals alloys systems will be discussed. Single crystal compositions with creep properties equivalent to current Ni-base single crystal are presented. Needs and opportunities for further acceleration of the design process will be discussed.

"Exploring Controlled Heterogeneity as a Strengthening Mechanism"



David Embury, McMaster University, Canada

The approach to developing high-strength structural materials has, in large part, centered on homogenizing the microstructure by removing defects and inclusions

and exploiting the refinement of the scale of the microstructure. This often has the disadvantage of attaining high strength but with limited work hardening capacity or ductility. An alternative is to develop a variety of heterogeneous structures which permit events to occur sequentially or in a spatially distributed manner in the structure. A number of these forms of controlled heterogeneity will be explored in the brief talk.



At the TMS 2015 Annual Meeting & Exhibition, three technical symposia will be held in honor of leaders in the minerals, metals, and materials community, and a fourth will be held in memory of Nagy El-Kaddah. The following symposia are planned:

Advances in the Science and Engineering of Casting Solidification*

A Materials Processing & Manufacturing Division Symposium Honoring Doru Michael Stefanescu

Dates: Monday, March 16 to Thursday, March 19 **Location:** Swan 6, Swan Hotel



This symposium encompasses the following areas: solidification processing, solidification modeling, novel casting and molding processes, cast iron, and nanomanufacturing of materials.

Constitutive Response and Modeling of Structural Materials

A Structural Materials Division Symposium in Honor of G.T. Gray III's 60th Birthday

Dates: Monday, March 16 to Wednesday, March 18 **Location:** Asia 2, Dolphin Hotel



This six-session symposium will provide a forum for the discussion of recent investigations concerning structure/property relations within structural materials. Recent developments of mechanical test techniques, microstructural characterization, and strength and damage modeling will be the focus.

Micromechanics of Structurally Inhomogeneous Materials

A Functional Materials Division Symposium in Honor of Armen Khachaturyan Dates: Monday, March 16 to Wednesday, March 18 Location: Asia 3, Dolphin Hotel



This symposium will discuss the current status and recent advances in research areas in which Armen Khachaturyan has made seminal contributions, including theory of phase transformations in metal and ceramic systems; thermodynamics and kinetics of alloy phase decomposition and ordering, martensitic

and ferroelastic transformations, and domain structure evolution in ferrorelectrics and ferromagnetics; and micromechanics of structurally inhomogeneous materials.

MHD 2015*

Nagy El-Kaddah Memorial Symposium on Magnetohydrodynamics (MHD) in Materials Processing

Dates: Monday, March 16 to Wednesday, March 18 **Location:** Swan 2, Swan Hotel



This symposium will provide a forum where university and academic professionals can interact with other stakeholders to facilitate the advancement of MHD in industry. Themes include experimental MHD, mathematical modeling of MHD, MHD stability, industrial ap-

plications of MHD, and recent applications of MHD.

* Dinners will be held in conjunction with the El-Kaddah and Stefanescu symposia; tickets for these events may be purchased until 10:00 a.m. on Monday, March 16.



to create a personalized schedule of meeting events. Now available on the App Store and the Google Play™ Store. Just search for "TMS Annual Meeting."



ANDROID APP ON

SPECIAL LECTURES



MONDAY, MARCH 16

2015 William Hume-Rothery Award Lecture

Date: Monday, March 16 • 8:30 a.m. to 9:00 a.m. **Location:** Oceanic 1, Dolphin Hotel



Speaker: William Boettinger, National Institute of Standards and Technology (NIST) Lecture Title: "Solidification of Multicomponent Alloys" About the Topic: Various topics

taken from the speaker's lifetime research portfolio that involve

multicomponent alloy solidification will be reviewed. Topics include: ternary monovariant and invariant eutectics, solder microstructure and wetting, quasicrystal AlCuFe phase diagram, solidification path analysis, Ni metal hydride electrode solidification, freckle formation in superalloys, DTA simulation during melting and freezing, and metallic glass formation.

Extraction & Processing Division Distinguished Lecturer

Date: Monday, March 16 • 8:30 a.m. to 9:20 a.m. **Location:** Grand Harbor Ballroom Salon 2, Yacht & Beach Convention Center



Speaker: Uday B. Pal, Boston University

Lecture Title: "Green Technology for Metals Production"

About the Topic: In the metal product value chain from mined ores \rightarrow concentrates \rightarrow oxides \rightarrow metals \rightarrow alloys \rightarrow finished products, the

most energy-intensive step is usually the oxide to metal conversion. Today's industry generally uses carbon and large amounts of energy to reduce oxides to metals, resulting in significant pollution. This talk will describe an energy efficient and environmentally friendly metals production technology that utilizes oxygen-ion-conducting solid oxide membranes (SOM) to electrolyze metal oxides dissolved in a flux and directly produce the desired metal and pure oxygen gas as a value-added byproduct. The process has been successfully used to demonstrate production of technologically important metals from their respective oxides. These include light structural metals (aluminum and magnesium), solar-grade silicon, critical rare earth metals (dysprosium and ytterbium), and corrosion-resistant metals (titanium and tantalum). The electrochemical performance of the SOM cell for the production of several of these metals will be presented.

Structural Materials Division Luncheon Lecture*

Date: Monday, March 16 • Noon to 2:00 p.m. **Location:** Osprey 1, Swan Hotel



Speaker: David L. Bourell, University of Texas at Austin Lecture Title: "Additive Manufacturing: Origins, Applications and Future Possibilities"

About the Topic: The history and future will be presented for modern

additive manufacturing (AM). The technology, divided into seven categories by ASTM, dates to the 1980s, although precursor processes and AM "prehistory" date to the 1950s and the previous century, respectively. A rationale will be presented for the use of AM processes in lieu of conventional manufacturing processes. Two requirements for parts under consideration for AM are complex geometry and low production runs. Current sectors using AM illustrate the results. A survey of materials for AM will be provided. Some consideration will be presented respecting where AM technology is headed.

* This lecture is open to all meeting attendees, but only those who purchased tickets in advance will receive a catered lunch.

Help Build the Future Leaders of the Minerals, Metals, and Materials Community:

CONTRIBUTE TODAY!



www.TMSFoundation.org



TUESDAY, MARCH 17

Japan Institute of Metals (JIM) International Scholar

Date: Tuesday, March 17 • 11:40 a.m. to 12:10 p.m. **Location:** Swan Ballroom Salon 3, Swan Hotel



Speaker: Nobuo Nakada, Kyushu University **Lecture Title:** "Microstructural Characteristics of Austenite Formed from Lath Martensite via

Martensitic Reversion" About the Topic: When maraging steel is austenitized, the reversion

from martensite to austenite takes place via diffusionless shear mechanism (martensitic reversion). It is thought that the austenite formed by martensitic reversion (martensitically reversed austenite) contains high-density lattice defect. However, it is impossible to observe martensitically reversed austenite directory, because austenite is unstable at ambient temperature in maraging steel. In this study, we focused on a high austenite stabilization effect of carbon and an austenite stabilizing heat treatment consisting of three-step solid-solution annealing was applied to a 18%Ni-C steel. As a result, martensitically reversed austenite remained fully stable at room temperature through the unique heat treatment. After some microstructural characterizations, the following were mainly found. The martensitically reversed austenite has a fine lath structure with high dislocation density inherited from the lath martensite. While, the crystallographic texture of the austenite was the same as that of the original austenite before martensitic transformation.

TMIS Member Benefit #2

Discover new U.S. federal funding opportunities every week. Log in to *members.tms.org* for a regularly updated listing of funding sources related to minerals, metals, and materials.

EPD/MPMD Joint Luncheon Lecture*

Date: Tuesday, March 17 • Noon to 2:00 p.m. **Location:** Americas Seminar, Dolphin Hotel



Speaker: Edward J. McGowan, FLSmidth Lecture Title: "The 'Envelope of Protection' and the Value of 'Mature Safety Cultures'" About the Topic: The discussion will be directed toward mature

safety cultures and how today the envelope of protection involves all levels of management. Safety systems need to capitalize on the approach that multiple tiers are necessary to protect at-risk workers. The talk will focus on protection of the employees beginning with employee empowerment . . . and taking advantage of everything we can for the right purpose. Core to leadership is the understanding that it's not just about doing things right but doing the right things. The same theme is core to accident prevention.

* This lecture is open to all meeting attendees, but only those who purchased tickets in advance will receive a catered lunch.

Young Professional Tutorial Luncheon Lecture*

Date: Tuesday, March 17 • Noon to 2:00 p.m. **Location:** Northern Hemisphere D, Dolphin Hotel



Speaker: Antoine Allanore, Massachusetts Institute of Technology Lecture Title: "Teaching Sustainable Chemical Metallurgy in 2015"

About the Topic: The early 21st century is experiencing a

formidable challenge related to materials extraction and processing. Those core industrial activities will have to ultimately provide more than nine billion inhabitants with commodities such as steel or fertilizer at an unprecedented rate, while mitigating environmental or societal impacts. In that perspective, higher education institutions have the mission to prepare students to shape the technological paradigms for such challenges, and Allanore argues that it all starts with the fundamentals of materials

SPECIAL LECTURES



extraction, metals in particular. Allanore will present his recent endeavor in teaching the fundamentals of chemical metallurgy to undergraduate students at the Massachusetts Institute of Technology, prior to opening a discussion on the possible future of such classes in connection with online education.



Speaker: Peter Hosemann, University of California Lecture Title: "Material Science: A Field Present in Everyday Life and a Unifying Discipline, but Often Not on Students' Radar"

About the Topic: Wondering how a young person—a freshly

graduated high school student—chooses his or her field of study in college, Hosemann always asks new students: "Why did you choose your field of interest? Why material science?" Common answers are that someone in the student's past mentioned it previously or works in a related field or that the student had a teacher or college advisor who guided them in making the selection of the field of study. But why and how would a student who is not exposed to a good engineering background choose materials science, a field not widely accessible in pre-college education?

While physics and chemistry are often featured on public platforms, such as newspapers or TV, and engineering is in every student's life through the use of engineered items, such as phones and cars, material science utilizing physics and chemistry to enable engineering solutions is often not on a student's mind when choosing scientific disciplines or career paths. While this topic is of immediate interest to academics, it bridges further towards a general public perception of what is needed in everyday life to make devices work. In this talk, the question above will be discussed by asking "What do material scientists do?" in a nonprofessional fashion in order to give thought for outreach activities.

* These lectures are open to all meeting attendees, but only those who purchased lunches in advance will receive a boxed lunch.



Institute of Metals/Robert Franklin Mehl Award

Date: Tuesday, March 17 • 2:00 p.m. to 2:40 p.m. **Location:** Swan Ballroom Salon 4, Swan Hotel



Speaker: Subhash Mahajan, University of California, Davis **Lecture Title:** "The Role of Materials Science in Microelectronics: Past, Present, and Future"

About the Topic: Every leap in human civilization is associated

with a material—think of the stone-, bronze-, and steel-ages. Even though the current era is referred to as the information age, it would be apt to call it the Materials Age because materials have played a crucial role without which the information age may not have been feasible. To illustrate the role of materials science in microelectronics, we have chosen the following examples:

- Past Role: Zone refining; growth of bulk silicon crystals
- Present Role: Reduction of dislocations in III-V crystals; degradation behavior of light emitting devices
- Future Role: Integration of dissimilar materials: two step-step epitaxy of GaN (0001) sapphire; high-temperature electronics

TIMIS Member Benefit #3

Access Metallurgical and Materials Transactions, Journal of Electronic Materials, and more than 20 additional journals online by logging in to **members.tms.org**.





WEDNESDAY, MARCH 18

Light Metals Division Luncheon*

Date: Wednesday, March 18 • Noon to 2:00 p.m. **Location:** Southern Hemisphere Ballroom Salon 1, Dolphin Hotel



Speaker: Alan Taub, American Lightweight Materials Manufacturing Innovation Institute and University of Michigan Lecture Title: "The Role of the National Network of Manufacturing Institutes in Improving U.S. Manufacturing Competitiveness"

About the Topic: The U.S. government has launched a new National Network of Manufacturing Institutes designed to be a public-private partnership aimed at improving domestic manufacturing competitiveness. Four of these institutes have been awarded and several more are planned. Each institute is focused on a particular advanced manufacturing technology and will serve as the bridge between basic research and final product commercialization. The institutes are designed to link a network of universities and national/federal laboratories with companies in a targeted industrial sector. The companies range from small and medium enterprises to large suppliers and OEMs. This talk will describe how these institutes are operating using the American Lightweight Materials Manufacturing Innovation Institute (ALMMII) as an example. ALMMII is focused on the land, sea, and air transportation sectors, both commercial and defense. The mission is to provide technology solutions that will make the transport of people and goods more sustainable in terms of energy, the environment, safety, and affordability. Reducing weight is a key enabler for meeting these challenges as well as increasing payload and improving performance. In addition to developing new manufacturing processes, ALMMII is also working to develop a prepared and eager metals processing workforce.

* This lecture is open to all meeting attendees, but only those who purchased tickets in advance will receive a catered lunch.

TMS Member Benefit #4

Receive discounts from TMS's publishing partner, John Wiley & Sons, on publications, including textbooks and proceedings.







SUNDAY, MARCH 15



Date: Sunday, March 15 Elimination Rounds: Noon to 4:00 p.m. Championship Round: 6:30 p.m. to 7:00 p.m. Location: Grand Harbor Ballroom Salons 5-7, Yacht & Beach Convention Center Open to all attendees

Even if you aren't competing in this materials-themed quiz-show competition, you are welcome to attend the elimination rounds or the final championship round. Play along to test your knowledge of minerals, metals, and materials science and engineering or to cheer on your favorite school.

TMS 2015 Opening Celebration

Date: Sunday, March 15 Time: 5:00 p.m. to 6:30 p.m. Location: Grand Harbor Ballroom North, Yacht & **Beach Convention Center**

Open to all attendees

Kick off the TMS 2015 Annual Meeting & Exhibition with this social networking event. Refreshments will be provided.





Date: Sunday, March 15 Time: 7:00 p.m. to 9:00 p.m. Location: Grand Harbor Ballroom South, Yacht & **Beach Convention Center** Open to all attendees

Take a break and have some fun at this informal social event. Students will have the opportunity to interact with each other and with professionals in a relaxed setting. Refreshments will be provided.

MONDAY, MARCH 16

Women in Science Breakfast



Date: Monday, March 16 Time: 7:00 a.m. to 8:00 a.m. Location: Americas Seminar, Dolphin Hotel Tickets required

Organized by the TMS Women in Materials Science & Engineering Committee, this annual event offers an opportunity for TMS members to network and discuss issues specific to women in the science and engineering professions.

Connect Zone

Date: Monday, March 16 to Thursday, March 19 Time: 8:30 a.m. to 4:00 p.m.

Location: Atlantic Hall, Dolphin Hotel

The Connect Zone is open daily to all attendees as a gathering spot where meeting participants can connect both to the Internet-through free wireless access-and to other TMS2015 attendees. This open area will act as an informal networking center, workspace for attendees, and a convenient location to meet with colleagues. Connect Zone will be closed from 11:30 a.m. to 2:00 p.m. on Wednesday during the Student Send-off Lunch.

Access to the area will be reserved from 7:00 a.m. to 8:30 a.m. for Presenters' Coffee, but will open daily to all meeting attendees beginning at 8:30 a.m. and ending at 4:00 p.m.

TMS Member Benefit #5

Receive discounts on registration fees for select upcoming meetings sponsored by TMS.

Go to www.tms.org/Meetings to see a list of upcoming TMS events.



Meet the Editors of the Journal of Sustainable Metallurgy

Date: Monday, March 16 Time: 2:30 p.m. to 3:30 p.m. Location: Springer Booth, Atlantic Hall, Dolphin Hotel

Meet the editors of the *Journal of Sustainable Metallurgy*, a new quarterly journal from TMS and Springer Science+Business Media, and get your copy of the debut issue. The journal's distinguished international editorial team will be available to discuss the new publication:

Editors-in-Chief

- Diran Apelian, Worcester Polytechnic Institute, USA
- Bart Blanpain, KU Leuven, Belgium
- Shin-ya Kitamura, Tohoku University, Japan

Managing Editor

• Yiannis Pontikes, KU Leuven, Belgium

The journal is dedicated to presenting metallurgical processes and related research aimed at improving the sustainability of metal-producing industries, with a particular emphasis on materials recovery, reuse, and recycling.

Student Poster Contest Judging

Preliminary Judging: Monday, March 16 Best of Show Judging: Tuesday, March 17 Location: Atlantic Hall, Dolphin Hotel Browse the student poster displays and ask questions of the contest participants at the Student Poster Contest Judging Session.

President's Welcoming Reception

Date: Monday, March 16 Time: 5:00 p.m. to 6:30 p.m. Location: Pacific Hall, Dolphin Hotel All attendees are invited to meet in the exhibit hall for appetizers, beverages, and networking with exhibitors and other colleagues.

Meet-a-Mentor

Date: Monday, March 16 **Time:** 5:00 p.m. to 6:00 p.m.

Location: Northern Hemisphere D, Dolphin Hotel *For pre-registered participants only*

This event will provide early career professionals the opportunity to engage in brief face-to-face meetings with mentors in a structured setting. Following the Meet-a-Mentor event, attendees are invited to continue networking with their new contacts at the Young Professional Reception next door.

Young Professionals Happy Hour Reception

Date: Monday, March 16 Time: 6:00 p.m. to 7:00 p.m.

Location: Northern Hemisphere D, Dolphin Hotel This reception provides young professionals the opportunity to network with more experienced TMS members in a relaxed, social atmosphere.

Meet the Candidate Employment Poster Session

Date: Monday, March 16 Time: 6:30 p.m. to 8:30 p.m. Location: Atlantic Hall, Dolphin Hotel Open to all attendees

Organized by the TMS Young Leaders Committee, this session allows potential employers to connect with young professionals seeking post-doctoral, full-time, or faculty positions. Candidates present posters on their qualifications and research interests to potential employers from universities, industries, and national labs.



Information Center in the Exhibit Hall, or at the Springer Booth, Atlantic Hall, Dolphin Hotel.



TUESDAY, MARCH 17 TMS Bladesmithing Competition Judging

Date: Tuesday, March 17 Time: 1:30 p.m. Location: Pacific Hall, Dolphin Hotel

Join us in the Exhibit Hall at Booth #235 for the announcement of the TMS Bladesmithing Competition winners. More than 25 teams have submitted blades to the competition in two categories: University Students and Artisans and Enthusiasts. Visit the exhibit throughout the week to view the entries and see how they were made.

Student Career Forum

Date: Tuesday, March 17

Time: 2:30 p.m. to 4:30 p.m.

Location: Northern Hemisphere D, Dolphin Hotel Organized by the TMS Young Leader Committee, this session will feature speakers from various stages of their careers and diverse materials science backgrounds to discuss how to navigate a successful career path in minerals, metals, and materials.

Exhibit Hall Happy Hour

Date: Tuesday, March 17 **Time:** 4:30 p.m. to 5:30 p.m. **Location:** Pacific Hall, Dolphin Hotel All attendees are invited to gather in the exhibit hall for appetizers, beverages, and networking with exhibitors and other colleagues.

TMS Foundation Silent Auction

Date: Tuesday, March 17 **Time:** 4:00 p.m. to 9:00 p.m.

Location: Grand Harbor Lobby, Yacht & Beach Convention Center

Bid on a variety of prizes, ranging from high-quality gifts procured by professional auctioneers to one-ofa-kind items crafted by your minerals, metals, and materials colleagues at the TMS Foundation Silent Auction. All meeting attendees are welcome to participate in the auction, and proceeds will benefit the TMS Foundation, which provides scholarships and career development opportunities for students and young professionals in the minerals, metals, and materials community. Because the event is a silent auction, bids will be placed in writing over the course of the evening.

WEDNESDAY, MARCH 18

Student Send-off Lunch

Date: Wednesday, March 18 Time: Noon to 1:00 p.m. Location: Atlantic Hall, Dolphin Hotel For Undergraduate and Graduate Students Only As the meeting begins to wind down, take this opportunity to relax and swap stories with the friends that you've met over the course of the week. Lunch will be provided.

Events for Young Professionals TMS2015

TMS2015 will include a number of activities geared specifically toward young professionals, including:

- Technical Division Young Professional Poster Contest
- Meet the Candidate Employment Poster Session (Monday evening)
- Young Professional Happy Hour Reception (Monday evening)
- Young Professional Committee Meeting (Tuesday morning)
- Young Professional Tutorial Luncheon Lecture (Tuesday afternoon)

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March 17, 2015 Grand Harbor Ballroom, Yacht & Beach Convention Center

Schedule of Events:*

Reception: 5:30 p.m. to 6:30 p.m. Awards Ceremony: 6:30 p.m. to 7:45 p.m. Dinner: 7:45 p.m. Entertainment: 8:30 p.m.

*The reception and ceremony are open to all meeting attendees, but tickets are required for the dinner and entertainment portion of the evening.

Recognizing Excellence in Minerals, Metals, and Materials

The 2015 TMS & AIME Awards Ceremony and Banquet will be an elegant event, designed to honor the significant professional achievements of members of the minerals, metals, and materials community. The ceremony includes presentations of awards from TMS; the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME), of which TMS is a member society; and Acta Materialia, Inc.

The evening will consist of three parts. First, award recipients and their guests will be welcomed at a cocktail reception. Following the reception, participants will be seated for the awards ceremony, where individual recipients will be honored for their accomplishments. A photographer will be on hand to capture these moments. After the ceremony, those participants who have purchased banquet tickets will proceed to the adjacent ballroom for an elegant black-and-white themed dinner featuring live dinner music and a bit of magical entertainment. The evening will conclude with a live performance by a professional magician.

Entertainment

After dinner, banquet guests will be treated to entertainment from **John Ekin**, who specializes in *Comedy Magic for World-Class Events*. He'll offer a mix of magical effects and sophisticated humor for an evening of first-class entertainment.

Installation of the 2015 TMS President



Patrice E.A. Turchi

During the 2015 TMS & AIME Awards Banquet, TMS will install Patrice E.A. Turchi of Lawrence Livermore National Laboratory (LLNL) as the Society's 2015 president. Turchi is a distinguished member of the technical staff

and group leader in the Condensed Matter and Materials Division of the Physical and Life Sciences Directorate at LLNL. He received a Ph.D. (Thèse d Etat) in solid-state physics and a Ph.D. (Thèse de Docteur Ingénieur) in materials science from the University of Paris VI, France, after obtaining his Engineering Diploma from the National Superior School of Chemistry of Paris, also in France. He was a professor at the University Paris VI for 11 years, a visiting scientist at University of California, Berkeley for one year, and has been at LLNL for more than 28 years.

His research interests encompass computational materials science and condensed matter physics with an emphasis on alloy theory from firstprinciples electronic structure and stability and physical properties of complex assemblies. His current research activities focus on ab initio studies. thermodynamics, kinetics, and microstructure evolution of complex rare-earth- and actinidebased materials. Turchi has given more than 310 presentations, including 155 invited presentations, and authored or co-authored more than 275 publications, including 50 technical reports and three book chapters. He has also edited 21 technical books and proceedings.

TMS & AIME AWARDS CEREMONY AND BANQUET



Turchi has been an active member of TMS for more than 25 years and has served on the TMS board as chair of the Electronic, Magnetic & Photonic Materials Division (now the Functional Materials Division). He has also chaired the Allov Phases Committee and various administrative committees. In addition, Turchi has been a member of several TMS technical advisory groups and was a contributor to several recent TMS reports. He is co-founder of the International Alloy Conference and organizer of 15 TMS and three Materials Research Society (MRS) symposia, six international conferences, and two Advanced Study Institutes and one Advanced Research Workshop sponsored by NATO. He has received several professional honors and awards, and is on the review board of several scientific journals.

The 2015 TMS & AIME Awards Ceremony

The 2015 TMS & AIME Awards Ceremony will celebrate the many contributions that the minerals, metals, and materials professions have made to advancing society and improving quality of life. It's a meaningful way to congratulate those important to your career, while being inspired to strive for similar heights yourself.

The ceremony will be hosted by **James J. Robinson**, TMS executive director, and will include comments from **Hani Henein**, TMS 2014 president, and **Patrice Turchi**, TMS 2015 president. In addition, some of the Society's most esteemed members will act as presenters for the evening:

- Behrooz Fattahi, president of AIME, and Michele Lawrie-Munro, executive director of AIME, will present the AIME Awards.
- Brian Thomas, University of Illinois at Urbana-Champaign, will present the J.K. Brimacombe Prize.
- Carolyn Hansson, University of Waterloo, and George "Rusty" Gray, III, Los Alamos National Laboratory, will present the Acta Materialia Awards.
- Viola Acoff, University of Alabama, will present the Student and Mid-Career Awards.
- J. Wayne Jones, University of Michigan, will present the Elite Awards.
- Phillip Mackey, P.J. Mackey Technology Inc., will present the TMS Fellow Awards.

Society Awards

Fellow Award – Class of 2015

Iver Anderson Senior Metallurgist, Iowa State University

Surya Kalidindi Materials Science Professor, Georgia Institute of Technology

David Matlock Professor, Colorado School of Mines

Michael Mills Professor, Ohio State University

Christopher Schuh Professor and Department Head, Massachusetts Institute of Technology

Barry Welch Emeritus Professor, University of Auckland, and Director, Welbank Consulting Ltd.

Brimacombe Medalist – Class of 2015

Michael Brady Senior Research and Development Staff, Oak Ridge National Laboratory

W. Jud Ready Principal Research Engineer, Georgia Institute of Technology

> Michael Uchic Materials Research Engineer, Air Force Research Laboratory

Matthew Willard Associate Professor, Case Western Reserve University

Bruce Chalmers Award

Carl Koch Professor, North Carolina State University Cyril Stanley Smith Award

Michael Loretto Emeritus Professor of Materials, University of Birmingham

Early Career Faculty Fellow Award

Antoine Allanore Professor, Massachusetts Institute of Technology

Peter Hosemann Professor, University of California

Institute of Metals & Robert Franklin Mehl Award

Subhash Mahajan Distinguished Professor and Special Advisor to the Chancellor, University of California

Educator Award

Guenter Gottstein Director of Institute, RWTH Aachen

Leadership Award

Yuntian Zhu Distinguished Professor, North Carolina State University

William Hume-Rothery Award

William Boettinger Metallurgist-NIST Fellow, National Institue of Standards & Technology (NIST)

Morris Cohen Award

Marc André Meyers Professor, University of California

Ellen Swallow Richards Diversity Award

Julia Weertman Walter P. Murphy Professor Emerita of Materials Science and Engineering, Northwestern University



TMS & AIME AWARDS CEREMONY AND BANQUET

AIME Awards

AIME Honorary Membership

Thaddeus Massalski Professor Emeritus, Carnegie Mellon University

AIME Champion H. Mathewson Award

Jian-Feng Nie Professor, Monash University

AIME Robert Lansing Hardy Award

Peter Hosemann Professor, University of California

AIME-EPD James Douglas Gold Medal

Uday B. Pal Professor, Boston University

AIME Presidential Citation

Brajendra Mishra Professor, Colorado School of Mines

AIME Henry deWitt Smith Scholarship

Alexandra Anderson Student, Colorado School of Mines

Mohsen Seifi Student, Case Western Reserve University

Additional Awards

Acta Materialia Gold Medal Award

David Embury Professor, McMaster University

Acta Materialia Hollomon Materials & Society Award

Tresa Pollock Alcoa Professor of Materials, University of California Brimacombe Prize

Michel Rappaz Professor, École Polytechnique Fédérale de Lausanne

Division Awards

EXTRACTION & PROCESSING DIVISION (EPD)

Distinguished Lecturer Award

Uday B. Pal Professor, Boston University Distinguished Service Award

Adrian Deneys Business Development Manager, Praxair Inc.

Science Award

Tai Xi Zhu Ph.D. Candidate, McMaster University

Kenneth S. Coley Professor and Associate Dean, McMaster University

Gordon A. Irons Dofasco Professor, McMaster University

> Matthew Peter King ArcelorMittal Dofasco

> Technology Award

Katsutoshi Inoue Professor, Saga University

Shafiq Alam Associate Professor, University of Saskatchewan

Pyrometallurgy Best Paper Award

Lloyd Robert Nelson Head, Smelting and Refining Technology, Anglo American Platinum

FUNCTIONAL MATERIALS DIVISION (FMD)

Formerly Electronic, Magnetic & Photonic Materials Division

> Distinguished Service Award

Sungho Jin Professor of Materials Science, University of California

Distinguished Scientist/ Engineer Award

Kannan Krishnan Professor, University of Washington

John Bardeen Award

Chris Van de Walle Professor of Materials and Herbert Kroemer Endowed Chair in Materials Science, University of California

JEM Best Paper Award

MinSoo Park Senior Engineer, SK Hynix

Sean L. Gibbons Student, Naval Post-Graduate School

Raymundo Arroyave Assistant Professor, Texas A&M University

LIGHT METALS DIVISION (LMD)

Distinguished Service Award

Geoffrey Bearne General Manager, Rio Tinto

Technology Award

Jomar Thonstad Professor Emeritus, Norwegian University of Science and Technology

Light Metals Award

Jean-Marie Drezet Senior Scientist, École Polytechnique Fédérale de Lausanne

Pierre Celle

R&D Process Engineer, Constellium, Centre de Recherches de Voreppe (CRV)

> Olivier Ribaud Projects Manager, Constellium, CRV

Thilo Pirling Institut Laue Langevin

Light Metals Subject Award – Aluminum Reduction Technology

Lukas Dion Student, University of Quebec

> Laszlo Kiss University of Quebec

Dany Lavoie Technical Superintendent-Reduction, Aluminerie Alouette Inc.

Jean-Paul Arvisais Process Chemist, Aluminerie Alouette, Inc.

Light Metals Subject Award – Electrode Technology for Aluminum Production

Rebecca Jayne Thorne Norwegian University of Science and Technology

Camilla Sommerseth Ph.D. Fellow, Norwegian University of Science and Technology

Ann Mari Svensson Norwegian University of Science and Technology

Espen Sandnes Hydro Aluminium a.s. Ardal

Lorentz Petter Lossius Principal Engineer, Hydro Aluminium a.s. Ardal

Hogne Linga Manager Carbon R&D, Hydro Aluminium a.s. Ardal

> Arne Petter Ratvik Senior Scientist, Sintef
TMS & AIME AWARDS CEREMONY AND BANQUET



Light Metals Subject Award – Aluminum Alloys

Werner Fragner Head of Corporate Technology, Austria Metall GmbH

Helmut Suppan Managing Director, AMAG Casting GmbH

> Marc Hummel Audi AG

Dominik Bosch Friedrich-Alexander-Universität Erlangen-Nürnberg

Peter Uggowitzer ETH Zurich

Light Metals Subject Award – Warren Peterson Cast Shop for Aluminum Production (See overall Light Metals Award)

Light Metals Subject Award – Recycling

Amund Nordli Lovik Student, Norwegian University of Science and Technology

Daniel B. Müller Norwegian University of Science and Technology

Energy Best Paper Award – Professional

Ting-an Zhang Northeastern University

Hongliang Zaho Northeastern University

Yan Liu Northeastern University

Zhihe Dou Northeastern University

Guozhi Lv Northeastern University

Qiuyue Zhao Northeastern University Yan Li Northeastern University

Energy Best Paper Award – Student

Yiling Zhang Student, Carnegie Mellon University

Paul A. Salvador Professor, Carnegie Mellon University

Gregory S. Rohrer Professor and Head, Department of Materials Science & Engineering, Carnegie Mellon University

Magnesium Technology Best Paper Award – Application

Felix Gensch TU Berlin, Extrusion R&D Center

René Nitschke TU Berlin, Extrusion R&D Center

Sven Gall TU Berlin, Extrusion R&D Center

Sören Müller TU Berlin, Extrusion R&D Center

Magnesium Technology Best Paper Award – Fundamental Research

Hyun Kyu Lim Principal Researcher, Korea Institute of Industrial Technology

Dae-Guen Kim Korea Institute of Industrial Technology

Tae-Yang Kwak Korea Institute of Industrial Technology

Hak Young Kim Korea Institute of Industrial Technology

Young-Ok Yoon Korea Institute of Industrial Technology **Shae K. Kim** Principal Researcher, Korea Institute of Industrial Technology

Wonseok Yang Korea Institute of Industrial Technology

Magnesium Technology Student Paper Award

Michael J. Nemcko Graduate Student, McMaster University

> Pauline Mas McMaster University

> Moisei Bruhis Research Engineer, McMaster University

David S. Wilkinson Dean and Faculty of Engineering, McMaster University

Magnesium Technology Best Poster

Christian Klose Vice President Biomedical Technology and Lightweight Construction, Leibniz Universität Hannover

Christian Demminger Researcher, Leibniz Universität Hannover

Hans Jürgen Maier Director, Leibniz Universität Hannover

JOM Best Paper Award

Thomas Eglinton Assets and Projects Manager, BP Castrol

Jim Hinkley Research Scientist, CSIRO Energy Technology

Andrew Beath Principal Research Engineer, CSIRO Energy Technology

> Mark Dell'Amico Consultant

MATERIALS PROCESSING & MANUFACTURING DIVISION (MPMD)

Distinguished Service Award

Katsuyo Thornton Associate Professor, University of Michigan

Distinguished Scientist/ Engineer Award

Xiaodong (Chris) Li Professor, University of Virginia

STRUCTURAL MATERIALS DIVISION (SMD)

Distinguished Service Award

Judy Schneider Professor, Mississippi State University

Distinguished Scientist/ Engineer Award

Michael Kassner Professor, University of Southern California

> JOM Best Paper Award

James E. Saal Materials Design Engineer, QuesTek Innovations LLC

Scott Kirklin Graduate Student, Northwestern University

Muratahan Aykol Student, Northwestern University

Bryce Meredig Student, Stanford University

Christopher Wolverton Professor, Northwestern University 2015 TMS

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TMS & AIME AWARDS CEREMONY AND BANQUET

Young Leader Awards

TMS/JIM Young Leaders International Scholar

Quizhen Li Associate Professor, Washington State University

JIM Young Leaders International Scholar

Nobuo Nakada Assistant Professor, Kyushu University

FEMS/TMS Young Leaders International Scholar

Kyle Brinkman Associate Professor, Clemson University

EPD Young Leaders Professional Development Awards

Xioafei Guan Postdoctoral Research Associate, Boston University

John Howarter Assistant Professor, Purdue University

Guillame Lambotte Postdoctoral Associate, University of Massachusetts

Li Li Postdoctoral Associate, Cornell University

Takanari Ouchi Senior Postdoctoral Associate, Massachusetts Institute of Technology

Mingming Zhang Research Engineer, ArcelorMittal Global R&D

FMD Young Leaders Professional Development Awards

Ritesh Sachan Postdoctoral Research Associate, Oak Ridge National Laboratory Ziqi Sun University of Wollongong

Hsin-Jay Wu National Sun Yat-Sen University

Wei Xiong Research Associate, Northwestern University

Jiahua Zhu Assistant Professor, University of Akron

Jingxi Zhu Assistant Professor, Sun Yat-Sen Univeristy-Carnegie Mellon University Joint Institute of Engineering LMD Young Leaders Professional Development Awards

Yashuang Gao Manager – China, University of Auckland Light Metals Research Centre

Ayesha Gonsalves Materials Scientist/Engineer, General Electric Global Research Center

Keegan Hammond Metallurgical Engineer, Aleris International Inc.

> Michael Powell Industrial Engineer, Southwire Company

Mesut Varlioglu Senior Materials Engineer, Hewlett-Packard

> Lei Zhang Assistant Professor, University of Alaska Fairbanks

MPMD Young Leaders Professional Development Awards

Mohsen Asle Zaeem Assistant Professor, Missouri University of Science and Technology

> Megan Cordill Scientist, Erich Schmid Institute

Eric Homer Assistant Professor, Brigham Young University

> Virendra Singh Materials Engineer, Schlumberger

Jason Trelewicz Assistant Professor, Stony Brook University

Caizhi Zhou Assistant Professor, Missouri University of Science and Technology

SMD Young Leaders Professional Development Awards

Xian-Ming (David) Bai Staff Scientist, Idaho National Laboratory

Allison Beese Assistant Professor, Pennsylvania State University

Avinash Dongare Assistant Professor, University of Connecticut

Michael Porter Assistant Professor, Clemson University

Ramprashad Prabhakaran Research Associate, Pacific Northwest National Laboratory

Timothy Rupert Assistant Professor, University of California

Student Awards

J. Keith Brimacombe Presidential Scholarship

> Thomas Chrobak Student, University of Wisconsin

EPD Scholarships

Jordan Dick Student, South Dakota School of Mines and Technology Allen Holmquist Student, South Dakota School of Mines and Technology

Molly Mentzer Student, University of Wisconsin—Madison

Sonja Postak Student, Massachusetts Institute of Technology

LMD Scholarships

Taylor Brown Student, University of Alabama at Birmingham

Douglas Fraser Student, University of Wisconsin—Madison

Aaron Kelley Student, University of Alabama at Birmingham

MPMD Scholarships

Alexandra Glover Student, Michigan Technological University

Alyx Kahn Student, Clemson University

SMD Scholarships

Shane Anderson Student, Michigan Technological University, Houghton

Steven Zeltmann Student, New York University, Brooklyn

TMS Best Paper Contest - Graduate 1st Place

Brian Lin Student, Carnegie Mellon University

TMS Best Paper Contest - Graduate 2nd Place

Cheng-Chieh Li Student, National Taiwan University

TMS

2014-2015 TMS VOLUNTEER LEADERSHIP

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New Resources for Your Bookshelf:

TMS2015

ANNUAL MEETING

PROCEEDINGS

Collected Proceedings

TMS 2015 Annual Meeting & Exhibition attendees in all registration classes receive free online access to the complete collected proceedings of the meeting—as a single PDF file including all published proceedings books, as separate PDF files for each proceedings publication, or as individual articles. Complimentary proceedings content must be downloaded before June 15, 2015, at which time standard pricing will take effect. Visit the TMS Information Center (Exhibit Booth #401) with any questions about accessing the collected proceedings.

Individual Print Volumes

Print editions of the following volumes are also available for purchase at the Wiley booth, located in the registration area in the Dolphin hotel.

- 6th International Symposium on High-Temperature Metallurgical Processing
- Advanced Composites for Aerospace, Marine, and Land Applications II
- Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu
- Characterization of Minerals, Metals, and Materials 2015
- Drying, Roasting, and Calcining of Minerals
- Energy Technology 2015: Carbon Dioxide Management and Other Technologies
- EPD Congress 2015
- Friction Stir Welding and Processing VIII
- Light Metals 2015
- Magnesium Technology 2015
- Rare Metal Technology 2015
- TMS 2015 Supplemental Proceedings

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TMS2015 FINAL PROGRAM





An integrated modeling tool for ICME practitioners to accelerate material design & development A tool for teaching/learning phase diagrams, thermodynamics, solidification and precipitation kinetics

PANDA

<u>PanPhaseDiagram</u> - A module for thermodynamic calculation of multi-component, multi-phase systems <u>PanPrecipitation</u> - A module for simulation of diffusioncontrolled precipitation kinetics of multi-component systems

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- Spinodal decomposition curve and contour curves
- Flexible table operations

- Concurrent nucleation, growth/dissolution, and coarsening
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 - Temporal evolution of volume fraction and composition of precipitate
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 - Multiple precipitates
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PanEngine API

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Place Your Bid Tuesday, March 17

4:00 p.m. to 9:00 p.m. Disney's Yacht & Beach Convention Center Grand Harbor Lobby

The TMS Foundation is sponsoring a silent auction open to all meeting attendees in conjunction with the 2015 TMS & AIME Awards Ceremony. Come to the auction and bid on a variety of items, ranging from high-quality gifts procured by professional auctioneers to one-of-a-kind items crafted by your minerals, metals, and materials colleagues. Bids will be placed in writing over the course of the evening.

Proceeds from the event will benefit the TMS Foundation, which provides scholarships and career development opportunities for students and young professionals in the minerals, metals, and materials community, so bid generously!



March 15-19, 2015 • Walt Disney World • Orlando, Florida, USA

29th

EXHIBITION

Exhibit Hours

Monday, March 16 4:00 p.m. to 6:30 p.m.

President's Welcoming Reception 5:00 p.m. to 6:30 p.m.

> **Tuesday, March 17** 10:00 a.m. to 5:30 p.m.

Exhibit Hall Happy Hour 4:30 p.m. to 5:30 p.m.

Wednesday, March 18 10:00 a.m. to 2:00 p.m.

Lunch 11:30 a.m. to 1:30 p.m.

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FLOOR PLAN OF EXHIBITING COMPANIES



2015 EXHIBIT DIRECTORY

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ABB Inc.

Booth #314 :

ABB Inc. Analytical Measurements-Measurement Products Group designs, manufactures, and markets high-performance analytical system solutions and spectroradiometers for petroleum, chemical, life sciences, academic, semiconductor, metallurgy, and remote sensing/aerospace markets. Building on more than 40 years of experience in analytical instrumentation, ABB has established itself as a worldwide leader in inclusion and hydrogen measurements in liquid aluminum. The company offers a complete range of analytical solutions to the aluminum industry: AISCAN™ hydrogen analyzer, LiMCA inclusion analyzer. Prefil®-Footprinter melt cleanliness analyzer, PoDFA inclusion identification, and quantification analysis. ABB also offers metallographic analysis service for its customers.

AdValue Technology LLC

Booth #333

A leading supplier in high-temperature ceramic products made of alumina, fused quartz, zirconia, and sapphire. Our products range from crucibles, furnace tubes, plates and discs, thermocouple insulators, sample pans for thermal analysis, and UV cuvettes to custom components. We also carry other labware and accessories such as agate mortars, crucibles tongs, and high-temperature gloves.

Advanced Dynamics Corp. Ltd.

Booth #215

For over almost five decades, Advanced Dynamics (ADCL) has supplied our global customer base with stateof-the-art material handling systems for carbon plants and cast houses. Our handling technology includes fully automated or semi-automated equipment for aluminum and primary metals sectors. ADCL is a one-stop shop for your material handling needs including mechanical and controls engineering, fabrication, assembly, test, and commissioning. Whether you need a new system or upgrades to existing systems or simply individual pieces of equipment, we can help improve your company's productivity. Remember "When it's critical to your operations, it's an Advanced Dynamics mission" when you think of ADCL for your next project.

Agilent Technologies

Booth #227

Agilent manufactures and distributes a complete line of instrumentation serving the clinical, analytical, biotech, environmental, pharmaceutical, forensic science, food and flavor, academia, and all other laboratory markets that have needs for the best in quality, performance, and serviceability in the instruments they purchase.

ALTEK, LLC

Booth #224

ALTEK is a technology-based company with specialist expertise and experience in the design, manufacture, and installation of aluminium dross and scrap processing systems. Our engineers have, between them, over 200 years of international experience in developing and refining solutions to dross and scrap recycling. They are a unique skill resource for our worldwide customers. ALTEK's engineers use advanced 3D design/modelling software to design, manufacture, and install: Dross press and cooling equipment (including TARDIS Dross Press and Cooling technology); electromagnetic 'air cooled' stirring systems for all types and shapes of furnaces; specialized RHINO cast steel containers for handling aluminium drosses and salt cake; Tilt Type Rotary Furnaces - TTRF®; and furnace tending machines (under license with Tomorrow Technology).

Aluminium International Today

Booth #434

Aluminium International Today is the aluminium industry's leading international publication reporting on aluminium production and processing worldwide. Founded in 1989, the journal has consistently provided a wealth of technical features aimed at equipping producers and processors with information on latest developments. Added to this is a regular digest of industry news, contracts, events, new technology, product reviews, and conference reports. Supported by the Aluminium Federation in the UK, Aluminium International Today publishes six times a year in English plus two Chinese issues and two Russian issues. Aluminium International Today is a subscription magazine. For additional information, visit www.aluminiumtoday.com. Contact: Aluminium International Today, Quartz Business Media, Quartz House, 20 Clarendon Road, Redhill, Surrey RH1 1QX, UK; Tel +44 (0)1737 855000; Fax +44 (0)1737 855034; e-mail aluminium@guartzltd.com.

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Booth #439

AluminiumNetwork.com

Booth #416

AluminiumNetwork.com is the global network for the primary aluminium industry. An internet-based portal offering a wide range of daily information and services to companies and individuals engaged in the primary aluminium industry, our services include all engineering disciplines from the alumina through to the primary aluminium, including all the support functions for the processes involved. An important feature of AluminiumNetwork.com is its database of consultants and freelance specialists with experience in the aluminium industry. In addition to providing general consultancy services, the experts can offer their support in a large number of areas including feasibility studies, recommendations for revamps, overhauls and repairs, spare parts, purchasing, technical evaluation, research, advice on compositions and formulations, global supplier evaluation and auditing, process evaluation and optimization. The support can be on a freelance basis and for as long as it is needed.

American Welding Society

The American Welding Society (AWS) was founded in 1919 as a multifaceted, nonprofit organization with a goal to advance the science, technology and application of welding and related joining disciplines. From factory floor to high-rise construction, from military weaponry to home products, AWS continues to lead the way in supporting welding education and technology development. The American Welding Society's activities include standard development, personal certification. trade show management, magazine and book publishing, and educational events. The Society also focuses on allied joining and cutting processes, including brazing, soldering and thermal spraying.



Drawing on more than 100 years of Bayer process development, design and operating experience, our proven technology solutions are supported by a unique set of training, commissioning and support services. For inquiries: antonio.pucci@riotinto.com

Rio Tinto Alcan Yarwun Alumina Refinery — Queensland, Australia High Temperature Digestion, Commissioned in 2004 and expanded in 2012

RioTintoAlcan

2015 EXHIBIT DIRECTORY



ANDRITZ METALS Inc.

Booth #226

ANDRITZ METALS Inc.-leader in engineering and design. ANDRITZ METALS Inc. specializes in furnaces for the steel, aluminum, and precious metals industry. The USA company engineers, supplies and installs a wide variety of furnaces for melting, heating, reheating and heat treating. Our furnaces meet the stringent requirements for a wide variety of batch and continuous operations. Since its founding in 1966 ANDRITZ METALS Inc. has provided complete solutions meeting or exceeding its clients' needs. From initial engineering studies and analyses through project management, construction and commissioning to training the operators, ANDRITZ METALS Inc. covers all aspects of designing and building many types of industrial furnace equipment. The ANDRITZ METALS Inc. vision emphasizes guality as the cornerstone of creating value, benefiting customers and employees. As a member of the Andritz Group, ANDRITZ METALS Inc. complements the group's portfolio within the Metals strategic business area.

Anton Paar USA

Booth #232

TriTec, formerly CSM Instruments and now part of Anton Paar, offers a wide range of instruments and testing services for surface mechanical properties characterization, including: Hardness Testers, Scratch Testers & Tribometers. 3D-imaging options are available with the ConScan or AFM objective. CSM manufactures standalone instruments and testing modules that can be combined together on an automated platform.

ATR National Scientific User Facility

AUMUND Foerdertechnik GmbH

Booth #421

Booth #329

With their proven track record in materials handling and storage from mineral processing to hot materials handling, the AUMUND Group offers engineered and cost effective solutions for the primary aluminium production process. Controlled cooling and clean handling of bath material in the primary aluminium smelting process with the AUMUND cooling conveyor for hot bath material offers the following benefits: economical and efficient handling, defined cooling from 850°C down to below 100°C, drastic reduction of HF emission through controlled suction, improved environmental and health conditions, and reduced investment and operating costs.

Beijing Holland Trading Co., Ltd. Booth #536

Beijing Holland Co., Ltd. is a technology and trading company engaged in the production and exportation of Chinese production line for the cable and wire industry as well as the electrical equipment industry. We have set up two overseas sales and service offices in India and Brazil. With high-quality service and performance, we win the trust of our customers in the global market.

Bloom Engineering Company, Inc. Booth #317

Bloom Engineering is the leading supplier of high temperature industrial burners and associated combustion equipment. The company has extensive experience in the steel, aluminum, and forge industries and also provides combustion equipment for many other applications. The company prides itself on its in-depth knowledge of the applications in which its equipment is used and the custom designs it creates to provide the best possible solution for each situation. A truly global business, Bloom has companies and associates in all of the major industrial centers of the world. Its headquarters are in Pittsburgh where it was founded in 1934.

Bose Corporation

Booth #331

Bose® has solutions for the most challenging materials testing applications. Bose test systems offer capabilities that include dynamic mechanical/thermal analysis, fatigue, creep and stress-relaxation testing. All these capabilities can be provided in a single, all-electric, maintenance-free system. Multi-sample and multi-axis test systems, such as axial-torsion and planar biaxial, are also available. Bring us your materials testing challenges and experience the Bose Above & Beyond[™] support!

Bruker AXS Inc.

Booth #323

Bruker offers high end solutions for the analysis or comprehensive phase quantification of raw materials, minerals and raw earth. Offering advanced solutions to reliably support geologists and prospectors on locating and analyzing deposits. Bruker's instruments can be found at an altitude of 4,000 meters or in deserts. Also, Bruker's analytical solutions enable the development, production and refinement of metals at highest quality standards.

Buss ChemTech

Booth #431

BUSS ChemTech AG (BCT) is a world leading technology provider for the production of carbon anodes used in aluminum electrolysis. The BCT Paste Kneader became the industry's benchmark at its inception 60 years ago and continues to be the defining standard today. We are offering quality engineering and equipment, and a scope of supply to fit all needs—from basic engineering and key equipment packages to turnkey Green Anode Plants. We also provide upgrades for existing anode facilities. BCT is a member of KRESTA industries. KRESTA industries is an industrial group with its own fabrication facilities associated with full EPC project execution capabilities.

California Nanotechnologies

Booth # 230

California Nanotechnologies is a world leader in production and R&D of nano-structured components and materials. Metallic, ceramic, MMC, and MMNC materials are used in products from aerospace to sports and recreation industries. Through the incorporation of nano-sized structures and reinforcements, these materials exhibit improved properties that include ultimate strength, hardness, fracture toughness, wear resistance and chemical resistance. To provide these products, the company has an array of production facilities including cold forging, cryogenic milling, controlled atmosphere handling, high vacuum/high temperature degassing, state of the art furnaces and laboratory facilities including a scanning electron microscope and ion beam milling.

Carl Zeiss X-ray Microscopy, Inc.

Booth #415

ZEISS acquired Xradia to offer 3D X-ray microscopes, introducing two new non-destructive 3D imaging systems for synchrotron-quality lab-based research. Xradia 520 Versa offers submicron imaging with unique dualenergy based compositional contrast capability. Xradia 810 Ultra provides <50 nm spatial resolution up to 10X faster for a wide variety of materials. With unique optics and architecture that enable high resolution over large working distances along with the non-destructive nature of X-ray, these systems are ideal for in situ, 4D research and correlative microscopy. These capabilities reveal the

details of microstructural evolution from mm to nm to quantify, characterize, and visualize the properties and behaviors of a wide variety of materials.

COMPANY DESCRIPTIONS

Booth #212

Booth #327

CIMM can service for design, equipment & materials supply in global industrial areas. To strengthen our professional service ability, we set up a platform "Ark of China" with support from the Chinese Government, aiming to establish extensive economic-cooperation relationships on trade, investment & financing, technology transaction & information exchange, etc. The goal is to integrate the global resources and provide comprehensive service to global market.

Claudius Peters Projects GmbH

In the field of materials handling and processing, from stockyard, pneumatic conveying, silo, clinker cooler, grinding mill and packing & dispatch systems, Claudius Peters are experts in the cement, coal, alumina, gypsum, and bulk handling industries. Claudius Peters Projects GmbH, Germany, and Claudius Peters Technologies SAS France are part of the Technologies Division of Claudius Peters Group GmbH, headquartered in Buxtehude, near Hamburg, with regional offices in the Americas, Europe, China, and the Far East, offering turnkey and semi-turnkey systems. The group's other principal division, Aerospace, is engaged in the manufacture of aircraft parts for the European Airbus programme. Claudius Peters Group GmbH is a wholly owned subsidiary of Langley Holdings plc, a privately controlled UK engineering group.





CompuTherm LLC

Booth #324

CompuTherm LLC, established in 1996, develops CALPHAD type of modeling tools in the framework of ICME. The PANDAT 2014 version is released with three modules: PanPhaseDiagram for the calculation of multicomponent phase equilibria, PanPrecipitation for the simulation of diffusion-controlled precipitation processes, and PanOptimizer for the optimization of thermodynamic model parameters and other properties. Thermodynamic and mobility databases are available for variety of multicomponent alloys.

CRC Press/Taylor & Francis

Booth # 423

Take your research skills to the next level with Taylor & Francis Group/CRC Press, leading publisher of technical references and textbooks in Materials Science. Visit our booth for the latest and bestselling books in polymers, ceramics, metals, composites, biomaterials, electronic materials, and nanomaterials. Receive 15-25% off an authoritative range of titles and 50% on conference

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Crossroads Trade & Investment LLP Booth #301

Crossroads Trade & Investment LLP is a newly established independent British company active in raw material trading for metallurgical industries (ferrous & non-ferrous). We have the target to establish ourselves as a leading player in the Mediterranean, European, Middle Eastern, and north African rapid growing markets dealing in steam and metallurgical coal and petroleum coke with its both grades anode and fuel grades. We also maintain a strong interest in developing the Far East and Australian markets for some specialty carbon products. Crossroads has expanded its business potential through a network of representative offices and agents in several key locations around the globe. A team of specialized and highly experienced dedicated professionals and consultants are supporting the company with the best of their knowledge with up-to

ALTA 2015 23 - 30 May Perth, Australia Nickel-Cobalt-Copper, Uranium-REE and Gold-Precious Metals Conference & Exhibition

20th Anniversary Event

ALTA 2015 is the 20th anniversary of one of the world's leading annual metallurgical events. Organised by ALTA Metallurgical Services in cooperation with the International Atomic Energy Agency, the event is a gathering of the global Nickel, Cobalt, Copper, Uranium-REE and Gold-PM industries. ALTA Conferences are renowned for current, topical and high quality programs and 2015 will continue this 20-year track record. The final program typically includes 70+ papers.



date technical, financial & commercial developments as well as logistical and marketing trends worldwide.

EBSD Analytical

Booth #325

EBSD Analytical provides advanced materials characterization services usina EBSD/EDS/SEM techniques. We specialize in providing texture, grain size, ODF, grain boundary analysis, and phase ID including elemental composition. We also can provide strain analysis using Cross Court software and high resolution EBSD patterns. Our experts have over 18 years' experience in EBSD/EDS, and have analyzed many thousands of different sample types. We guarantee our results will exceed your expectations as we work with you to solve your materials problems.

EDAX Inc.

Booth #330

EDAX is a leading provider of innovative materials characterization systems encompassing Energy Dispersive Spectrometry (EDS), Wavelength Dispersive Spectrometry (WDS), Electron Backscatter Diffraction (EBSD) and Micro X-ray Fluorescence (XRF). The company designs, manufactures, distributes and services hardware and software solutions for a broad range of industries, educational institutions and research organizations.

Eirich Machines, Inc.

Booth # 221

Eirich Machines designs, manufactures, and supplies batch and continuous mixers and systems for the processing of raw materials, compounds, waste, and residues in a wide range of industries. Our complete line of products for mixing, agglomerating, pelletizing, grinding, granulating, and plasticizing range from 1 to 10,000 liters can also be equipped with vacuum. The results of this process technology are synonymous worldwide for some outstanding achievements in the solution of problems in diverse applications. A full line of test equipment allows for pre-sale testing in our lab or the customer's own plant.

Elsevier

Booth #514

Emirates Global Aluminium

COMPANY DESCRIPTIONS

Emirates Global Aluminium ("EGA") is a jointly-held, equal-ownership company formed in 2013 by Mubadala Development Company of Abu Dhabi and the Investment Corporation of Dubai. EGA's core operating entities are Dubai Aluminium ("DUBAL") and Emirates Aluminium ("EMAL"), whose combined annual production will reach 2.4 million tonnes per annum by mid-2014, making EGA the fifth largest aluminium producer in the world. DUBAL's inhouse developed, proprietary reduction cell technologies, DX Technology and DX+ Technology (operating at 385 kA and 450 kA respectively), currently rank among the best reduction technologies available. EGA also owns Guinea Alumina Corporation ("GAC"), a project to develop an alumina refinery and associated bauxite mine in Guinea (West Africa). As part of EGA's plans for significant local growth and international expansion, other upstream opportunities are under investigation.

Energoprom Group

Booth #231

Booth #238

EPM Group is a leading manufacturer of hi-tech electrode, cathode, graphite and carbon-based products. The Group's products are widely used in metal, chemical, nuclear, aerospace and electronics industries. The Group's sales network covers more than 60 countries around the world. The Group ranks among the top five global producers of carbon and graphite. The Group continuously expands its product portfolio and works on improving the product quality. The Group's own R&D Center develops isostatic graphite, anode materials for lithium-ion batteries, new types of composite materials for electric transport, largesized items made of silicified graphites, as well as new strategic carbon materials.

Evans Analytical Group

Evans Analytical Group (EAG) is the global leader in materials characterization for the advanced materials supply chain. We specialize in measurement of material composition, purity, contaminant levels and crystal structure using advanced analytical techniques such as: GDMS, ICPMS, SEM, TEM, XRD, XRF, XPS, SIMS, Auger and FTIR. EAG provides fast turn-around time, superior data quality and excellent results, with ISO 9001 and 17025 certification. EAG has over 15 locations in the US, Asia and Europe.

TMS 2015

Booth #201



FCT Combustion

Booth #432

FCT Combustion is a process and combustion company with more than 30 years of experience worldwide. Having a wide range of proprietary combustion equipment such as Low-NOx, Natural Gas, Coal, Oil or Multi-Fuel burners, valve trains, flame scanners, ignition pilots, and burner management systems, FCT Combustion can cater for all your needs whether kilns, Incinerators, Hot Gas Generators, Calciners, or boilers.

FEI

Booth #425

FEI is showcasing the popular Avizo® 3D visualization and analysis software application for materials research and development. Avizo provides an extensive set of tools addressing 2D and 3D data visualization, materials characterization, reconstruction of 3D models, pore networks and flow analysis, permeability/molecular diffusion/electrical resistivity calculation. Ideal for: synthetic porous materials, polycrystalline metals, geo-materials, and many more.

Fives

Booth #307

Fives specializes in the design and supply of process equipment and the management of complete installations in the three key sectors of aluminium: Reduction: Gas treatment centers on electrolysis pots and bath processing units; Carbon: High-capacity green anode plants, liquid pitch marine terminal, firing and control systems, and fume treatment centers on anode baking furnaces; and Casthouse: melting and holding furnaces, including water cooling systems and integration of downstream casting machines, heat treatment furnaces for rolling mills, and EPC solutions for secondary aluminium casthouses.

FLSmidth

Booth #207

FLSmidth is your major equipment supplier from bauxite mining and refining through calcination to smelting. Every day, worldwide, our equipment crushes, conveys, grinds, digests, clarifies, precipitates, stores, and calcines hydrate to produce alumina. Few other technology suppliers can offer such a broad range of equipment and processes while increasing recoveries, lowering energy consumption, and providing proven reliability with environmental protection. FLSmidth combined the industry's leading brands and expertise providing integrated solutions that will save valuable time on your project schedule!

FRITSCH Milling and Sizing

Booth #535

FRITSCH is an internationally respected German manufacturer of application-oriented laboratory instruments. Our instruments are used worldwide for sample preparation and particle analysis for fast paced industrial process monitoring and critical applications in QA, QC, and R&D.

Furuya Metal Americas Inc.

Booth #236

Furuya Metal Americas, Inc.'s key products include: precious metals crucibles; precious metals thermocouples; precious metals chemical compounds; precious metals sputtering targets; and precious metals refining. Furuya Metal produces industrial-use products made of platinum group metals (PGM), including platinum, rhodium, palladium, iridium, and ruthenium. PGM possess outstanding properties such as excellent heat resistance, high chemical stability, high electric conductivity, and play an important role in respective fields such as electric, optical glass, the environment, and medicine. Furuya Metal manufactures PGM products such as crucibles for crystal growth, sputtering targets, thermocouples, chemical compounds, and precious metal high-purity refining. Contact general@furuya-ma.com.

Gautschi Engineering GmbH

Booth #410

Gautschi Engineering GmbH is a leading supplier of equipment for primary aluminum casthouses and recycling plants. The product range of Gautschi[™] includes: Melting– and holding furnaces, pusher-type furnaces for rolling slab, homogenizing furnaces for extrusion billet and rolling slab, multiple chamber furnaces for coil and foil annealing, single coil annealing furnaces, horizontal D.C. casting plants, open mould ingot casting and stacking plants, vertical D.C. casters for extrusion billet and rolling slab, and AIR GLIDE® and AIRSOL VEIL® mould technology. Join us in the Exhibit Hall for the



Exhibit - Booth #235

More than 25 hand-forged knife and sword blades—crafted around the world and brought to Orlando for display—are now on exhibit for all TMS 2015 Annual Meeting & Exhibition attendees.

The exhibit includes a display of the physical blades created by teams of students and artisans, along with videos depicting the creation of the blades and posters exploring the science behind these processes.

Stop by the Bladesmithing Competition Exhibit Booth during the following exhibit hours to view the competition entries:

Monday, March 16 4:00 p.m. to 6:30 p.m.

Tuesday, March 17

10:00 a.m. to 5:30 p.m. Winners will be announced at 1:30 p.m. on Tuesday!

Wednesday, March 18

10:00 a.m. to 2:00 p.m.

A panel of judges will review the blades and the supporting videos and posters to determine first-, second-, and third-place winners among "University Students" and a first-place winner in the "Artisans and Enthusiasts" category. The winners will be announced on Tuesday, March 17, at 1:30 p.m by 2014 TMS President Hani Henein.

Come and view this unique exhibit for yourself at **Booth #235** in the Exhibit Hall.



Gillespie + Powers, Inc.

Booth #326

Our Mission: To produce an innovatively superior product by integrating science, art, and experience to give you answers found nowhere else in the industry. Gillespie + Powers, Inc. has over 75 years of experience in design, supply, and installation of high-temperature furnace equipment for the non-ferrous melting and hazardous waste industries. We work with our clients to design new equipment or modify existing equipment that works for their long-term goals without compromising flexibility in their process. Our knowledge of refractory selection, burner placement, combustion, and control sequences qualifies Gillespie + Powers, Inc. to furnish the best equipment in the industry.

GLAMA Maschinenbau GmbH

Booth #406

GLAMA has designed and built heavy-duty equipment for aluminium pot rooms, cast houses, and anode rodding shops throughout the world for more than 50 years. The following type of equipment is available: anode changing vehicles; anode pallet transporters; butt cleaning manipulators; coil lift trucks; furnace charging machines; furnace tending machines hammer crustbreakers; ladle charging trucks; molten metal carriers; and tapping trucks. GLAMA's many years of experience in producing machines with a unique combination of advanced control and rugged, reliable construction is evident in the several hundred machines now in service. GLAMA equipment withstands the heat, dust, vibration, and battering of heavy industry while delivering precise handling performance. More details: www.glama.de

GNA alutech

Booth #217

GNA is a recognized world leader in the design and construction of furnaces and equipment for the aluminum industry, especially melting and holding furnaces; homogenizing, annealing, and heat treatment furnaces; and cathode sealing equipment and associated machinery. With sales offices in Canada, Brazil and Taiwan, our equipment is in operation all across North America and in South America, Europe, India, the Middle East, extensively throughout Asia, and Australia. Service and technical support is available from GNA alliances and partners in these same countries and regions. Our advanced design, control systems, and construction techniques provide long service life and class-leading efficiency and reliability. Operator safety and comfort are primary goals in the design of our equipment: user-friendly features are built in to all GNA furnaces, extending from the access ladders/ stairways and service platforms all the way to the control systems.

Goodfellow Corporation

Booth #520

small quantities Goodfellow supplies of metals. alloys, ceramics, and polymers to meet the research, development, and specialist product requirements of the science industry worldwide. The company offers two distinct services: the first meets the needs of those customers who require small quantities of our standard catalog products for immediate shipment. The second is for those who require larger quantities or further processing of the company's standard products, or who need products, which fall within our general supply capabilities. Our web catalog lists a comprehensive range of materials in many forms including rods, wires, tubes, and foils. There is no minimum order quantity and items are in stock and ready for immediate shipment worldwide with no extra shipping charge. Custom-made items are available for special order.

Gouda Refractories

Booth #413

Gouda Refractories is an innovative refractory producer (refractory bricks, castables. mortar. self-flowing complex pre-cast shapes) with global castables. experience and a long track record of supplying superior quality refractories all over the world for more than 100 years. Gouda Refractories develops, manufactures, and sells top quality refractory linings. Gouda's solutions play an important role in non-ferrous metal (mainly aluminium), petrochemical, environmental, and energy industries. Based on an industry-oriented structure and highly competent employees, Gouda Refractories guarantees an optimal support which results in efficiency and reduction of refractory cost. Gouda Refractories supplies total solutions to customers which are cost effective, state of the art, and reliable. Gouda's R&D department is conducted in close cooperation with its customers and renowned research institutes. Gouda's quality assurance is based on the international ISO 9001 standard.



Granta Design

Booth #508

Granta will be attending the TMS 2015 Annual Meeting & Exhibition to demonstrate and discuss our software and teaching resources for materials education and research. Granta's Education Division supports anyone teaching materials or related topics across the full range of disciplines in engineering, science, and design. Granta helps to organize the Materials Education Symposia, global events for materials educators. Granta also helps customers in industry to manage materials information and make better materials decisions.

Haarslev Industries Press Technology GmbH & Co. KG B

Booth #414

Danish-based Haarslev Industries A/S has acquired the screw press technology division from German-based C.A. Picard as part of Haarslev's overall strategy and to strengthen the after sales and services business area. C.A. Picard Engineering GmbH and Co. KG will be renamed Haarslev Press Technology GmbH and Co. KG in Germany. In the United States, C.A. Picard will be merged into Haarslev Industries.

Since 1876, C.A. Picard, a family-run company based in Remscheid, Germany, has specialized in producing highly wear-resistant precision metal parts for various industries, applications, and brands. The company operates globally with eight subsidiaries and sells its products on a worldwide scale. Today we can offer optimized wear and spare parts at economical prices. We offer alternatives, no compromises!

Herbert Gleiter Institute of Nanoscience Booth #409

The Herbert Gleiter Institute of Nanoscience (HGI) in Nanjing celebrated its official opening in late October 2012. The establishment of HGI is the outcome of international attention to the development of nanoscience in China and has attracted a number of outstanding scientists to integrate here. HGI always strives to provide a highstandard, secular stable platform of academic exchanges and cooperative research, so as to promote our research level and international status in nanoscience. With humanistic characteristics as its source power, HGI will recruit talents worldwide and focus on the frontier research work in nanoscience. The purpose of HGI is to create a world-class research team and base of nanoscience and

to cultivate talents with innovative spirit through scientific research practice for innovative achievements.

Huizhou Top Metal Material Co., Ltd.

Booth #438

Hycast AS

Booth #512

Hycast—Technology from within. In 1990 Hycast AS was established by Hydro Aluminium. Today Hycast provides a one stop shop for competitive processes and quality end-products with portfolio that covers the whole casting centre, including: RAM (Removal of Alkaline Metals); SIR—inline melt refining; launder systems and rod feeders; CMV (Casting Machine Vertical); extrusion ingot; GC (Gas Cushion) and LPC (Low Pressure Casting); sheet ingot; AFM (Adjustable Flexible Moulds) and FM (Flexible Moulds); CCS (Casting Control Systems); and Hycast services, knowledge, and competence. Hycast supports customers to constantly achieve better quality at lower operation cost, thereby increasing the competiveness of its customers.

Hysitron

Booth #320

As the world leader in nanomechanical testing, Hysitron is dedicated to the development of next- generation testing solutions for nanoscale materials characterization. Hysitron's comprehensive nanomechanical testing suite of in-situ techniques (including TEM/SEM Nanomechanics, heating/cooling, nanoDMA®, and nanoECR®) and modular instrument platforms will keep you at the forefront of technology. Stop by our booth to learn about our exciting new developments and for in-depth discussions with our application specialists about our latest nanomechanical testing solutions.

www.tms.org/TMS2015



ICE Publishing

Booth #216

ICE Science is the innovative multi-disciplinary materials science series from ICE Publishing, the publishing division of the Institution of Civil Engineers, who have been uniting research and practice in science and technology since 1836. ICE Science seeks to inspire fresh thinking in how breakthrough research can be practically applied in the areas of materials science, biomaterials, nanotechnology, energy, green chemistry, and surface engineering. Launched in 2012, the ICE Science collection comprises 5 titles: Bioinspired, Biomimetic and Nanobiomaterials; Materials Research; Green Materials: Emerging Nanomaterials and Energy; and Surface Innovations. For further information, visit www.icevirtuallibrary.com/science.

Innovatherm GmbH + Co., KG

Booth #420

Innovatherm GmbH +Co KG, Butzbach/Germany, is an engineering company specialized in optimization of thermal processes. Innovatherm offers a comprehensive range of products and services including consulting, process analysis, engineering, process optimization, supervision of installation, commissioning, and maintenance. The company possesses versatile know-how, experience, and innovative technologies for improvement of customers' production facilities. The highly qualified staffs are mainly engineers who have special knowledge in treatment and optimization of thermal processes in addition to their detailed knowledge of automation and computer systems. Innovatherm also provides a wide range of products in the field of process technology and process automation, such as the ProBake firing and control system for anode/ cathode baking furnaces in the primary aluminium industry, ProClean fume treatment plants for anode baking furnaces, and ProCast process control systems for cast houses.

International ALUMINIUM Journal

Booth #522

International ALUMINIUM Journal deals with all facets of aluminium's value chain from the production of the metal via its processing through to recycling. The editorial focus is on smelting and semis production including the suppliers of plant equipment and technology. Consideration is given to economic, technical, and environmental/ecological topics as well as other aspects that affect the metal and its product applications in the different target markets. Aluminium relevant research articles from companies and institutes are also published. The publication is thus of particular interest to smelters and remelters, semis producers, foundries, fabricators and converters, metal traders, semis stock holders, and research facilities. *International ALUMINIUM Journal* is circulated in over 40 countries worldwide—made in Germany and distributed to the world. Articles that are of global interest are published in English or bilingual (German and English).

IPS Ceramics Ltd.

Booth #234

IPS is exhibiting at the TMS annual meeting for the second year running, showing an extensive selection of high purity alumina, machinable blocks for composites moulds, and silicon carbide components designed for strong performance in tough environments. We offer tiles, discs, trays, crucibles, tubes, rods, spheres, insulators, seals, threaded parts, bulb holders, wire guides, plates, rings and much more. We have 95%/99% aluminas plus the full spectrum of SiC from clay bonded to silicon infiltrated—thermally stable, technically proven, and cost competitive. We also supply one of the broadest ranges of cordierite refractories for kiln, furnace, and oven wall and roof construction, combustion superstructures, and ware support purposes. www.ipsceramics.com

LAEIS

Booth # 429

LAEIS offers hydraulic presses MEGA 2500/1600 AV for production of prebaked anodes. These presses are modifications of the renowned HPF presses, supplied more than 600 times to different industries, optimally adapted to anode production requirements. With die areas up to 1800 x 850 mm² and filling depth up to 1400 mm practically all anode formats can be produced. A vacuum system provides for optimal densification and even density distribution over the whole anode volume. The special weighing and mould filling system together with the sophisticated press control guarantees extremely high accuracy and reproducibility of anode weight and height. Depending on anode formats, production capacity is up to 30-60 t/h in a single line. The remarkably lower forming temperature results in higher green strength, avoids a separate water cooling, and reduces the emission of PAH and other pitch volatiles.



Light Metal Age

Booth #424

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Light Metal Age (LMA) is the pre-eminent magazine of the light metal world, covering the technology of primary production and semi-fabrication of the light metals. As the largest of the light metal markets, aluminum is the main focus of LMA's editorial, starting at the smelter and moving downstream to include all semi-fabricating processes, such as extrusion, rolling, and remelt. Attention is also placed on the production and processing of magnesium and titanium. Circulation is international and goes to executives, plant managers, technicians, metallurgists, and engineers at primary and secondary smelters, casthouses, extrusion operations, rolling mills, and other operations. LMA also produces select article archive content on DVDs, including the Aluminum Extrusion Article Archive (July 1943-June 2012) and the Magnesium Article Archive (May 1943-August 2011). For more info, visit our webpage: www. lightmetalage.com.

Linseis Inc.

Our company manufactures Thermal Analysis Instruments including: DTA, TGA, STA, DSC, Dilatometry, Xenon Flash, Laser Flash Thermal Conductivity Systems, Seebeck Coefficient/Electrical Resistivity Instruments, and Magnetic Suspension Balances. For complete information about all of our products, please visit our website at www. linseis.com

Maney Publishing

Booth #229

Booth #407

The Maney Publishing Materials Science & Engineering Collection is a portfolio of highly regarded, peer-reviewed journals providing both general and topical coverage of materials science and engineering. Original papers and reviews report fundamental and applied research on topics from functional materials for electronics/photonics, energy, and biomedicine, to fabrication, processing, and characterization of materials to design, properties and performances. Our growing list in geotechnical engineering, water science and technology and transportation reflects an increasing specialization in engineering. Find out more online: www.maneyonline.com/matscieng

Mecfor Inc.

Booth #210

Mecfor specializes in the design and fabrication of mobile, stationary, and custom-designed equipment used

in all sectors of the aluminium industry. We work with you to understand what you need; then we make it. All Mecfor equipment takes into account your harsh working environment. Our trademark: sturdy, reliable, and safe equipment for all operators and maintenance. Mecfor delivers on time and supports its products worldwide. Over the years, Mecfor has developed its expertise. From the engineers to the machinists, together we possess complementary know-how's, which is an added value. Proven technologies for a better equipped industrial world: www.mecfor.com

Microtrac

Booth #339

Microtrac, a pioneer of particle characterization technologies, strives to provide the world with innovative, reliable, and repeatable instruments that deliver insight and solutions to company's complex product and process problems. Microtrac's instruments can provide particle sizing, zeta potential, 3D image analysis, molecular weight, surface analysis, and particle counting measurements. Microtrac also offers contract laboratory services, as well as custom service plans designed to meet and exceed customer expectations.

Momentive Performance Materials Inc. Booth #337

For more than 75 years, Momentive Performance Materials Inc. has been supplying the world's largest companies with cutting-edge materials to create new, successful products in a number of industries, from automotive to construction to electronics to personal care. Momentive helps bring business' ideas to life quickly and efficiently through its streamlined technology development process, unparalleled commitment to customer service, and technical expertise. Based in Waterford, New York, with more than 50 manufacturing and commercial locations worldwide, Momentive places innovative technologies at customers' fingertips around the globe. Visit Momentive. com for more information.

MTI Corporation

Booth #437

MTI Corporation is a leading provider of material research equipment: serving the R&D community since 1994. It offers vast selections of goods from crystals, powders, wafers, raw battery materials and consumables/accessories, battery R&D equipment, automated machines, analysis hardware, and more.



MTS Systems Corporation

Engineers and researchers worldwide rely on MTS to address the full spectrum of materials testing——from tension/compression to fracture mechanics to complex multi-axial fatigue studies at elevated temperatures. With high-performance testing systems, versatile application software, and precision accessories, MTS provides leading-edge technology for testing advanced metals, polymers, composites, and ceramics. Standard solutions and software templates for monotonic testing applications as well as high-cycle fatigue, low-cycle fatigue, thermomechanical fatigue, and direct current potential drop applications simplify test setup and optimize efficiency. Explore the MTS booth and discover how innovative MTS solutions and decades of industry expertise can enhance your test program.

nanoHUB.org

Booth #223

Booth #428

nanoHUB.org is recognized as a global leader in nanotechnology, providing access to simulation tools and learning materials used in both research and education. This science gateway, supported through a National Science Foundation grant, has a growing user base of over 328,000 users annually. Explore our vast array of content on topics such as molecular dynamics, nanoelectronics, nanobio, and more. nanoHUB now features nanoHUB-U courses, five week modules across a variety of nanorelated fields, taught by well-known faculty. These courses are designed to be accessible to students in any branch of science and engineering, without requiring a long list of prerequisites. nanoHUB is an open access platform where cutting edge content is freely available across a global community. Visit our site and create a FREE account today!

Broad Base. Best Solutions.

Improved profitability for each electrolytic cell

SGL LANCELOT[®] for in-situ profile measurements

SGL Group – The Carbon Company, together with the leading aluminum smelting technology providers developed a tool to measure cathode surfaces and side ledge profile of the smelting pot in operational conditions.

SGL LANCELOT[®] and it's unique features allows high precision measurements inside melting aluminum bath. Surface analysis is used for wear measurement of cathodes to check it's performance as well to find indicators of potential failure. Side ledge analysis gives instant feedback about impact of process parameters changes on ledge thickness.



Cathodes SGL CARBON GmbH www.sglgroup.com/cathodes

For further details please contact lancelot@sglgroup.com





Booth #427

Booth #306

Booth #311

Nanomechanics Inc.

Booth #506 : 0

Nanomechanics, Inc. provides in-situ SEM and vacuum environment tools for measuring the mechanical properties of materials at the micro/nano scale. Our products in the InSEM line of mechanical properties microprobes offer high resolution and exceptional dynamic range. As the inventors of the nanoindenter, our staff is well-positioned to provide products, consulting services, training, and contract laboratory testing in nano indentation, scratch and wear testing, pillar compression, micro- and nano-scale tensile testing, and other characterization techniques.

Nanovea Inc.

Booth #521

From the Irvine, California office, Nanovea designs and manufactures 3D non-contact profilometers, mechanical testers, and tribometers to combine the most advanced testing capabilities in the industry: indentation hardness, scratch adhesion, wear friction, and 3D non-contact metrology at nano, micro, and macro range. Unlike other manufactures Nanovea also provides laboratory services, offering clients availability to the latest technology and optimal results through improvements in material testing standards.

Netzsch Instruments NA LLC

Booth #501

Thermal analysis and thermal properties, measurement instruments, calorimeters, and contract testing services; featuring the new DSC 214 Polyma, engineered for polymer analysis from the ground up with specially-designed furnace and sensor combination for fastest heating and cooling, new Concavus crucibles and unique samplecutting tool. Introducing new instruments for battery calorimetry: R&D 100 Award-winning IBC 284 Isothermal Battery Calorimeter for large format Li-ion batteries and new MMC Nexus calorimeter module for characterization of coin-cells. Top-loading TGA and STA (DSC-TGA) with no hang-down wires, optimized for ease-of-use and for coupling to FTIR, MS, and GC-MS. We also offer DMA, TMA, dilatometers, and DEA (Dielectric Analyzer for insitu cure monitoring). We will also feature the new LFA 467 HyperFlash Light Flash Analyzer for measurement of thermal diffusivity and thermal conductivity.

<u>Olympus</u>

Olympus DELTA Handheld XRF analyzers provide fast, reliable ID in seconds for accurate geochemistry. Designed for durability to withstand the toughest environments, DELTA XRF analyzers enable reliable sorting and analysis for superior performance in speed, LODs, and elemental range. DELTA brings the power and flexibility of handheld x-ray fluorescence spectrometry to the field. Ruggedized and ultra-portable, this dramatically fast 24/7 technology provides accelerated testing times, allowing for hundreds more tests to be conducted per day with analytical confidence.

Outotec Ltd.

Outotec develops and provides technology solutions for the sustainable use of Earth's natural resources. As the global leader in minerals and metals processing technology, Outotec has developed several breakthrough technologies. Outotec serves the light metals industries, including the provision of cutting-edge alumina refineries and aluminum smelters. Outotec has over 50 years of experience helping customers worldwide in both segments of the aluminum process to reach their goals.

Parker Hannifin

Parker is the world's leading diversified manufacturer of motion and control technologies and systems. Parker provides precision engineered solutions for a variety of commercial mobile, industrial, and aerospace markets. We design and manufacture optimal systems using fluid connectors, hydraulics, pneumatics, instrumentation, refrigeration, filters, electromechanical components, and seals required in motion control systems. Parker's experience in the aluminum industry spans more than 40 years. Parker has equipped machinery in all phases of aluminum production including smelters, casters, and extruders through grinders, rolling mills and strip processing lines, etc.

55



P-D Refractories GmbH

Booth #208 R

P-D Refractories Group belongs to the most competitive suppliers of high-quality refractories for the primary aluminium industry—especially for open and closed anode baking furnaces and the barrier-brick lining of reduction cells. We acquired the know-how over decades in the aluminium industry. Advanced manufacturing technologies combined with our continuous activities to meet our customers' needs are the basis for the success of our refractory bricks in anode baking furnaces and reduction cells. Customers from all over the world rely on our well-known qualities.

Photron Inc.

Booth #206

Photron manufactures high-speed cameras for slow motion analysis of events or phenomena that occur too fast for the eye to see or comprehend. Recording at frame rates from 60 to over one million frames per second (fps) for replay at conventional video rates of 30 fps or slower, Photron cameras are available in color or monochrome, and utilize the latest CMOS sensor technology to provide unparalleled light sensitivity and image quality, regardless of the frame rate or shutter speed selected.

Precimeter Inc.

Booth #214

Precimeter is continuously growing, developing new solutions and serving customers in the molten metal industry. With more than 25 years of experience within the industry and with the highest level of knowledge about molten metal level control, Precimeter is the brand that can be trusted to deliver the solutions you need.

PROTO Manufacturing

Booth #220

PROTO Manufacturing is a leading provider of x-ray diffraction (XRD) systems and services. Our product line includes residual stress & retained austenite measurement systems, powder diffractometers, Laue single crystal orientation systems, x-ray tubes, and custom XRD systems. For over 30 years we have been providing solutions for laboratory, factory, and field environments. Measurement services are also available through ISO 17025 laboratories in the United States, Canada, and Japan. This year we are proud to introduce our new AXRD Benchtop Powder Diffractometer.

RHI AG

RIEDHAMMER GmbH

Booth #211

Booth #426

For the Carbon Industry, Riedhammer is presently the only independent worldwide supplier able to deliver complete solutions and proven furnace technologies for baking anodes, cathodes, and electrodes, supplemented by solutions specifically tailored for the production of special carbon products. Ninety years of experience and knowhow guarantee high economic efficiency and reliability of the plants.

Rio Tinto Alcan

Booth #321

Building on more than a century of experience and expertise, Rio Tinto Alcan is a global leader in the aluminium industry. We are one of the world's largest producers of high quality bauxite, alumina and aluminium worldwide and our AP[™] smelting technology is the industry benchmark. Our leadership is reinforced by our access to the largest and best quality bauxite reserves in the industry, benchmark smelting technology, and enviable hydropower position, which delivers significant competitive advantages in today's carbon constrained world. Rio Tinto Alcan is the aluminium product group of Rio Tinto, a leading international mining company involved in each stage of metal and mineral production. The Group is listed on the London Stock Exchange and Australian Securities Exchange under the symbol RIO. Rio Tinto's major products are aluminium, copper, diamonds, coal, iron ore, uranium, gold, and industrial minerals.

ROBO-MET.3D® (A UES Product)

Booth #202

Robo-Met.3D is a fully automated, serial sectioning system that generates two-dimensional data for three-dimensional reconstruction. With sectioning rates up to 100 times faster than manual sectioning, Robo-Met.3D collects data in a matter of hours, not months. Robo-Met.3D enables more time for data analysis and characterization and ensures that repeatable and accurate data is collected in an efficient and cost-effective manner. UES Inc. is an innovative science and technology company that provides its industry and government customers with superior research and development expertise. We create products and services from our technology breakthroughs and successfully commercialize them.



ROYER Inc.

Booth #204 :

Attention workers in the metallurgical industry: Since 1934, Royer is your one stop supplier of innovative specialized safety footwear. Unique in America, our XPAN® dual density soling technology offers a lighter rubber sole, protecting the wearer from both extreme heat and cold. Moreover, this technology offers superior traction, shock absorption, and durability. Visit us and see the ULTIMATE SMELTER'S BOOT! Royer offers a wide range of specialized products with customizable features including internal and external metatarsal protectors as well as non-magnetic toecaps. Royer products meet CSA, ASTM, and CE standards.

SAWNODE Technologies Ltd.

Booth #222

Sawnode Technologies focuses solely on the design and manufacturing of circular saw blades used for slotting carbon anodes. Its unique approach produces blades that maximize the width-to-depth ratio for slots resulting in a substantial reduction in the carbon volume removed. Thus, a smelter's investment into a slotting machine is rendered a profitable one!

Seneca Ceramics Corporation

Booth #310

Seneca Ceramics specializes in the design and manufacture of ceramic component parts for use in a wide range of industries. Our unique capabilities allow us to rapidly prototype and produce both porous and dense ceramics in a wide range of complex shapes and surfaces. We can quickly create high quality bodies from a wide range of materials, while tailoring microstructure, porosity, and surface chemistry.

Sente Software

Booth #517

We offer materials-focused simulation software for modeling the behavior and properties of multi-component alloys used in industrial practice. JMatPro® calculates: stable and metastable phase equilibrium, solidification behavior and properties, mechanical properties, thermophysical and physical properties, phase transformations and chemical properties. Data export available to casting, forming, forging and heat-treatment simulation packages. www.jmatpro.com.

Shenyang Aluminum and Magnesium Engineering and Research Institute Company Limited

Booth #538

Located in Shenyang, China, Shenyang Aluminum and Magnesium Engineering and Research Institute (SAMI) is the world's leading aluminum technology supplier, professional consultant, and experienced EP and EPC contractor in non-ferrous metallurgy fields. Founded in 1951, SAMI has long been engaged in engineering or EPC of alumina, aluminum, carbon, and magnesium projects. SAMI has gained lots of proprietary technology patents and achieved unique know-how in aluminum reduction pot development (in particular 400kA, 500kA, and 600kA) with advanced 3D design/modelling software and successfully conducted engineering of more than 25,000 pots of high performance to global customers.

Shenyang Dongda Sensor Technology Co. Ltd.

Booth #515

Dongda Sensor provides a wide range of thermocouple assemblies, wire, and protection tubes for the global metal and heat treatment industries. We have extensive experience with global primary producers of aluminum with expertise in pot line control systems, as well as cast house and carbon plant operations. We work closely with clients to provide custom solutions to help them meet their operational and business needs. Our products deliver a consistently high level of performance and long service life, helping our clients realize significant cost savings while achieving compliance and sustainability objectives. Our patented products are used in vacuum furnaces, carburizing furnaces, and a wide range of applications for multipurpose industrial furnaces, including continuous temperature measurement for molten copper, iron, steel, aluminum, zinc and salt; Temperature Uniformity Surveys conforming to AMS2750D/E, and thermocouples with calibration wells; and portable on-line calibrators.



Southwire SCR Technologies

Booth #225

Southwire operates continuous casting lines for both copper and aluminum rod, and the SCR Technologies division provides equipment for continuous cast rod systems and technology. SCR aluminum systems range in capacity from 2.5 to 15 metric tons/hour of EC aluminum and alloyed aluminum rod. SCR Technologies has developed a patented state-of-the-art ultrasonic degasser that solves multiple challenges across a spectrum of aluminum casting industries. This ultrasonic degasser, marketed under the brand name Ultra-D[™] degasser, produces the highest quality of aluminum without the use of any corrosive chemicals. The Ultra-D degasser can be easily integrated into the die casting, foundry, continuous cast, and billet casting market segments.

STAS

Booth #316

STAS is a Canadian-based company and a world leader in providing various equipment to improve the production and quality of molten aluminium. Aluminium producers who can benefit from such technologies are found throughout the wide variety of aluminium producers, from primary smelter plants down to secondary operations, including rolling mills and aluminium extruders. The company has been in business for more than 25 years, with clients on all continents. Most of STAS' sales activities are managed from STAS' head office in Canada, with a network of wellknown agents in specific countries or geographical areas.

Techmo Car

Booth #315

Techmo is an Italian independent company focused in the engineering and production of special mobile and stationary equipment for the aluminium and nonferrous metals industry. The full range of purpose-designed machines covers different types of equipment performing a large number of operations in pot-rooms, rodding shops and cast-houses. The company's aim is to provide the most innovative, rational, cost effective and user friendly technical solutions. Among the most significant families of mobile equipment are the tapping vehicles, anode transporters, crucible transporters and tilters, alumina/AIF3 feeding vehicles, furnace charging vehicles and furnace tending vehicles, multipurpose anode changers, and crust breakers. Beside its line of purposed designed vehicles, Techmo provides a number of stationary equipment such as crucible cleaning machines, the crucible tilting stations, and the anode butts cleaning stations.

Tenova Core

Booth #422

Tenova Core, a multi-business unit Tenova company, based in Pittsburgh, Pennsylvania, is a worldwide leader in the supply of loose carbonaceous material calciners based on rotary hearth technology. These furnaces are used for the processing of petroleum coke, coal, formed coke briquettes, and various other carbon-based products. Tenova Core representatives will also be available to discuss our advanced aluminum furnace product line.

Thermacore Materials Technology Booth #335

MATERIALS TECHNOLOGY MEETS EXTREME PERFORMANCE.

When conditions threaten performance, extreme Thermacore's Materials Technology Division (MTD) has the unique materials capabilities to design, develop, and manufacture your mission-critical application solution. From the analysis and characterization of materials to custom alloy processing and finished product manufacturing, you'll find Thermacore technology in a wide array of applications, including ultra-high-speed flight vehicles, armaments, advanced medical devices; and data centers. Whether it's a custom specialty alloy melt for highstrength applications, high-temperature creep testing at 2,000°C (3,600°F) under a near-space level vacuum, or aluminum brazing of heat exchangers, our unique material development and processing capabilities will let you break through your material and thermal barriers. Our MTD services include: a breadth of joining services; processing, testing, materials analysis services; specialized processes; development and consultation services; and manufacturing services.

Thermo-Calc Software

Booth #200

Thermo-Calc Software is a leading developer of software and databases for calculations involving computational thermodynamics and diffusion controlled simulations. Thermo-Calc is a powerful tool for performing thermodynamic calculations for multicomponent systems. Calculations are based on thermodynamic databases produced by the CALPHAD method. Databases are available for steels, ferrous based slags, Ti, Al, Mg, Ni-superalloys, and other materials. Programming interfaces are available,



which enable Thermo-Calc to be called directly from inhouse developed software or MatLab. DICTRA is used for accurate simulations of diffusion in multicomponent alloys; applications include: homogenization of alloys; microsegregation during solidification; coarsening of precipitates; joining; and TC-PRISMA: a new tool for predictions of concurrent nucleation, growth, dissolution and coarsening of precipitate phases.

Thorpe Technologies Inc.

Booth #511

Thorpe Technologies manufactures custom mill duty furnace and process equipment for the aluminum and forging industries. Thorpe's product line includes scrap delacquering and decoating systems; stationary and tilting furnaces for melting and holding molten metal; rotary furnaces; continuous, stationary, and shuttle homogenizing and process furnaces; box and rotary hearth forging furnaces; and die heating furnaces. Thorpe also manufactures ancillary equipment including charge machines for the furnace and process equipment it manufactures. Thorpe has been serving industry's heat processing equipment needs domestically and internationally from its Los Angeles-based operations since 1932.

TMS Bladesmithing Exhibit

Booth #235

Booth #401

More than 25 teams responded to the TMS Bladesmithing Competition, which challenged participants to forge their own blades for display at the TMS Annual Meeting Exhibition. View the final products, as well as videos depicting their production, in the exhibit hall. The entries will be judged and winners will be announced in the "University Student" and "Artisan and Enthusiasts" categories on Tuesday at 1:30 at the Bladesmithing booth.

TMS Information Center

The TMS Information Center provides information on all TMS offerings in one convenient location. Stop by for information about:

- TMS Membership
- TMS Technical Initiatives
- TMS Events
- TMS Publications
- The TMS Foundation
- TMS Volunteer Opportunities

Unimet LLC

University of Central Florida AMPAC Booth #530

The University of Central Florida is home to the Advanced Materials Processing and Analysis Center (AMPAC), the NanoScience Technology Center, and the Materials Science and Engineering Department. Our faculty and students conduct in-depth research to address real-world applications in areas including energy, microelectronics, medicine, bioengineering, optics, and manufacturing.

Vollert Anlagenbau GmbH

Booth #430

Booth #516

Material handling and storage technology from Vollert stands for a maximum of productivity and resource-efficient processes in aluminium rolling and extrusion plants and in the metal industry. Considering high-bay warehouses, the most powerful stacker cranes or automatic crane systems up to 50 tons, Vollert is setting the standards worldwide. For this, customers such as Aleris, Constellium, Hydro, Novelis, and Tianjin Zhongwang have trusted in the engineering know-how and intralogistics concepts from Vollert since 1925.

Wahl Refractory Solutions

Booth #228

Wahl Refractory Solutions has been providing high quality refractory products since 1921 and has grown to be a recognized leader in the refractory industry. With expertise in refractory precast shapes and unmatched engineering capabilities, Wahl has developed numerous innovative, cost-effective, and reliable solutions to refractory problems throughout the industrial world.

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PROGRAM

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TECHNICAL PROGRAM

PROGRAM AT-A-GLANCE

	Day	Time	Building	Room	Page
2015 Functional Nanomaterials: Energy and Sensing	9				
Energy Conversion and Storage I	MON	8:30 AM	Swan	Swan 4	83
Energy Conversion and Storage II	MON	2:00 PM	Swan	Swan 4	105
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	253
Sensing and Electronics I	TUE	8:30 AM	Swan	Swan 4	130
Sensing and Electronics II	TUE	2:00 PM	Swan	Swan 4	157
Nanomaterial Fabrication I	WED	8:30 AM	Swan	Swan 4	181
Nanomaterial Fabrication II	WED	2:00 PM	Swan	Swan 4	206
2015 Light Metals Keynote					
Latest Developments in Smelting of Light Metals	MON	8:30 AM	Dolphin	Southern Hemisphere I	83
6th International Symposium on High Temperature M	letallu	gical Pro	cessing		
High Efficiency New Metallurgical Process and Technology	MON	9:30 AM	Swan	Swan 5	83
Fundamental Research of Metallurgical Process I	MON	2:00 PM	Swan	Swan 5	106
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	253
Fundamental Research of Metallurgical Process II	TUE	8:30 AM	Swan	Swan 5	131
Fundamental Research of Metallurgical Processes III	TUE	2:00 PM	Swan	Swan 5	157
Materials Preparation	WED	8:30 AM	Swan	Swan 5	182
Characterization of High Temperature Metallurgical Process	WED	2:00 PM	Swan	Peacock	206
Direct Reduction and Smelting Reduction	WED	2:00 PM	Swan	Swan 5	207
Coking, New Energy and Environment	THU	8:30 AM	Swan	Peacock	232
Utilization of Solid Slag/Wastes and Complex Ores	THU	8:30 AM	Swan	Swan 5	233
Acta Materialia Symposium					
Honoring 2015 Award Recipients Tresa Pollock and David Embury	WED	3:00 PM	Dolphin	Asia 5	207
Additive Manufacturing: Interrelationships of Fabric Constitutive Relationships Targeting Performance, a	ation, Ind Fee	dback to	Process C	Control	
Process Parameter Development in Additive Manufacturing	MON	8:30 AM	Dolphin	Northern Hemisphere A1	84
Modeling of Additive Manufacturing	MON	2:00 PM	Dolphin	Northern Hemisphere A1	106
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	254



TECHNICAL PROGRAM

	Day	Time	Building	Room	Page
The Melt Pool and Cellular Foams	TUE	8:30 AM	Dolphin	Northern Hemisphere A1	131
Mechanical Properties of Additively Manufactured Metals	TUE	2:00 PM	Dolphin	Northern Hemisphere A1	157
New Frontiers in Additive Manufacturing	WED	8:30 AM	Dolphin	Northern Hemisphere A1	182
Additive Manufacturing of Ti - 6AI - 4V	WED	2:00 PM	Dolphin	Northern Hemisphere A2	208
Electron Beam Techniques for Additive Manufacturing	WED	2:00 PM	Dolphin	Northern Hemisphere A1	208
Additive Manufacturing of Polymers and Non-metals	THU	8:30 AM	Dolphin	Northern Hemisphere A1	234
Advanced Characterization Techniques and Feedstock	THU	8:30 AM	Dolphin	Northern Hemisphere A2	234

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms

Deformation	MON	8:30 AM	Swan	Pelican 2	84
Plasticity Induced Transformation	MON	2:00 PM	Swan	Pelican 2	107
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	254
Micro-strain	TUE	8:30 AM	Swan	Pelican 2	132
Deformation Twinning	TUE	2:00 PM	Swan	Pelican 2	158
Dislocations	WED	8:30 AM	Swan	Pelican 2	183
Dislocation Structures	WED	2:00 PM	Swan	Pelican 2	209

Advanced Composites for Aerospace, Marine, and Land Applications II

Advanced Processing Techniques	MON	8:30 AM	Dolphin	Asia 5	85
Metal Matrix Composites	MON	2:00 PM	Dolphin	Asia 5	107
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	255
Composite Microstructure and Mechanical Property Characterization	TUE	8:30 AM	Dolphin	Asia 5	132
Advanced Composites and Syntactic Foams	TUE	2:00 PM	Dolphin	Asia 5	158
Carbon Fiber Reinforced Composites and Modeling & Simulations	WED	8:30 AM	Dolphin	Asia 5	183

Advanced Energy-efficient Light Metal (AI, Mg, and Ti) Extraction Technologies and Processes

Session I	WED	8:30 AM	Dolphin	Southern Hemisphere V	184
Session II	WED	2:00 PM	Dolphin	Southern Hemisphere V	209



		Day	Time	Building	Room	Page		
A	Advanced Materials and Reservoir Engineering for Extreme Oil & Gas Environments II							
	Environmental Influences of Downhole Alloys and Advanced Materials for Oil and Gas Applications I	MON	8:30 AM	Swan	Swan 7	85		
	Environmental Influences of Downhole Alloys and Advanced Materials for Oil and Gas Applications II	MON	2:00 PM	Swan	Swan 7	107		
	Nanocrystalline Materials and Novel Innovations for Oil and Gas Applications I	TUE	8:30 AM	Swan	Swan 7	133		
	Nanocrystalline Materials and Novel Innovations for Oil and Gas Applications II	TUE	2:00 PM	Swan	Swan 7	159		
Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion III								
	Introductory Session	MON	8:30 AM	Yacht & Beach	Asbury A	86		
	Wide Bandgap Semiconductors : Growth, Processing, Devices, and Packaging	MON	2:00 PM	Yacht & Beach	Asbury A	108		

	Г
Capacitors and Dielectric Materials II	

Capacitors and Dielectric Materials I

Advanced Materials in Dental and Orthopedic Applications

Session I	MON	8:30 AM	Swan	Swan 8	86
Session II	MON	2:00 PM	Swan	Swan 8	108
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	255
Session III	TUE	8:30 AM	Swan	Swan 8	133
Session IV	TUE	2:00 PM	Swan	Swan 8	159
Session V	WED	8:30 AM	Swan	Swan 8	184

TUE

TUE

8:30 AM

2:00 PM

Yacht &

Beach Yacht &

Beach

Asbury A

Asbury A

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Advances in Solidification of Metallic Alloys under External Fields

Solidification under Magnetic Field	TUE	8:30 AM	Swan	Swan 1	134
Solidification under Ultrasonic Field	TUE	2:00 PM	Swan	Swan 1	160
Modelling, Experimental Studies and Applications	WED	8:30 AM	Swan	Swan 1	185
In-situ Studies of Solidification under External Fields	WED	2:00 PM	Swan	Swan 1	210
Novel Solidification Processes and Applications	THU	8:30 AM	Swan	Swan 1	234

Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu

Solidification Processing I	MON	8:30 AM	Swan	Swan 6	86
Solidification Processing II	MON	2:00 PM	Swan	Swan 6	109



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TUE	8:30 AM	Swan	Swan 6	134
TUE	2:00 PM	Swan	Swan 6	160
WED	8:30 AM	Swan	Swan 7	185
WED	8:30 AM	Swan	Swan 6	186
WED	2:00 PM	Swan	Swan 7	210
WED	2:00 PM	Swan	Swan 6	211
THU	8:30 AM	Swan	Swan 7	235
THU	8:30 AM	Swan	Swan 6	235
s				
MON	8:30 AM	Dolphin	Europe 7	87
MON	2:00 PM	Dolphin	Europe 7	109
MON	6:30 PM	Dolphin	Atlantic Hall	256
TUE	8:30 AM	Dolphin	Europe 7	135
TUE	2:00 PM	Dolphin	Europe 7	161
WED	8:30 AM	Dolphin	Europe 7	186
WED	2:00 PM	Dolphin	Europe 7	211
THU	8:30 AM	Dolphin	Europe 7	236
	Day TUE TUE WED WED THU THU THU MON MON TUE TUE WED WED TUE TUE	Day Time TUE 8:30 AM TUE 2:00 PM WED 8:30 AM WED 8:30 AM WED 2:00 PM WED 2:00 PM WED 2:00 PM THU 8:30 AM MON 2:00 PM MON 6:30 PM TUE 8:30 AM TUE 8:30 AM WED 2:00 PM WED 8:30 AM TUE 2:00 PM WED 8:30 AM TUE 2:00 PM	DayTimeBuildingTUE8:30 AMSwanTUE2:00 PMSwanWED8:30 AMSwanWED8:30 AMSwanWED2:00 PMSwanWED2:00 PMSwanTHU8:30 AMSwanTHU8:30 AMSwanTHU8:30 AMSwanTHU8:30 AMSwanTHU8:30 AMSwanTHU8:30 AMDolphinMON2:00 PMDolphinMON6:30 PMDolphinTUE8:30 AMDolphinTUE2:00 PMDolphinWED3:30 AMDolphinTUE2:00 PMDolphinTUE2:00 PMDolphinTUE2:00 PMDolphinTUE2:00 PMDolphinTUE8:30 AMDolphinWED8:30 AMDolphinWED8:30 AMDolphin	DayTimeBuildingRoomTUE8:30 AMSwanSwan 6TUE2:00 PMSwanSwan 6WED8:30 AMSwanSwan 7WED8:30 AMSwanSwan 7WED2:00 PMSwanSwan 6WED2:00 PMSwanSwan 7WED2:00 PMSwanSwan 7WED2:00 PMSwanSwan 6THU8:30 AMSwanSwan 7THU8:30 AMSwanSwan 6THU8:30 AMDolphinEurope 7MON2:00 PMDolphinEurope 7MON6:30 PMDolphinEurope 7TUE8:30 AMDolphinEurope 7TUE3:00 AMDolphinEurope 7WED8:30 AMDolphinEurope 7WED8:30 AMDolphinEurope 7WED8:30 AMDolphinEurope 7WED8:30 AMDolphinEurope 7WED8:30 AMDolphinEurope 7WED8:30 AMDolphinEurope 7WED2:00 PMDolphinEurope 7

Alloys and Compounds for Thermoelectric and Solar Cell Applications III

Session I	MON	8:30 AM	Dolphin	Europe 5	87
Session II	MON	2:00 PM	Dolphin	Europe 5	110
Session III	TUE	8:30 AM	Dolphin	Europe 5	135
Session IV	TUE	2:00 PM	Dolphin	Europe 5	161
Session V	WED	8:30 AM	Dolphin	Europe 5	186

Alumina and Bauxite

Bauxite and Beneficiation	MON	2:00 PM	Dolphin	Southern Hemisphere IV	110
Digestion	TUE	8:30 AM	Dolphin	Southern Hemisphere IV	135
Precipitation and Calcination	TUE	2:00 PM	Dolphin	Southern Hemisphere IV	162



TECHNICAL PROGRAM

PROGRAM AT-A-GLANCE

	Day	Time	Building	Room	Page
Red Mud Disposal and Utilisation	WED	8:30 AM	Dolphin	Southern Hemisphere IV	187
Alternative Raw Materials and Processes, I	ndustrial Trends WED	2:00 PM	Dolphin	Southern Hemisphere IV	212
Aluminum Alloys: Development, Cha	aracterization, and App	lications			
Material Characterization	MON	2:00 PM	Dolphin	Northern Hemisphere E3	110
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	256
Development and Applications	TUE	8:30 AM	Dolphin	Northern Hemisphere E3	136
Simulation and Modeling	TUE	2:00 PM	Dolphin	Northern Hemisphere E3	162
Casting and Solidification	WED	8:30 AM	Dolphin	Northern Hemisphere E3	187
Deformation and Texture	WED	2:00 PM	Dolphin	Northern Hemisphere E3	212
Advanced Analysis	WED	2:00 PM	Dolphin	Northern Hemisphere E4	212
Precipitation Behaviors	THU	8:30 AM	Dolphin	Northern Hemisphere E3	236
Corrosion Resistance and Emerging Techn	ologies THU	8:30 AM	Dolphin	Northern Hemisphere E4	236
Aluminum Processing			•		
Session I	MON	2:00 PM	Dolphin	Southern Hemisphere I	111
Session II	TUE	8:30 AM	Dolphin	Southern Hemisphere I	136
Aluminum Reduction Technology					
Cell Technologies and Design	MON	2:00 PM	Dolphin	Southern Hemisphere III	111
Fundamentals Chemistry	TUE	8:30 AM	Dolphin	Southern Hemisphere V	137
Environment I	TUE	8:30 AM	Dolphin	Southern Hemisphere III	137
Environment II	TUE	2:00 PM	Dolphin	Southern Hemisphere III	162
Fundamentals Chemistry II	TUE	2:00 PM	Dolphin	Southern Hemisphere V	163
Materials and Equipment	WED	8:30 AM	Dolphin	Southern Hemisphere III	187
Operations and Energy Consumption	WED	2:00 PM	Dolphin	Southern Hemisphere III	213
Modelling	THU	8:30 AM	Dolphin	Southern Hemisphere III	237
Joint Session on Electrodes and Operation Technology)	s (with Electrode THU	8:30 AM	Dolphin	Southern Hemisphere V	237

Building

Room



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Biological Materials Science Symposium					
Multiscale Mechanics of Biological and Bioinspired Materials	MON	8:30 AM	Swan	Swan 9	87
Characterization of Natural and Biological Materials	MON	2:00 PM	Swan	Swan 9	111
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	257
Biomimetic Systems I	TUE	8:30 AM	Swan	Swan 9	137
Biomimetic Systems II	TUE	2:00 PM	Swan	Swan 9	163
Biomimetic Systems III	WED	8:30 AM	Swan	Swan 9	188
Biointerfaces for Biomedical Applications	WED	2:00 PM	Swan	Swan 9	213
Biomimetic Systems IV	THU	8:30 AM	Swan	Swan 9	237
Bulk Metallic Glasses XII					
Alloy Development and Application I	MON	8:30 AM	Dolphin	Asia 4	88
Alloy Development and Application II	MON	2:00 PM	Dolphin	Asia 4	112
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	257
Student Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	258
Structures and Mechanical Properties I	TUE	8:30 AM	Dolphin	Asia 4	138
Structures and Mechanical Properties II	TUE	2:00 PM	Dolphin	Asia 4	163
Fatigue and Other Properties	WED	8:30 AM	Dolphin	Asia 4	188
Mechanical and Other Properties	WED	2:00 PM	Dolphin	Asia 3	214
Structures and Modeling	WED	2:00 PM	Dolphin	Asia 4	214
General Session	THU	8:30 AM	Dolphin	Asia 3	238

CALPHAD-Based ICME Research for Materials Genomic Design

CALPHAD, ICME, and Materials Genome	MON	8:30 AM	Dolphin	Northern Hemisphere A2	88
Materials Genome: ICME and CALPHAD-Based Materials Design 1	MON	2:00 PM	Dolphin	Northern Hemisphere A2	112
Materials Genome: ICME and CALPHAD-Based Materials Design 2	TUE	8:30 AM	Dolphin	Northern Hemisphere A2	138
Materials Genome: ICME and CALPHAD-Based Materials Design 3	TUE	2:00 PM	Dolphin	Northern Hemisphere A2	164
Materials Genome: ICME and CALPHAD-Based Materials Design 4	WED	8:30 AM	Dolphin	Northern Hemisphere A2	189

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	Day	Time	Building	Room	Page
Materials Genome: ICME and CALPHAD-Based Materials Design 5	THU	8:30 AM	Dolphin	Northern Hemisphere A4	238
st Shop for Aluminum Production					
Direct Chill Casting	MON	2:00 PM	Dolphin	Northern Hemisphere E4	113
Furnaces and Energy Efficiency	TUE	8:30 AM	Dolphin	Northern Hemisphere E4	139
letal Treatment, Alloying, and Grain Refinement	TUE	2:00 PM	Dolphin	Northern Hemisphere E4	164
letal Quality	WED	8:30 AM	Dolphin	Northern Hemisphere E4	189
ieneral Cast Shop	WED	2:00 PM	Dolphin	Southern Hemisphere III	215
racterization of Materials through High Resolution	ion Coh	erent Ima	aging		
Coherent Imaging	MON	8:30 AM	Swan	Macaw 2	89
Coherent and Phase Contrast Imaging	MON	2:00 PM	Swan	Macaw 2	113
Phase Contrast Imaging	TUE	8:30 AM	Swan	Macaw 2	139
aracterization of Minerals, Metals, and Materials					
Characterization of Ferrous Metals	MON	8:30 AM	Swan	Mockingbird 1	89
Characterization of Welding and Solidification	MON	2:00 PM	Swan	Mockingbird 1	113
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	259
Method Development in Characterization	TUE	8:30 AM	Swan	Mockingbird 1	139
Characterization of Material Processing and Corrosion	TUE	2:00 PM	Swan	Macaw 2	165
Characterization of Composites	TUE	2:00 PM	Swan	Mockingbird 1	165
Characterization of Non-Ferrous Metals	WED	8:30 AM	Swan	Macaw 2	190
Characterization of Materials Extraction	WED	8:30 AM	Swan	Mockingbird 1	190
Characterization of Soft Materials	WED	2:00 PM	Swan	Mockingbird 1	215
Characterization of Minerals	WED	2:00 PM	Swan	Macaw 2	215
Characterization of Clays and Ceramics	THU	8:30 AM	Swan	Mockingbird 1	239
Characterization of Electronic, Magnetic, Environmental, and Advanced Materials	THU	8:30 AM	Swan	Pelican 1	239
naracterization of Nuclear Reactor Materials and F adiation	uels wi	th Neutro	on and Syr	nchrotron	

Session I	MON	8:30 AM	Yacht & Beach	Grand Harbor Salon 5	90	
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TECHNICAL PROGRAM

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	Session II	MON	2:00 PM	Yacht & Beach	Grand Harbor Salon 5	114
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	262
Co	omputational Modeling and Stochastic Methods for	Mater	ials Disc	overy and	Properties	
	Empirical Potentials	MON	8:30 AM	Dolphin	Northern Hemisphere A4	90
	Materials Discovery and Characterization	MON	2:00 PM	Dolphin	Northern Hemisphere A4	114
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	263
	Stochastic, Statistic, and Multiscale Methods	TUE	8:30 AM	Dolphin	Northern Hemisphere A4	140
	Computational Materials Design I	TUE	2:00 PM	Dolphin	Northern Hemisphere A4	166
	Computational Materials Design II	WED	8:30 AM	Dolphin	Northern Hemisphere A4	191
	Materials for Energy Applications	WED	2:00 PM	Dolphin	Northern Hemisphere A4	216
Co	omputational Thermodynamics and Kinetics					
	Diffusion and Defect Dynamics	MON	8:30 AM	Dolphin	Oceanic 3	91
	Phase Transformations and Kinetic-Ruled Behavior	MON	2:00 PM	Dolphin	Oceanic 3	115
	Poster Session I	MON	6:30 PM	Dolphin	Atlantic Hall	263
	Poster Session II	MON	6:30 PM	Dolphin	Atlantic Hall	264
	Grain Boundary and Grain Growth	TUE	8:30 AM	Dolphin	Oceanic 3	140
	Interfaces and Surfaces	TUE	2:00 PM	Dolphin	Oceanic 3	166
	Precipitates	WED	8:30 AM	Dolphin	Oceanic 3	191
	Phase Diagrams and Phase Stability	WED	2:00 PM	Dolphin	Oceanic 3	217
	Energy-Storage Materials	WED	2:00 PM	Dolphin	Oceanic 2	216
	Models and Methods	THU	8:30 AM	Dolphin	Oceanic 3	240
	Phase Field Modeling	THU	8:30 AM	Dolphin	Oceanic 2	240
Co Ar	אס אין	aterial Birthda	s: Iy			
	Microstructure Evolution and Constitutive Response I	MON	8:30 AM	Dolphin	Asia 2	91
	Microstructure Evolution and Constitutive Response II	MON	2:00 PM	Dolphin	Asia 2	115
	Dynamic Damage Evolution and Defect Storage	TUE	8:30 AM	Dolphin	Asia 2	141



TUE

2:00 PM



Asia 2

Dolphin

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PROGRAM AT-A-GLANCE

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Deformation and Damage Evolution	WED	8:30 AM	Dolphin	Asia 2	192
Constitutive Modeling	WED	2:00 PM	Dolphin	Asia 2	217
Development of "Weak Links" during the Processin	g of Me	tallic Ma	terials		
Overview	MON	8:30 AM	Swan	Peacock	92
Microstructure Characterization	MON	2:00 PM	Swan	Peacock	116
Microstructure Evolution	TUE	8:30 AM	Swan	Peacock	141
Joining and Bonding	TUE	2:00 PM	Swan	Peacock	167
Properties	WED	8:30 AM	Swan	Peacock	192
Drying, Roasting, and Calcining of Minerals					
Roasting	TUE	2:00 PM	Yacht & Beach	Grand Harbor Salon 3	168
Drying and Calcining	WED	8:30 AM	Yacht & Beach	Grand Harbor Salon 3	192
Fluidization, Reduction Roasting, and Microwave Treatment	WED	2:00 PM	Yacht & Beach	Grand Harbor Salon 3	218
Induration and Sintering	THU	8:30 AM	Yacht & Beach	Grand Harbor Salon 3	241
Sintering and Energy Use	THU	2:00 PM	Yacht & Beach	Grand Harbor Salon 3	250
Dynamic Probing of Microstructure Evolution in Na	nostruc	tured Ma	terials		
Dynamic Probing Technique	MON	8:30 AM	Swan	Mockingbird 2	92
Impurity and Twinning Effects	MON	2:00 PM	Swan	Mockingbird 2	116
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	264
Interface Mediated Deformation Mechanism	TUE	8:30 AM	Swan	Mockingbird 2	142
Size Effect and Fracture/Fatigue Studies	TUE	2:00 PM	Swan	Mockingbird 2	168
Low Dimensional Materials	WED	8:30 AM	Swan	Mockingbird 2	193
Grain Boundaries Effects	WED	2:00 PM	Swan	Mockingbird 2	218
Electrode Technology for Aluminum Production					
Anode Raw Materials	MON	2:00 PM	Dolphin	Southern Hemisphere II	117
Anode Forming and Baking	TUE	8:30 AM	Dolphin	Southern Hemisphere II	142
Anode Properties	TUE	2:00 PM	Dolphin	Southern Hemisphere II	168

WED

8:30 AM

Dolphin

Southern Hemisphere II

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Anode Rodding and Inert Anodes

PROGRAM	AT-A-GLANCE



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nergy Technologies and Carbon Dioxide Manageme	ent Syr	nposium	2015		
Carbon Management	TUE	8:30 AM	Yacht & Beach	Grand Harbor Salon 4	142
Iron & Steel	TUE	2:00 PM	Yacht & Beach	Grand Harbor Salon 4	169
Metal Processing/ Molten Salt/ Electrochemistry	WED	8:30 AM	Yacht & Beach	Grand Harbor Salon 4	194
Solar Energy	WED	2:00 PM	Yacht & Beach	Grand Harbor Salon 4	218
ngineering Solutions for Sustainability: Materials &	Reso	urces (ES	S: M&R)		
Plenary Session I	WED	8:30 AM	Yacht & Beach	Grand Harbor North Ballroom	194
Advanced Automotive Design	WED	10:30 AM	Yacht & Beach	Asbury A	194
Energy Challenges & Solutions	WED	2:00 PM	Yacht & Beach	Asbury C	220
Beneficial Use of Waste Products and Recycling	WED	2:00 PM	Yacht & Beach	Asbury A	219
Biomaterials, Biofuels and Green Chemistry	WED	2:00 PM	Yacht & Beach	Asbury B	219
Metrics, Design & Policy	WED	2:00 PM	Yacht & Beach	Grand Harbor Salon 5	220
Poster Session	WED	5:30 PM	Yacht & Beach	Asbury Lobby	278
Plenary Session II	THU	8:30 AM	Yacht & Beach	Asbury A	241
Alloys for the Future	THU	10:30 AM	Yacht & Beach	Asbury A	241
Innovations in Processing to Meet Emerging Demands	THU	2:00 PM	Yacht & Beach	Asbury B	251
Ensuring Resource Supplies with Smarter Technology	THU	2:00 PM	Yacht & Beach	Asbury A	251
Steel: Green Manufacturing & Properties	THU	2:00 PM	Yacht & Beach	Asbury C	252
PD 2015 Technical Division Student Poster Contest					
EPD 2015 Student Poster Contest - Graduate	MON	3:30 PM	Dolphin	Atlantic Hall	264
EPD 2015 Student Poster Contest - Undergraduate	MON	3:30 PM	Dolphin	Atlantic Hall	265
PD 2015 Technical Division Young Professional Pos	ter Co	ntest			
EPD 2015 Technical Division Young Professional Poster Contest	MON	6:30 PM	Dolphin	Atlantic Hall	265
PD Distinguished Lecture					
EPD Distinguished Lecture	MON	8:30 AM	Yacht & Beach	Grand Harbor Salon 2	92

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PROGRAM AT-A-GLANCE

			Timo	Duilding	Doom	Dogo
		Day	Time	Bullaing	Room	Page
Fa	itigue in Materials: Fundamentals, Multiscale Model	ling, Li	ife Predic	tion and F	Prevention	
	Understanding Microstructural 3-D Effects and Fatigue Mechanism	MON	8:30 AM	Dolphin	Australia 3	93
	Modeling Fatigue Behaviors and Life Prediction	MON	2:00 PM	Dolphin	Australia 3	117
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	265
	Microstructure Effects on Fatigue Properties	TUE	8:30 AM	Dolphin	Australia 3	143
	General Session	TUE	8:30 AM	Dolphin	Oceanic 4	143
	Fatigue Behaviors of Nano-Materials	TUE	2:00 PM	Dolphin	Australia 3	169
	Crack Propagation and Low Cycle Fatigue	WED	8:30 AM	Dolphin	Australia 3	195
	Effects of Loading and Environment on Fatigue Properties	WED	2:00 PM	Dolphin	Australia 3	221
	Fatigue Behaviors of Engineering Alloys	THU	8:30 AM	Dolphin	Australia 3	242
F٨	ID 2015 Technical Division Student Poster Contest					
	FMD 2015 Student Poster Contest - Graduate	MON	3:30 PM	Dolphin	Atlantic Hall	265
	FMD 2015 Student Poster Contest - Undergraduate	MON	3:30 PM	Dolphin	Atlantic Hall	265
FN	ID 2015 Technical Division Young Professional Pos	ter Co	ntest			
	FMD 2015 Technical Division Young Professional Poster Contest	MON	6:30 PM	Dolphin	Atlantic Hall	266
Fr	iction Stir Welding and Processing VIII					
	High Temperature Materials I	MON	8:30 AM	Dolphin	Northern Hemisphere A3	93
	High Temperature Materials II	MON	2:00 PM	Dolphin	Northern Hemisphere A3	118
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	266
	Aluminum and Magnesium Alloys	TUE	8:30 AM	Dolphin	Northern Hemisphere A3	144

Friction Stir Processing Friction Stir Related Technologies Simulations and Measurements

Frustrated Ferroic Materials

Dissimilar Materials

General Principles and Commonalities	TUE	8:30 AM	Dolphin	Europe 1	144
Modeling and Simulation	TUE	2:00 PM	Dolphin	Europe 1	170

TUE

WED

WED

THU

2:00 PM

8:30 AM

2:00 PM

8:30 AM

Dolphin

Dolphin

Dolphin

Dolphin

Northern

Hemisphere A3 Northern

Hemisphere A3 Northern

Hemisphere A3 Northern

Hemisphere A3

170

195

221

242



TECHNICAL PROGRAM

Strain Glasses WED 8:30 AM Dolphin Fundamental Methods for Integrating Microstructure-Property-Design Relations ICME Paradigm Microstructure Characterization and Representation MON 8:30 AM Dolphin Measurement and Modeling of Multi-Scale Deformation MON 2:00 PM Dolphin Mechanics and Multi-Scale Modeling TUE 8:30 AM Dolphin Crystal Plasticity and Uncertainty Quantification TUE 2:00 PM Dolphin General Poster Session MON 6:30 PM Dolphin High-Entropy Alloys III HEAS Special Poster MON 6:30 PM Dolphin Alloy Development and Applications TUE 8:30 AM Dolphin 0 Structures and Mechanical Properties TUE 2:00 PM Dolphin 0 Other Properties I WED 8:30 AM Dolphin 0 High-Performance Aerospace Alloys Design using ICME Approach MON 8:30 AM Dolphin 0 Session II MON 8:30 AM Dolphin 0 0 0 Session IV TUE 8:30 AM Dolphin 0			Day	Time	Building	Room	Page
Fundamental Methods for Integrating Microstructure-Property-Design Relations ICME Paradigm Microstructure Characterization and Representation MON 8:30 AM Dolphin Microstructure Characterization and Representation MON 2:00 PM Dolphin Image: Color PM		Strain Glasses	WED	8:30 AM	Dolphin	Europe 1	195
Microstructure Characterization and Representation MON 8:30 AM Dolphin Measurement and Modeling of Multi-Scale Deformation MON 2:00 PM Dolphin Mechanics and Multi-Scale Modeling TUE 8:30 AM Dolphin Crystal Plasticity and Uncertainty Quantification TUE 2:00 PM Dolphin General Poster Session MON 6:30 PM Dolphin HEAS Special Poster Session MON 6:30 PM Dolphin HEAS Special Poster MON 6:30 PM Dolphin Alloy Development and Applications TUE 8:30 AM Dolphin Structures and Mechanical Properties TUE 8:30 AM Dolphin Other Properties I WED 8:30 AM Dolphin General Session THU 8:30 AM Dolphin Modeling and Mechanical Properties THU 8:30 AM Dolphin Modeling and Mechanical Properties MON 8:30 AM Dolphin Session I MON 8:30 AM Dolphin Session II MON 8:30 AM Dolph	Fui ICN	ndamental Methods for Integrating Microstructure ME Paradigm	-Prope	erty-Desig	gn Relatio	nships into t	he
Measurement and Modeling of Multi-Scale DeformationMON2:00 PMDolphinMechanics and Multi-Scale ModelingTUE8:30 AMDolphinICrystal Plasticity and Uncertainty QuantificationTUE2:00 PMDolphinITUE2:00 PMDolphinIGeneral Poster SessionMON6:30 PMDolphinHEAS Special PosterMON6:30 PMDolphinAlloy Development and ApplicationsTUE8:30 AMDolphinIStructures and Mechanical PropertiesTUE2:00 PMDolphinIOther Properties IWED8:30 AMDolphinIOther Properties IIWED2:00 PMDolphinIModeling and Mechanical PropertiesTHU8:30 AMDolphinIModeling and Mechanical PropertiesTHU8:30 AMDolphinIModeling and Mechanical PropertiesTHU8:30 AMDolphinIModeling and Mechanical PropertiesMON8:30 AMDolphinISession IMON8:30 AMDolphinISession IIMON8:30 AMDolphinISession IVTUE8:30 AMDolphinISession IVWED8:30 AMDolphinISession IVWED8:30 AMDolphinISession IVWED8:30 AMDolphinISession IVWED8:30 AMDolphinISession IV <td></td> <td>Microstructure Characterization and Representation</td> <td>MON</td> <td>8:30 AM</td> <td>Dolphin</td> <td>Oceanic 2</td> <td>94</td>		Microstructure Characterization and Representation	MON	8:30 AM	Dolphin	Oceanic 2	94
Mechanics and Multi-Scale ModelingTUE8:30 AMDolphinCrystal Plasticity and Uncertainty QuantificationTUE2:00 PMDolphinGeneral Poster SessionMON6:30 PMDolphinHEAS Special PosterMON6:30 PMDolphinAlloy Development and ApplicationsTUE8:30 AMDolphin1Structures and Mechanical PropertiesTUE2:00 PMDolphin1Other Properties IWED8:30 AMDolphin1General SessionTUE2:00 PMDolphin1Other Properties IIWED2:00 PMDolphin1General SessionTHU8:30 AMDolphin1Modeling and Mechanical PropertiesTHU8:30 AMDolphin1Session IMON2:00 PMDolphin1Session IIMON2:00 PMDolphin1Session IVSigs in IIMON2:00 PMDolphin1Session IVTUE8:30 AMDolphin1Session IVWED8:30 AMDolphin1Session IV <td< td=""><td></td><td>Measurement and Modeling of Multi-Scale Deformation</td><td>MON</td><td>2:00 PM</td><td>Dolphin</td><td>Oceanic 2</td><td>118</td></td<>		Measurement and Modeling of Multi-Scale Deformation	MON	2:00 PM	Dolphin	Oceanic 2	118
TUE 2:00 PM Dolphin General Poster Session MON 6:30 PM Dolphin HEAs Special Poster MION 6:30 PM Dolphin Alloy Development and Applications TUE 8:30 AM Dolphin Structures and Mechanical Properties TUE 2:00 PM Dolphin Other Properties I WED 8:30 AM Dolphin 1 Other Properties II WED 2:00 PM Dolphin 1 Modeling and Mechanical Properties THU 8:30 AM Dolphin 1 Modeling and Mechanical Properties THU 8:30 AM Dolphin 1 Modeling and Mechanical Properties THU 8:30 AM Dolphin 1 Session I MON 8:30 AM Dolphin 1 Session II MON 8:30 AM Dolphin 1 Session IV TUE 8:30 AM Dolphin 1 Session IV WED 8:30 AM Dolphin 1 Session IV WED 8:30 AM Dolphin 1 <td< td=""><td></td><td>Mechanics and Multi-Scale Modeling</td><td>TUE</td><td>8:30 AM</td><td>Dolphin</td><td>Oceanic 2</td><td>145</td></td<>		Mechanics and Multi-Scale Modeling	TUE	8:30 AM	Dolphin	Oceanic 2	145
General Poster Session MON 6:30 PM Dolphin Heigh-Entropy Alloys III HEAs Special Poster MON 6:30 PM Dolphin Alloy Development and Applications TUE 8:30 AM Dolphin Structures and Mechanical Properties TUE 2:00 PM Dolphin Other Properties I WED 8:30 AM Dolphin 0 Other Properties II WED 2:00 PM Dolphin 0 Other Properties II WED 2:00 PM Dolphin 0 Modeling and Mechanical Properties THU 8:30 AM Dolphin 0 Modeling and Mechanical Properties THU 8:30 AM Dolphin 0 Session I Session I MON 8:30 AM Dolphin 0 Session III Session IV 2:00 PM Dolphin 0 Session IV TUE 2:00 PM Dolphin 0 Session IV WED 8:30 AM Dolphin 0 Session IV WED 8:30 AM Dolphin 0 Session IV WED 8:30 AM D		Crystal Plasticity and Uncertainty Quantification	TUE	2:00 PM	Dolphin	Oceanic 2	171
General Poster SessionMON6:30 PMDolphinHigh-Entropy Alloys IIIHEAs Special PosterMON6:30 PMDolphinAlloy Development and ApplicationsTUE8:30 AMDolphinStructures and Mechanical PropertiesTUE2:00 PMDolphinOther Properties IWED8:30 AMDolphinIOther Properties IIWED2:00 PMDolphinIGeneral SessionTHU8:30 AMDolphinIModeling and Mechanical PropertiesTHU8:30 AMDolphinISession ISession IMON8:30 AMDolphinISession IISession IIITUE8:30 AMDolphinISession IVTUE8:30 AMDolphinIISession IVTUE8:30 AMDolphinISession VWED8:30 AMDolphinIHigh-Temperature Electrochemistry IIWED8:30 AMDolphin	Ge	neral Poster Session					
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HEAs Special PosterMON6:30 PMDolphinAlloy Development and ApplicationsTUE8:30 AMDolphinIStructures and Mechanical PropertiesTUE2:00 PMDolphinIOther Properties IWED8:30 AMDolphinIOther Properties IIWED2:00 PMDolphinIGeneral SessionTHU8:30 AMDolphinIModeling and Mechanical PropertiesTHU8:30 AMDolphinIHigh-Performance Aerospace Alloys Design using UEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE	Hig	gh-Entropy Alloys III					
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Structures and Mechanical PropertiesTUE2:00 PMDolphinOther Properties IWED8:30 AMDolphinIOther Properties IIWED2:00 PMDolphinIGeneral SessionTHU8:30 AMDolphinIModeling and Mechanical PropertiesTHU8:30 AMDolphinIHigh-Performance Aerospace Alloys Design using ICME ApproachDolphinISession ISession IIMON8:30 AMDolphinSession IIITUE8:30 AMDolphinISession IVTUE2:00 PMDolphinISession VWED8:30 AMDolphinIHigh-Temperature Electrochemistry IIIII		Alloy Development and Applications	TUE	8:30 AM	Dolphin	Oceanic 5	145
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Other Properties IIWED2:00 PMDolphinGeneral SessionTHU8:30 AMDolphinIModeling and Mechanical PropertiesTHU8:30 AMDolphinIHigh-Performance Aerospace Alloys Design using ICME ApproachSession IMON8:30 AMDolphinISession IMON8:30 AMDolphinIIISession IIITUE8:30 AMDolphinIISession IVTUE8:30 AMDolphinIISession VWED8:30 AMDolphinIIHigh-Temperature Electrochemistry IIIIII		Other Properties I	WED	8:30 AM	Dolphin	Oceanic 5	196
General SessionTHU8:30 AMDolphinModeling and Mechanical PropertiesTHU8:30 AMDolphinHIGH-Performance Aerospace Alloys Design using ICWE ApproachSession IMON8:30 AMDolphinSession IIMON2:00 PMDolphin1Session IIITUE8:30 AMDolphin1Session IVTUE8:30 AMDolphin1Session IVTUE8:30 AMDolphin1High-Temperature Electrochemistry IIKetKetKet		Other Properties II	WED	2:00 PM	Dolphin	Oceanic 5	222
Modeling and Mechanical Properties THU 8:30 AM Dolphin High-Performance Aerospace Alloys Design using ICME Approach Session I MON 8:30 AM Dolphin Session II MON 2:00 PM Dolphin 1 Session III TUE 8:30 AM Dolphin 1 Session IV TUE 8:30 AM Dolphin 1 Session V WED 8:30 AM Dolphin 1 High-Temperature Electrochemistry II TUE 500 AM Dolphin 1		General Session	THU	8:30 AM	Dolphin	Oceanic 8	243
High-Performance Aerospace Alloys Design using ICME Approach Session I MON 8:30 AM Dolphin Session II MON 2:00 PM Dolphin I Session III TUE 8:30 AM Dolphin I Session IV TUE 2:00 PM Dolphin I Session IV TUE 8:30 AM Dolphin I Session V WED 8:30 AM Dolphin I High-Temperature Electrochemistry II Ket Ket Ket Ket		Modeling and Mechanical Properties	THU	8:30 AM	Dolphin	Oceanic 5	243
Session I MON 8:30 AM Dolphin Image: Session II Session III TUE 8:30 AM Dolphin Image: Session III Session IV TUE 2:00 PM Dolphin Image: Session IV Session V TUE 2:00 PM Dolphin Image: Session V High-Temperature Electrochemistry II	Hig	gh-Performance Aerospace Alloys Design using IC	ME Ap	proach			
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Session III TUE 8:30 AM Dolphin Session IV TUE 2:00 PM Dolphin Session V WED 8:30 AM Dolphin High-Temperature Electrochemistry II		Session II	MON	2:00 PM	Dolphin	Oceanic 6	119
Session IV TUE 2:00 PM Dolphin Session V WED 8:30 AM Dolphin High-Temperature Electrochemistry II		Session III	TUE	8:30 AM	Dolphin	Oceanic 6	146
Session V WED 8:30 AM Dolphin High-Temperature Electrochemistry II		Session IV	TUE	2:00 PM	Dolphin	Oceanic 6	172
High-Temperature Electrochemistry II		Session V	WED	8:30 AM	Dolphin	Oceanic 6	196
	Hig	gh-Temperature Electrochemistry II					
Molten Salt Technology MON 9:30 AM Yacht & C Beach		Molten Salt Technology	MON	9:30 AM	Yacht & Beach	Grand Harbor Salon 2	94
Nuclear and Rare Earth Technology MON 2:00 PM Yacht & Beach O		Nuclear and Rare Earth Technology	MON	2:00 PM	Yacht & Beach	Grand Harbor Salon 2	119
Sensors and Advanced Materials TUE 8:30 AM Yacht & Beach Yacht		Sensors and Advanced Materials	TUE	8:30 AM	Yacht & Beach	Grand Harbor Salon 2	146
Energy Storage Devices, Corrosion and Molten Salt Science TUE 2:00 PM Yacht & Beach C		Energy Storage Devices, Corrosion and Molten Salt Science	TUE	2:00 PM	Yacht & Beach	Grand Harbor Salon 2	172



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Corrosion and Molten Salt Science	WED	8:30 AM	Yacht & Beach	Grand Harbor Salon 2	197

High-Temperature Systems for Energy Conversion and Storage

Solid Oxide Fuel Cell: Recent Developments I	TUE	8:30 AM	Yacht & Beach	Grand Harbor Salon 1	146
High-Temperature Ceramic Materials: Response, Modelling and Performance	TUE	2:00 PM	Yacht & Beach	Grand Harbor Salon 1	172
Solid Oxide Fuel Cell: Recent Developments II	WED	8:30 AM	Yacht & Beach	Grand Harbor Salon 1	197
Innovation in Energy Conversion and Storage I	WED	2:00 PM	Yacht & Beach	Grand Harbor Salon 1	222
Innovation in Energy Conversion and Storage II	THU	8:30 AM	Yacht & Beach	Grand Harbor Salon 1	244

Hume-Rothery Award Symposium: Multicomponent Alloy Metallurgy, the Bridge from Materials Science to Materials Engineering

Thermodynamics	MON	8:30 AM	Dolphin	Oceanic 1	95
Solidification	MON	2:00 PM	Dolphin	Oceanic 1	119
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	268
Diffusion	TUE	8:30 AM	Dolphin	Oceanic 1	146
Solid State Transformations	TUE	2:00 PM	Dolphin	Oceanic 1	173

Integrative Materials Design II: Performance and Sustainability

Developments and Directions in Additive Manufacturing	MON	8:30 AM	Yacht & Beach	Grand Harbor Salon 8	95
Advanced Manufacturing Technologies: Processing, Structure, Properties, and Design	MON	2:00 PM	Yacht & Beach	Grand Harbor Salon 8	120
Design of Magnesium Alloys and Steels	TUE	8:30 AM	Yacht & Beach	Grand Harbor Salon 8	147
Sustainability in Design and Manufacturing	TUE	2:00 PM	Yacht & Beach	Grand Harbor Salon 8	173
Integrated Design for Fatigue and High Temperature Performance	WED	8:30 AM	Yacht & Beach	Grand Harbor Salon 8	197
Role of ICME in Design and Manufacturing	WED	2:00 PM	Yacht & Beach	Grand Harbor Salon 8	222
Advanced Materials Characterization and Modeling for Integrated Design	THU	8:30 AM	Yacht & Beach	Grand Harbor Salon 8	244
Linkages between Processing, Microstructure, and Performance	THU	8:30 AM	Yacht & Beach	Grand Harbor Salon 5	245

LMD 2015 Technical Division Student Poster Contest

LMD 2015 Student Poster Contest - Graduate	MON	3:30 PM	Dolphin	Atlantic Hall	269
LMD 2015 Student Poster Contest - Undergraduate	MON	3:30 PM	Dolphin	Atlantic Hall	269



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LI	MD 2015 Technical Division Young Professional Pos	ter Co	ntest			
	LMD 2015 Technical Division Young Professional Poster Contest	MON	6:30 PM	Dolphin	Atlantic Hall	269
Μ	agnesium Technology 2015					
	Keynote Session	MON	8:30 AM	Dolphin	Northern Hemisphere E1	95
	Elevated Temperature and Creep	MON	2:00 PM	Dolphin	Northern Hemisphere E1	120
	Primary, Sustainability, Recycling, and Processing	MON	2:00 PM	Dolphin	Northern Hemisphere E2	120
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	269
	Deformation I	TUE	8:30 AM	Dolphin	Northern Hemisphere E1	147
	Deformation II	TUE	2:00 PM	Dolphin	Northern Hemisphere E1	173
	Forming and Alloy Design	WED	8:30 AM	Dolphin	Northern Hemisphere E2	198
	Wrought	WED	8:30 AM	Dolphin	Northern Hemisphere E1	198
	Casting and Metal Matrix Composites	WED	2:00 PM	Dolphin	Northern Hemisphere E2	223
	Corrosion, Coatings, Fatigue, and Fracture	WED	2:00 PM	Dolphin	Northern Hemisphere E1	223
	Functional and Emerging Alloys	THU	8:30 AM	Dolphin	Northern Hemisphere E2	246
	Biomedical Applications	THU	8:30 AM	Dolphin	Northern Hemisphere E1	245
Μ	agnetic Materials for Energy Applications V					
	Magnetocaloric Materials I	MON	8:30 AM	Yacht & Beach	Grand Harbor Salon 7	96
	Permanent Magnets I	MON	2:00 PM	Yacht & Beach	Grand Harbor Salon 7	121
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	270
	Permanent Magnets II	TUE	8:30 AM	Yacht & Beach	Grand Harbor Salon 7	148
		T 115	0.00 PM	Yacht &	Grand Harbor	174

TUE

WED

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MON

2:00 PM

8:30 AM

2:00 PM

8:30 AM

Beach

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Materials and Fuels for the Current and Advanced Nuclear Reactors IV

Magnetocaloric Materials II

Soft Magnetic Materials I

Soft Magnetic Materials II

Fuels I

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224

96

Salon 7

Grand Harbor

Salon 7

Grand Harbor

Salon 7

Grand Harbor

Salon 6



		Day	Time	Building	Room	Page
	Fuels II	MON	2:00 PM	Yacht & Beach	Grand Harbor Salon 6	121
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	270
	Fuels III	TUE	8:30 AM	Yacht & Beach	Grand Harbor Salon 6	148
	Structural Materials I	TUE	2:00 PM	Yacht & Beach	Grand Harbor Salon 6	174
	Structural Materials II	WED	8:30 AM	Yacht & Beach	Grand Harbor Salon 6	199
	Structural Materials III	WED	2:00 PM	Yacht & Beach	Grand Harbor Salon 6	225
	General	WED	2:00 PM	Yacht & Beach	Grand Harbor Salon 2	224
	Structural Materials IV	THU	8:30 AM	Yacht & Beach	Grand Harbor Salon 6	246
	Modeling	THU	2:00 PM	Yacht & Beach	Grand Harbor Salon 6	252
M	aterials Processing Fundamentals					
	Extractive Materials Processing	MON	9:30 AM	Yacht & Beach	Grand Harbor Salon 3	96
	Casting, Solidification, and Steel Processing	MON	2:00 PM	Yacht & Beach	Grand Harbor Salon 3	122
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	271
	Materials Processing	TUE	8:30 AM	Yacht &	Grand Harbor	149

Messaging Research to a Broad Audience

Session I	WED	8:30 AM	Dolphin	Oceanic 1	200
Session II	WED	2:00 PM	Dolphin	Oceanic 1	225

Beach

Salon 3

MHD 2015: Nagy El-Kaddah Memorial Symposium on Magnetohydrodynamics (MHD) in Materials Processing

Electromagnetic Separation	MON	9:30 AM	Swan	Swan 2	97
Electromagnetic Containment	MON	2:00 PM	Swan	Swan 2	122
MHD in Industry	TUE	8:30 AM	Swan	Swan 2	149
MHD Flow	TUE	2:00 PM	Swan	Swan 2	175
Induction Heating and Melting	WED	8:30 AM	Swan	Swan 2	200

Micromechanics of Structurally Inhomogeneous Materials: An FMD Symposium in Honor of Armen Khachaturyan

Micromechanics of Ferroic Phase Transformations	MON	8:30 AM	Dolphin	Asia 3	97
Martensitic Transformations	MON	2:00 PM	Dolphin	Asia 3	123



TECHNICAL PROGRAM

		Day	Time	Building	Room	Page
	Grain Growth and Plasticity	TUE	8:30 AM	Dolphin	Asia 3	150
	Micromechanics of Functional Materials	TUE	2:00 PM	Dolphin	Asia 3	175
	Thermodynamics and Kinetics of Phase Transformations	WED	8:30 AM	Dolphin	Asia 3	200
Mi	crostructural Processes in Irradiated Materials					
	Reactor Pressure Vessel and Ferritic/Martensitic Alloys	MON	8:30 AM	Dolphin	Asia 1	97
	Ferritic/Martensitic Alloys	MON	2:00 PM	Dolphin	Asia 1	123
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	272
	Nanostructured Metallic Materials (ODS/NFA, Interfaces)	TUE	8:30 AM	Dolphin	Asia 1	150
	Austenitic, Ni-based, and Zr-based Alloys	TUE	2:00 PM	Dolphin	Asia 1	176
	Ceramics and Fuels (SiC, UO2, General Ceramics, and Metal Fuels)	WED	8:30 AM	Dolphin	Asia 1	201
	Fusion Materials (Tungsten and other Alloys)	WED	2:00 PM	Dolphin	Asia 1	226
	Novel Modeling, Methods, and Phenomena	THU	8:30 AM	Dolphin	Asia 1	246
Μ	PMD 2015 Technical Division Student Poster Conte	st				
	MPMD 2015 Student Poster Contest - Graduate	MON	3:30 PM	Dolphin	Atlantic Hall	273
	MPMD 2015 Student Poster Contest - Undergraduate	MON	3:30 PM	Dolphin	Atlantic Hall	273
М	PMD 2015 Technical Division Young Professional Po	oster C	Contest			
	MPMD 2015 Technical Division Young Professional Poster Contest	MON	6:30 PM	Dolphin	Atlantic Hall	273
M	ultiscale Microstructure, Mechanics and Prognosis	of Hig	h Tempe	rature Allo	ys	
	Characterization and Mechanical Properties	MON	8:30 AM	Dolphin	Oceanic 7	98
	Atomistic and Mesoscale Modeling	MON	2:00 PM	Dolphin	Oceanic 7	124
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	274
	Multiscale Modeling and Co-based Alloys	TUE	8:30 AM	Dolphin	Oceanic 7	151
	Processing and In Situ Characterization	TUE	2:00 PM	Dolphin	Oceanic 7	176
	Environmental Degradation, Coatings, and Mechanical Properties	WED	8:30 AM	Dolphin	Oceanic 7	201
	General	WED	2:00 PM	Dolphin	Europe 1	226
	Microstructure, Durability, and Other High Temperature Materials/Applications	WED	2:00 PM	Dolphin	Oceanic 7	227



PROGRAM AT-A-GLANCE

		Day	Time	Building	Room	Page
Na	ano- and Micro-mechanical Measurements in Harsh	Envir	onments			
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	274
	Micromechanical Testing of Irradiated Materials	TUE	2:00 PM	Dolphin	Oceanic 4	177
	Nanoindentation in Harsh Environments	WED	8:30 AM	Dolphin	Oceanic 4	202
	In-Situ Testing at Non-Ambient Conditions	WED	2:00 PM	Dolphin	Oceanic 4	227
	Small Scale Testing at Non-Ambient Temperature	THU	8:30 AM	Dolphin	Oceanic 4	247
Na	anocomposites III					
	Metal Nanocomposites I	MON	8:30 AM	Dolphin	Europe 2	99
	Polymer Nanocomposites I	MON	2:00 PM	Dolphin	Europe 2	124
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	274
	Ceramic or Metalloid (Si or C) Nanocomposites I	TUE	8:30 AM	Dolphin	Europe 2	151
	Multifunctional Nanocomposites I and Tailored Nanostructures	TUE	2:00 PM	Dolphin	Europe 2	177
	Multifunctional Nanocomposites II and Metal Nanocomposites II	WED	8:30 AM	Dolphin	Europe 2	202
	Metal Nanocomposites II	WED	2:00 PM	Dolphin	Europe 2	228
Na	anostructured Materials for Rechargeable Batteries	and fo	or Superc	apacitors	111	
	Session I: Advanced Battery Chemistries	MON	8:30 AM	Dolphin	Europe 3	99
	Session II: Supercapacitors	MON	2:00 PM	Dolphin	Europe 3	124
	Session III: In Situ TEM for Batteries	TUE	8:30 AM	Dolphin	Europe 3	151
	Session IV: Computational Methods and Advanced Batteries	TUE	2:00 PM	Dolphin	Europe 3	177
	Session V: Advanced Cathode and Anode Materials for Li-Ion Batteries	WED	8:30 AM	Dolphin	Europe 3	202
	Session VI: Advanced Topics in Batteries	WED	2:00 PM	Dolphin	Europe 5	228
	Session VII: Advanced Characterization and New Batteries	WED	2:00 PM	Dolphin	Europe 3	228
	Session VIII: Advanced Topics in Batteries and Capacitors	THU	8:30 AM	Dolphin	Europe 3	248
	Session IX: Batteries and Supercapacitors	THU	8:30 AM	Dolphin	Europe 5	247
Ne	eutron and X-Ray Studies of Advanced Materials VI	ll: Diffi	action Li	mit and B	eyond	
	Space and Time Resolved I	MON	8:30 AM	Swan	Pelican 1	99
	Space and Time Resolved II	MON	2:00 PM	Swan	Pelican 1	125

MON

6:30 PM

Dolphin

Atlantic Hall

274

Poster Session

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		Day	Time	Building	Room	Page
	Elastic and Inelastic Scattering	TUE	8:30 AM	Swan	Pelican 1	152
	Organic and Functional Materials	TUE	2:00 PM	Swan	Pelican 1	178
	Defects, Strains, Stress I	WED	8:30 AM	Swan	Pelican 1	203
	Diffraction at Nano- and Mesoscale	WED	8:30 AM	Swan	Macaw 1	203
	General Session	WED	2:00 PM	Swan	Macaw 1	229
	Defects, Strains, Stresses II	WED	2:00 PM	Swan	Pelican 1	229
Ne	ew Horizons for Mechanical Spectroscopy in Materi	als Sc	ience			
	RUS and Mechanical Spectroscopy in General	MON	8:30 AM	Swan	Macaw 1	100
	Dislocations, Crystals, Meta-Materials and Applications	MON	2:00 PM	Swan	Macaw 1	125
	Surfaces, Films and Interfaces and Nonlinear Acoustics	TUE	8:30 AM	Swan	Macaw 1	152
	Glasses, Models and Measurements	TUE	2:00 PM	Swan	Macaw 1	178
N	ovel Synthesis and Consolidation of Powder Materi	als				
	Cold Spray Forming, Metal Powders and Additive Manufacturing	MON	8:30 AM	Swan	Swan 10	100
	Novel Consolidation of Powder Materials	MON	2:00 PM	Swan	Swan 10	126
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	275
	Powder Metallurgy of Light Alloys (Ti, Al, Mg) and Composites I	TUE	8:30 AM	Swan	Swan 10	153
	Powder Metallurgy of Light Alloys (Ti, Al, Mg) and Composites II	TUE	2:00 PM	Swan	Swan 10	178
	Novel Fabrication of Ceramics	WED	8:30 AM	Swan	Swan 10	204
	Microstructure, Property and Applications of Novel PM Materials	WED	2:00 PM	Swan	Swan 10	230
	Powder Production, Processing and Sintered Properties	THU	8:30 AM	Swan	Swan 10	248
Pł	o-free Solders and Emerging Interconnect and Pack	aging				
	Fundamental Materials Behavior	MON	8:30 AM	Swan	Lark	101
	3D Microelectronic Packages	MON	2:00 PM	Swan	Lark	126
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	275
	Lead-Free Solder Reliability	TUE	8:30 AM	Swan	Lark	153
	Lead-Free IMC Formation and Mechanical Behavior	TUE	2:00 PM	Swan	Lark	179
	Novel Interconnect and Nano-Materials	WED	8:30 AM	Swan	Lark	204
	Electromigration and Thermomigration	WED	2:00 PM	Swan	Lark	230

TECHNICAL PROGRAM

www.tms.org/TMS2015



PROGRAM AT-A-GLANCE

		Day	Time	Building	Room	Page
	High Temperature Lead-Free Solder and Applications	THU	8:30 AM	Swan	Lark	249
Pł XI	ase Stability, Phase Transformations, and Reactive V	Phas	e Format	ion in Elec	tronic Mater	rials
	Session I	WED	8:30 AM	Swan	Parrot	204
	Session II	WED	2:00 PM	Swan	Parrot	231
	Session III	THU	8:30 AM	Swan	Parrot	149
Pł	ase Transformations and Microstructural Evolution	ו				
	Liquid-Solid Phase Transformations	MON	8:30 AM	Swan	Swan 3	102
	Iron Chromium Alloys I	MON	8:30 AM	Swan	Swan 1	101
	Crystallization and Diffusional Transformations	MON	2:00 PM	Swan	Swan 3	127
	Iron Chromium Alloys II	MON	2:00 PM	Swan	Swan 1	154
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	276
	Steels I	TUE	8:30 AM	Swan	Swan 3	154
	Understanding Phase Transformations using APT and Other Complimentary Techniques	TUE	2:00 PM	Swan	Swan 3	179
	Steels and Ferrous Alloys	WED	8:30 AM	Swan	Swan 3	205
	Shape Memory Alloys	WED	2:00 PM	Swan	Swan 2	231
	Steels II	WED	2:00 PM	Swan	Swan 3	232
	Thermal and Deformation Processing	THU	8:30 AM	Swan	Swan 3	250
	Titanium Alloys	THU	8:30 AM	Swan	Swan 2	250
Po	olycrystalline Materials: Bringing Together Experime	ents, S	Simulatio	ns, and An	alytic Theor	ies
	Session I	MON	8:30 AM	Dolphin	Oceanic 8	102
	Session II	MON	2:00 PM	Dolphin	Oceanic 8	127
	Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	276
	Session III	TUE	8:30 AM	Dolphin	Oceanic 8	154
	Session IV	TUE	2:00 PM	Dolphin	Oceanic 8	180

WED

WED

8:30 AM

2:00 PM

Dolphin

Dolphin

Oceanic 8

Oceanic 8

205

232

Session V

Session VI

PRO	GRAM	AT-A-	GLANCE



	Day	Time	Building	Room	Page
are Metal Extraction & Processing 2015					
Rare Metal Processes	MON	9:30 AM	Yacht & Beach	Asbury C	103
Precious Metals	MON	2:00 PM	Yacht & Beach	Asbury C	128
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	276
Rare Earth Metals	TUE	8:30 AM	Yacht & Beach	Asbury C	155
Vanadium-Molybdenum-Tungsten	TUE	2:00 PM	Yacht & Beach	Asbury C	180
Recent Developments in Biological, Structural and F	unctio	nal Thin I	Films and	Coatings	
Session I	MON	8:30 AM	Swan	Parrot	103
Session II	MON	2:00 PM	Swan	Parrot	128
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	276
Session III	TUE	8:30 AM	Swan	Parrot	155
Session IV	TUE	2:00 PM	Swan	Parrot	180
ecycling and Sustainability Update					
Waste	MON	9:30 AM	Yacht & Beach	Grand Harbor Salon 4	103
Recycling	MON	2:00 PM	Yacht & Beach	Grand Harbor Salon 4	129
Poster Session	MON	6:30 PM	Dolphin	Atlantic Hall	277
efractory Metals 2015				·	
Alloy Design, Application and Oxidation	MON	8:30 AM	Dolphin	Europe 1	104
Mechanical Properties, Structure & Processing	MON	2:00 PM	Dolphin	Europe 1	129
MD 2015 Technical Division Student Poster Contest					
SMD 2015 Student Poster Contest - Graduate	MON	3:30 PM	Dolphin	Atlantic Hall	277
SMD 2015 Student Poster Contest - Undergraduate	MON	3:30 PM	Dolphin	Atlantic Hall	277
MD 2015 Technical Division Young Professional Pos	ster Co	ontest			
SMD 2015 Technical Division Young Professional Poster Contest	MON	6:30 PM	Dolphin	Atlantic Hall	278
olar Cell Silicon					
Silicon Production and Refining	MON	8:30 AM	Yacht & Beach	Grand Harbor Salon 1	104
Crystallization and Mechanical Properties	MON	2:00 PM	Yacht &	Grand Harbor	130





	Day	Time	Building	Room	Page
Strip Casting of Light Metals					
Process Technology	TUE	8:30 AM	Dolphin	Northern Hemishere E2	156
Modeling and Properties	TUE	2:00 PM	Dolphin	Northern Hemishere E2	181
Structural Materials, Heat Transport Fluids, and Novel System Designs for High Power and Process H	leat G	eneration)		
Heat Transport Fluids I	MON	2:00 PM	Yacht & Beach	Asbury B	130
Heat Transport Fluids II	TUE	8:30 AM	Yacht & Beach	Asbury B	156
Sustainable Energy and Layered Double Hydroxides					
		1			

Sustainable Energy and Layered Double Hydroxides	MON	8:30 AM	Yacht & Beach	Asbury B	105	
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2015 Functional Nanomaterials: Energy and Sensing — Energy Conversion and Storage I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee

Program Organizers: Jung-Kun Lee, University of Pittsburgh; Behrang Hamadani, National Institute of Standards and Technology; Sung Hun Wee, HGST, a Western Digital Company; Nitin Chopra, University of Alabama, Tuscaloosa; Terry Xu, The University of North Carolina at Charlotte; Jang-Sik Lee, Pohang University of Science and Technology (POSTECH)

Monday AM	Room: Swan 4
March 16, 2015	Location: Swan

Session Chair: Jung-Kun Lee, University of Pittsburgh

8:30 AM Introductory Comments

8:35 AM Invited

Making Polycrystalline Thin Films of the Earth Abundant Solar Absorber ($Cu_2ZnSn(S_xSe_{1,x})_4$ from Colloidal Nanocrystal Dispersions: Boris Chernomordik¹; Nancy Trejo¹; Priyanka Ketkar¹; Anne Hunter¹; Amélie Béland¹; Donna Deng¹; *Eray Aydil*¹; ¹University of Minnesota

9:15 AM

Solar Energy Capture: Methods of Optimizing Nanofluid-Based Volumetric Solar Flow Receivers: Luqmaan Habib¹; Mohamed Hassan¹; Youssef Shatilla¹; ¹Masdar Institute of Science and Technology

9:35 AM Invited

Electron Energy Filtering for Energy Efficient Electronics: Seong Jin Koh¹; ¹University of Texas at Arlington

10:15 AM Break

10:30 AM Invited

All-metal Solar Energy Conversion Devices Based on Hot Electrons: *Jeremy Munday*¹; ¹University of Maryland

11:10 AM

In-Situ Localized Surface Plasmon Resonance (LSPR) Spectroscopy to Investigate Kinetics of Chemical

bath Deposition of CdS Thin Films: *Humaira Taz*¹; Rose Ruther²; Abhinav Malasi¹; Sagar Yadavali¹; Connor Carr¹; Jagjit Nanda²; Ramki Kalyanaraman¹; ¹University of Tennessee-Knoxville; ²Oak Ridge National Laboratory

11:30 AM Invited

Role of Disorder and Carrier Recombination in the Performance of CH₃NH₃PbI₃ Perovskite Films: Elbert Chia¹; ¹Nanyang Technological University

2015 Light Metals Keynote — Latest Developments in Smelting of Light Metals

Sponsored by:

Program Organizer: John Grandfield, Grandfield Technology Pty Ltd

Monday AM	Room: Southern Hemisphere I
March 16, 2015	Location: Dolphin

Session Chair: John Grandfield, Grandfield Technology Pty Ltd

8:30 AM Introductory Comments

8:40 AM Keynote

An Overview of Alternate Smelting Processes for Light Metals: James Metson¹; ¹University of Auckland

9:15 AM Keynote

The Advanced Research Projects Agency-Energy (ARPA-E) Light Metal Production Technology Programs: James Klausner¹; ¹US Department of Energy

9:40 AM Keynote Emerging Titanium Production Processes: Kathie McGregor¹; ¹CSIRO

10:00 AM Keynote

An Overview of Thermochemical Processes for Low Cost Production of Ti: Challenges and Opportunities: Zak Fang¹; ¹University of Utah

10:20 AM Break

10:35 AM Keynote

Carbothermic Reduction of ZnO, MgO, SiO₂, and Al₂O₃ Using Concentrated Solar Energy: *Aldo Steinfeld*¹; ¹ETH Zurich

10:55 AM Keynote

Carbothermal Production of Aluminium and Magnesium: Mark Cooksey¹; Leon Prentice¹; ¹CSIRO

11:15 AM Keynote

Balzano and Magnetherm Alternate Variants of Silicothermic Reduction of Magnesium to Pidgeon Process: James Sever¹; ¹Alpha/Omega Engineering

11:35 AM Keynote

Olivine as a Feedstock for Magnesium Electrolysis: The SilMag Project: *Per Bjorn Engseth*¹; ¹Silmag Production AS

11:55 AM Keynote

Towards Environment-Friendly Minerals Processing: A New Path for Alumina Production with CO₂ Utilization: Asuncion Aranda¹; ¹Institute for Energy Technology - IFE

12:15 PM Panel Discussion

6th International Symposium on High Temperature Metallurgical Processing — High Efficiency New Metallurgical Process and Technology

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Gerardo Alvear, Xstratatech; Onuralp Yucel, Istanbul Technical University; Xinping Mao, Wuhan Iron and Steel Corporation; Hong Yong Sohn, University of Utah; Naiyang Ma, ArcelorMittal; Phillip Mackey, P.J. Mackey Technology; Tom Battle, Midrex Technologies

Monday AM Room: Swan 5 March 16, 2015 Location: Swan

Session Chairs: Hong Yong Sohn, University of Utah; Tao Jiang, Central South University

9:30 AM

Advances in Products and Processes for Induction Heating: Lesley Frame¹; *Josef Gaster*¹; ¹Thermatool Corp.

9:50 AM

The Use of On-Site Oxygen Generation in the Production of Metals: Frank Vonesh¹; ¹PCI

10:10 AM Break

10:30 AM

Development of as Cast Structures of High-manganese Steel Grades Under Extra Slowly Solidification Conditions: *Bernhard Steenken*¹; Dieter Senk¹; Joao Rezende¹; Dennis Kuhlendahl¹; ¹RWTH Aachen

10:50 AM

Recovery of Iron from Hematite-Rich Diasporic-type Bauxite Ore: *Tao Jiang*¹; Zhuoxuan Li¹; Guanghui Li¹; Lin Yang¹; Yuanbo Zhang¹; Jinghua Zeng¹; ¹School of Minerals Processing and Bioengineering, Central South University

11:10 AM

Al Control in High Titanium Ferro with Low Oxygen Prepared by Thermite Reaction: *Dou Zhihe*¹; Wang Cong¹; Fan Shigang¹; Shi Guanyong¹; Zhang Ting'an¹; ¹Northeastern University



11:30 AM

Production of Green Steel from Red Mud: A Novel Concept: *Bhagyadhar Bhoi*¹; Pravas Ranjan Behera¹; Chitta Ranjan Mishra²; Barada Kanta Mishra¹; ¹Institute of Minerals and Materials Technology; ²National Aluminium Company Ltd.

11:50 AM

Production of ZrB₂-TiB₂ Ceramic Composite Powders by SHS: Mehmet Bugdayci¹; *Ayse Ece Yildizcelik*¹; Onuralp Yucel¹; ¹Istanbul Technical University

Additive Manufacturing: Interrelationships of Fabrication, Constitutive Relationships Targeting Performance, and Feedback to Process Control — Process Parameter Development in Additive

Manufacturing

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; David Bourell, University of Texas at Austin; Reginald Hamilton, Pennsylvania State University; James Sears, GE Global Research Center; Allison Beese, Pennsylvania State University; Rajiv Mishra, University of North Texas

Monday AM	Room: Northern Hemisphere A1
March 16, 2015	Location: Dolphin

Session Chairs: Edward D. Herderick, GE; Todd Palmer, Pennsylvania State University

8:30 AM Invited

Industrial Implementation of Additive Manufacturing: *Edward Herderick*¹; Clark Patterson²; ¹GE Corporate; ²Rapid prototype + manufacturing (rp+m)

9:00 AM

Effects of Process Parameters on Microstructure and Mechanical Properties of Inconel 718 Processed by Laser Engineered Net Shaping: *Jakub Toman*¹; Pu Zhang¹; Erica Stevens¹; Kevin Laux¹; Albert To¹; Markus Chmielus¹; ¹University of Pittsburgh

9:20 AM

Fabrication of Metal-Diamond-Composites by Selective Laser Melting: *Christian Leinebach*¹; Adriaan Spierings²; Christoph Kenel¹; Konrad Wegener³; ¹Empa-Swiss Federal Laboratories for Materials Science and Technology; ²Inspire AG; ³ETH Zurich

9:40 AM Invited

Additive Manufacturing of Strong and Ductile Ti-6Al-4V by Selective Laser Melting: Wei Xu¹; Milan Brandt¹; Shoujin Sun¹; *Ma Qian*¹; ¹RMIT University (Royal Melbourne Institute of Technology)

10:10 AM Break

10:30 AM Invited

Fundamental Processing-Structure-Property Relationships in Directed Energy Deposition of Nickel and Titanium Alloys: *Todd Palmer*¹; Jayme Keist¹; Allison Beese¹; ¹Pennsylvania State University

11:00 AM

Mechanical Properties of IN738LC Processed by Selective Laser Melting (SLM): *Thomas Etter*¹; Roman Engeli¹; Hossein Meidani¹; Felix Roerig¹; Fabian Geiger¹; Julius Schurb¹; ¹ALSTOM (Switzerland) Ltd

11:20 AM

84

Characterisation of Direct-laser Deposited IN 718: *Zewen Huang*¹; Rengen Ding¹; Ian Mitchell²; Gavin Baxter²; Paul Bowen¹; ¹The University of Birmingham; ²Rolls-Royce plc

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Deformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee *Program Organizers:* Rodney McCabe, Los Alamos National Laboratory; John Carpenter, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Khalid Hattar, Sandia National Laboratory; Irene Beyerlein, Los Alamos National Laboratory; Wolfgang Pantleon, Technical University of Denmark

Monday AM	Room: Pelican 2
March 16, 2015	Location: Swan

Funding support provided by: TMS: Materials Characterization Committee

TMS: Shaping and Forming Committee

Session Chairs: Marko Knezevic, University of New Hampshire; Gregory Thompson, University of Alabama

8:30 AM Invited

In-Situ Atomic-Scale Observation of Irradiation-Induced Void Formation and Growth: Weizong Xu¹; Yongfeng Zhang²; Paul Millett³; Carl Koch¹; Suveen Mathaudhu¹; *Yuntian Zhu¹*; ¹North Carolina State University; ²Idaho National Laboratory; ³University of Arkansas

9:00 AM Invited

Recent Developments in Miniaturized Fracture Testing in the SEM and TEM: *Daniel Kiener*¹; Ruth Treml¹; Darjan Kozic²; Ronald Schöngrundner²; Roland Brunner²; Eric Hintsala³; William Gerberich³; ¹University of Leoben; ²Materials Center Leoben; ³University of Minnesota

9:30 AM

Three-Dimensional, Before and After Study of Damage Nucleation in Ballistically-Shocked Copper Using nf-HEDM: David Menasche¹; Jon Lind²; Shiu Fai Li²; Christopher Hefferan³; Reeju Pokharel⁴; John Bingert⁴; Robert Suter¹; ¹Carnegie Mellon University; ²Lawrence Livermore National Laboratory; ³R.J. Lee Group; ⁴Los Alamos National Laboratory

9:50 AM

Lath Martensite Plasticity: A Micro-Strain Mapping Study Coupled to 3D Microstructure Characterization: *Lutz Morsdorf*¹; Dingshun Yan¹; Cem Tasan¹; Dirk Ponge¹; Dierk Raabe¹; ¹Max-Planck-Institut fuer Eisenforschung GmbH

10:10 AM Break

10:30 AM Invited

Novel Experimental Protocols for High Throughput Exploration of Structure-Processing-Property Relationships in Structural Metal Alloys Using a Combination of Indentation, Microscopy, and Finite Element Modeling Techniques: Surya Kalidindi¹; Jordan Weaver¹; Ali Khosravani¹; ¹Georgia Institute of Technology

11:00 AM Invited

Characterization in 3D by the New Tri Beam Tomography Approach: McLean Echlin¹; William Lenthe¹; *Tresa Pollock*¹; ¹University of California Santa Barbara

11:30 AM

High Throughput Femtosecond-Laser Machining of Micro-Tension Specimens: *Stephanie Slaughter*¹; Jonathon Ligda²; Tomoko Sano¹; Brian Schuster¹; ¹Army Research Laboratory; ²Oak Ridge Institute for Science and Education

11:50 AM

Microstructure Evolution in Polycrystalline Cu: Comparison Between nf-HEDM Observation and CPFFT Model: *Reeju Pokharel*¹; Ricardo Lebensohn¹; Robert Suter²; Anthony Rollett²; ¹Los Alamos National Laboratory; ²Carnegie Mellon University

Advanced Composites for Aerospace, Marine, and Land Applications II — Advanced Processing Techniques

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Tomoko Sano, US Army Research Laboratory; Tirumalai Srivatsan, The University of Akron

Monday AM March 16, 2015 Room: Asia 5 Location: Dolphin

Session Chairs: Sampath Vedamanickam, Indian Institute of Technology Madras; Tomoko Sano, US Army Research Laboratory

8:30 AM Invited

Effect of Processing Parameters on the Microstructure of Mechanically Alloyed Nanostructured Al-Mn Alloys: Kris Darling¹; Mark Tschopp¹; Laszlo Kecskes¹; ¹ARL

8:50 AM

Al-NiTi Metal Matrix Composites for Zero CTE Materials: Fabrication, Design, and Modeling: Adam Hehr¹; Xiang Chen¹; Joshua Pritchard¹; Marcelo Dapino¹; *Peter Anderson*¹; ¹The Ohio State University

9:10 AM

Characterization of the Interface of Co-Extruded Asymmetric Aluminum-Titanium Composite Profiles: Norbert Grittner¹; ¹Leibniz Universität Hannover Institut für Werkstoffkunde

9:30 AM

Fabrication and Characterization of Nb-Al Composites. Effect of Sintering Temperature: *Lucio Vazquez*¹; Juan Miranda¹; Elizabeth Garfias¹; Dulce Medina¹; ¹Universidad Autonoma Metropolitana

9:50 AM Break

10:10 AM

Carbon Nanotube Coated Conductors: *Terry Holesinger*¹; ¹Los Alamos National Laboratory

10:30 AM

Spark Plasma Sintering (SPS) of Carbon Nanotube (CNT)/Graphene Nanoplatelet (GNP)-Nickel Nanocomposites: Structure-Property Relationships: *Tushar Borkar*¹; Jun Yeon Hwang²; Jaimie Tiley³; Soon Hong⁴; Rajarshi Banerjee¹; ¹University of North Texas; ²Korea Institute of Science and Technology; ³Air-force Research laboratory; ⁴Korea Advanced Institute os Science and Technology

10:50 AM

Effect of in-situ TiB2 Particle Addition and Friction Stir Processing on Wear Behaviour of 2219 Al Alloy: *Sampath Vedamanickan*¹; Rajasekaran NR²; ¹Indian Institute of Technology Madras; ²Dhanalakshmi College of Engineering

Advanced Materials and Reservoir Engineering for Extreme Oil & Gas Environments II — Environmental Influences of Downhole Alloys and Advanced Materials for Oil and Gas Applications I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee *Program Organizers:* Indranil Roy, Schlumberger; Xinghang Zhang, Texas A&M University; Ting Chen, West Virginia University; Greg Kusinski, Chevron; Jefferson Rodrigues, Petrobras; Hani Elshahawi, Shell Exploration & Production, Co.

Monday AM March 16, 2015 Room: Swan 7 Location: Swan

Session Chairs: Indranil Roy, Schlumberger; Greg Kusinski, Chevron ETC

8:30 AM Introductory Comments Greg Kusinski and Indranil Roy

8:45 AM Keynote

Corrosion Resistant Alloys for High Pressure High Temperature Sour Environments: *Timothy Armstrong*¹; ¹Carpenter Technologies

9:10 AM Invited

Corrosion Characterization of Advanced High Interstitial Stainless Steels: *Brajendra Mishra*¹; Eunkyung Lee¹; ¹Colorado School of Mines

9:35 AM Invited

Synergistic Effects Between Localized Corrosion Resistance and Environmental Assisted Cracking of CrMn-Stainless Steel in Chloride-Containing Solutions: Helmuth Sarmiento Klapper¹; John Stevens¹; ¹Baker Hughes

10:00 AM Break

10:15 AM Invited

Pitting Corrosion and Corrosion Fatigue Crack Propagation of Oil-Grade Nickel-Base Alloy 718: Ting Chen¹; Jared Nutter¹; Naing Naing Aung¹; Jeffrey Hawk²; *Xingbo Liu*¹; ¹West Virginia University; ²National Energy Technology Laboratory

10:40 AM Invited

The Role of Grain Boundary Character in H-Assisted Intergranular Fracture: *Matteo Seita*¹; John Hanson¹; Silvija Gradecak¹; Michael Demkowicz¹; ¹Massachusetts Institute of Technology

11:05 AM

Hydrogen Embrittlement in Advanced Materials for Oil and Gas Industry: A Nanomechanical Approach: *Nousha Kheradmand*¹; Roy Johnsen¹; Afrooz Barnoush¹; ¹Norwegian University of Science and Technology

11:25 AM

Computational Simulation of the Hydrogen Diffusion and Prediction of Hydrogen Diffusivity in Clustered Nanocrystalline and Fine Grained Polycrystalline Nickel: *Sathiskumar Jothi*¹; Nick Croft¹; Stephen GR Brown¹; ¹Swansea University

11:45 AM

Material Factors Determining Sulfide Stress Cracking Susceptibility in Low-Alloy OCTG Steels: Fang Cao¹; *Srinivasan Rajagopalan*¹; Russell Mueller¹; Ning Ma¹; Weiji Huang²; Cecilie Haarseth²; ¹ExxonMobil Research and Engineering Company; ²ExxonMobil Development Company



Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion III — Introductory Session

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee, TMS: Magnetic Materials Committee

Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael Lanagan, Penn State University; Michael McHenry, Carnegie Mellon University; Rachael Myers-Ward, Naval Research Laboratory; Clive Randall, Penn State University; Matthew Willard, Case Western Reserve University; Ty McNutt, APEI, Inc.

Monday AMRoom: Asbury AMarch 16, 2015Location: Yacht & Beach

Session Chair: Paul Ohodnicki, National Energy Technology Laboratory, DOE

8:30 AM Introductory Comments

8:35 AM Keynote

HV Wide Bandgap Semiconductors Demand Materials Evolution: Geraldo Nojima¹; ¹Eaton Corporation

9:15 AM Invited

High Power Transformer Testing and Applications: John McCarthy¹; ¹Dynapower

9:45 AM Invited

Very High Voltage SiC Power Switches with Superior Energy Efficiency and Integrated SiC Drive Electronics: *Mikael Ostling*¹; ¹KTH

10:15 AM Break

10:35 AM Invited

Advanced III-V Technologies for RF Power Applications: Rajinder Sandhu¹; ¹Northrop Grumman Aerospace Systems

11:05 AM Invited

A Nanosilver Paste Technology for Pressure-free Bonding of Power Semiconductor Chips: Guo-Quan Lu¹; ¹Virginia Tech

11:35 AM Invited

Relationship Between Dielectric Performance and Electronic Structure of Poly (aryl ether ether ketone): Carlos Diaz¹; Marco Olguin¹; Janet Ho¹; ¹US Army Research Laboratory

Advanced Materials in Dental and Orthopedic Applications — Session I

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Elizabeth Trillo, Southwest Research Institue; Grant Crawford, South Dakota School of Mines and Technology

Monday AM	Room: Swan 8
March 16, 2015	Location: Swan

Session Chairs: Paulo Lisboa Filho, Sao Paulo State University-UNESP; Carlos Grandini, Sao Paulo State University-UNESP; Tolou Shokuhfar, Michigan Technological University

8:30 AM Keynote

Development of Ti-10Mo-Zr Alloys for Biomedical Applications: Raul Araújo¹; Marília Buzalaf²; *Carlos Grandini*¹; ¹UNESP - Univ. Estadual Paulista; ²USP - Univ. São Paulo

9:05 AM

Application of Bio-Degradable Polymers for Controlling Release Rate of Drug Eluting Implants: *Azhang Hamlekhan*¹; Cortino Sukotjo²; Mathew Mathew³; Christos Takoudis²; Tolou Shokuhfar¹; ¹Michigan Tech; ²University of Illinois at Chicago; ³Rush University Medical Center

9:25 AM Invited

Biological Interactions of Cathodically Polarized Titanium: *Mark Ehrensberger*¹; ¹University at Buffalo

9:55 AM

In Vitro Studies of Secondary Caries Formation and Strategies for Prevention: Jamie Kruzic¹; Dmitriy Khvostenko¹; Jack Ferracane²; Thomas Hilton²; John Mitchell³; ¹Oregon State University; ²Oregon Health & Science University; ³Midwestern University

10:15 AM Break

10:35 AM Keynote

Alkali-route Synthetized TiO₂ Nanotubes Used in Dental Composites: Larisa Arruda¹; Daniela Cibim²; Kamila Kantovitz²; Ana Sanches-Borges³; Maria Alves- Rezende⁴; Regina Puppin-Rontani²; *Paulo Lisboa-Filho*¹; ¹UNESP - Univ Estadual Paulista; Institute of Biomaterials, Tribocorrosion and Nanomedicine – Brazilian Branch; ²UNICAMP - University de Campinas; ³USP – Universidade de São Paulo; ⁴UNESP - Univ Estadual Paulista

11:10 AM

Bioresorbable Iron-Manganese for Orthopedic Applications – The Effect of Microstructure and Surface Morphology on Degradation Behavior: *Lia Stanciu*¹; Michael Heiden¹; David Johnson¹; ¹Purdue University

11:30 AM

Novel Fabrication of Transparent Titania Nanotubes on Zirconia Bio-Implant: *Sweetu Patel*¹; Natalie Wolfson²; Azhang Hamlekhan¹; Maria Runa³; Cortino Sukotjo²; Mathew Mathew³; Christos Takoudis²; Tolou Shokuhfar¹; ¹Michigan Technological University; ²University of Illinois at Chicago; ³Rush University Medical Center

Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu — Solidification Processing I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Laurentiu Nastac, The University of Alabama; Baicheng Liu, Tsinghua University; Hasse Fredriksson, KTH - Royal Institute of Technology; Jacques Lacaze, Université de Toulouse; Chun-Pyo Hong, Yonsei University; Adrian Catalina, Caterpillar Inc.; Andreas Buhrig-Polaczek, RWTH Aachen University; Daan Maijer, The University of British Columbia; Charles Monroe, University of Alabama at Birmingham; Adrian Sabau, Oak Ridge National Laboratory; Roxana Ruxanda, Emerson Climate Technologies; Alan Luo, The Ohio State University; Subhayu Sen, GEOCENT; Attila Diószegi, Jönköping University, School of Engineering

Monday AM	Room: Swan 6
March 16, 2015	Location: Swan

Session Chair: Adrian Sabau, Oak Ridge NL

8:30 AM Introductory Comments from Laurentiu Nastac

8:40 AM

Science of Casting and Solidification: ASM Handbook Contributions – Honoring Prof. Doru Michael Stefanescu: *Afina Lupulescu*¹; Scott Henry¹; Karen Marken¹; Steven Lampman¹; ¹ASM International

9:00 AM Invited

On the Solidification of Metal Alloys during Microgravity Conditions: *Hasse Fredriksson*¹; ¹KTH - Royal Institute of Technology

9:25 AM

Formation of the Tin Rich Layer and Inverse-Segregation in Phosphor Bronzes during Continuous Casting: Casting of Phosphorous Bronzes: Saud Saleem¹; Michael Vynnycky¹; Hasse Fredriksson¹; ¹The Royal Institute of Technology (KTH), Sweden

9:45 AM Invited

A Model of Cavitation for the Treatment of a Moving Liquid Metal Volume: Gerard Lebon¹; *Koulis Pericleous*¹; Iakovos Tzanakis²; Dmitry Eskin²; ¹University of Greenwich; ²Brunel University

10:10 AM Break Coffee break

10:40 AM

Ultrasonic Processing of 6061-Based Nanocomposites for High Performance Applications: *Shian Jia*¹; Laurentiu Nastac¹; ¹The University of Alabama

11:00 AM

Numerical Modeling of the Dispersion of Ceramic Nanoparticles during Ultrasonic Processing of A356-based Nanocomposites: Daojie Zhang¹; Laurentiu Nastac¹; ¹The University of Alabama

11:20 AM

Optical Floating-zone Crystal Growth of Heusler NI-MN-SN Alloy: *Jinke Yu*¹; Jian Ren¹; Hongwei Li¹; Hongxing Zheng¹; ¹Shanghai University

Advances in Thin Films for Electronics and Photonics — New Generation Photovoltaics and Solar Fuels

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee

Program Organizers: Federico Rosei, INRS; Nuggehalli Ravindra, New Jersey Institute of Technology; Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Terry Alford, Arizona State University

Monday AM	Room: Europe 7
March 16, 2015	Location: Dolphin

Session Chair: Oussama Moutanabbir, Ecole Polytechnique

8:30 AM Invited

Kinetically Optimized Quantum Dot Sensitized Solar Cells: Yasuhiro Tachibana'; 'RMIT University

9:00 AM Invited

Semiconducting Ferroelectric Perovskites for Photovoltaics: *Riad Nechache*¹; ¹Institut National de la Recherche Scientifique

9:30 AM Invited

Semiconductor and Plasmonic Nanostructures: Rational Design and their Applications in Solar Cells: *Dongling Ma*¹; ¹INRS, University of Quebec

10:00 AM Break

10:20 AM Invited

Solution Processed Organic/Inorganic Photovoltaics: *Christine Luscombe*¹; Katherine Mazzio¹; Trevor Martin¹; ¹University of Washington

10:45 AM Invited

Tailoring Optical and Electronic Properties of Wide Band Gap Materials: Benjamin Gaddy¹; Joshua Harris¹; Jonathon Baker¹; Zachary Bryan¹; Isaac Bryan¹; Edward Sachet¹; Jon-Paul Maria¹; Clive Randall²; Long-Qing Chen²; Elizabeth Dickey¹; Zlatko Sitar¹; Ramón Collazo¹; *Douglas Irving*¹; ¹North Carolina State University; ²Pennsylvania State University

11:10 AM Invited

Templated Growth of Highly Oriented Nanowires for Water Splitting: Wenting Hou¹; Sam Macartney²; Rong Liu²; Richard Wuhrer²; Leigh Sheppard²; *David Kisailus*¹; ¹University of California at Riverside; ²University of West Sydney

11:35 AM Invited

Wide Bandgap Oxide Semiconductors for High Efficiency Excitonic Solar Cells: Alberto Vomiero¹; ¹CNR-INO, Sensor Lab

Alloys and Compounds for Thermoelectric and Solar Cell Applications III — Session I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Stéphane Gorsse, Bordeaux INP; Chih-Huang Lai, National Tsing Hua University; Yoshisato Kimura, Tokyo Institute of Technology; Ce-Wen Nan, Tsinghua University; G. Jeffrey Snyder, California Institute of Technology; Hsin-jay Wu, National Sun Yat-Sen University

Monday AM	Room: Europe 5
March 16, 2015	Location: Dolphin

Session Chairs: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen

8:30 AM Introductory Comments

8:35 AM

Ν

Reconstruction Mechanisms at the CuInSe₂ and AgInSe₂ Polar Surfaces: A **First-Principles Study**: *Namhoon Kim*¹; Pamela Martin¹; Angus Rockett¹; Elif Ertekin¹; ¹University of Illinois

8:55 AM

Optical Parameters of Spray-Deposited CdS: In Thin Films: *Shadia Ikhmayies*¹; ¹Al Isra University

9:15 AM

Screening the Film Quality of Kesterite Absorber by X-ray Diffraction Method: *Xiaojing Hao*¹; ¹School of PV and Renewable Energy Engneering, UNSW

9:35 AM Invited

n Type Bi2Te3: Texturing, Copper Doping and MWCNT Inclusion: Franck Gascoin¹; ¹CRISMAT laboratory

10:00 AM Break

10:20 AM

Thickness Dependence of the Optical Parameters of Spray-Deposited SnO2:F Thin Films: Shadia Ikhmayies¹; ¹Al Isra University

10:40 AM

Effects of Tensile Stress on Thermoelectric Properties of Bi-Te Based Thin Films on Flexible Substrates: *Tzu-Tsan Shen*¹; Chien-Neng Liao¹; ¹National Tsing-Hua University, Hsinchu, Taiwan

11:00 AM

Oxidation Behavior of Thermoelectric SnSe at Elevated Temperature: *Yi Li*¹; Bin He¹; Ji-Cheng Zhao¹; Joseph Heremans¹; ¹The Ohio State University

Biological Materials Science Symposium — Multiscale Mechanics of Biological and Bioinspired Materials

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Kalpana Katti, North Dakota State University; Rajendra Kasinath, DePuy Synthes Products, LLC; Michael Porter, Clemson University; Francois Barthelat, McGill University

Monday AM March 16, 2015 Room: Swan 9 Location: Swan

Session Chairs: Kalpana Katti, North Dakota State University; Rajendra Kasinath, DePuy Synthes Products, LLC

8:30 AM Introductory Comments

8:35 AM Invited

Layered Water in Bone as Key for Its Strength, Creep, Permeability, and Mechano-Sensitivity: A Unified Theoretical Approach Integrating Experimental Data Across the Disciplines: *Christian Hellmich*¹; ¹Vienna University of Technology



9:05 AM Invited

Molecular Basis of Disease: Experiments and Modeling in Osteogenesis Imperfecta (OI) of Human Bone: *Dinesh Katti*¹; Kalpana Katti¹; Chunju Gu¹; Reza Parsa¹; ¹North Dakota State University

9:35 AM

Multiscale Modeling of the Directed Self-Assembly Process for Bacteriophage Virus: Chris Papamitrou¹; *Wayne Hodo*²; David McInnis²; Isayev Olexandr³; ¹JSNN; ²US Army ERDC; ³UNC-Chapel Hill

9:55 AM

Strain Rate Hardening: A Hidden but Critical Mechanism for Biological Composites?: Ravi Chintapalli¹; Stephanie Breton¹; Ahmad Khayer Dastjerdi¹; *Francois Barthelar*¹; ¹McGill University

10:15 AM Break

10:25 AM Invited

An Investigation into the Environment And Temperature Dependent Nanomechanical Properties of the Shallow Water Shrimp (PENAEUS SPP.) Exoskeleton: Devendra Verma¹; Vikas Tomar¹; ¹Purdue University

10:55 AM

Atomistic Modeling of Self-Organisation in the Complex Structure: *Helena Zapolsky*¹; Mykola Lavrsky¹; Armen Khachaturyan²; ¹University of Rouen; ²University of California and Rutgers University

11:15 AM

A Nanomechanics Based Investigation into Interface Thermomechanics of Collagen and Chitin Based Biomaterials: Tao Qu¹; Vikas Tomar¹; ¹Purdue University

11:35 AM

Thermodynamic and Mechanical Properties of Bamboo in Nano-Scale: Sina Youssefian¹; Nima Rahbar¹; ¹Worcester Polytechnic Institute

11:55 AM

Time Dependent Behavior of Human Dentin: Carolina Montoya Mesa¹; Alexander Ossa Henao¹; Dwayne Arola²; ¹Eafit University; ²University of Washington

Bulk Metallic Glasses XII — Alloy Development and Application I

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Hahn Choo, Univ of Tennessee; Yanfei Gao, University of Tennessee

Monday AM	Room: Asia 4
March 16, 2015	Location: Dolphin

Session Chairs: William Johnson, California Institute of Technology; Peter Liaw, The University of Tennessee

8:30 AM Keynote

Toward a Universal Description of Homogeneous Crystal Nucleation and Glass Forming Ability of Metallic Liquids: *William Johnson*¹; Jong Hyun Na²; Marios Demetriou¹; ¹California Institute of Technology; ²Glassimetal Technology Inc.

9:00 AM

A Combined Thermodynamic, Kinetic, and Topological Approach to the Discovery of High Glass Forming Alloys: *Sina Sedighi*¹; Steven Thorpe¹; Chandra Veer Singh¹; ¹University of Toronto

9:20 AM Invited

A Combinatorial Approach to Designing Metallic Glass Alloys: Peter Tsai¹; *Katharine Flores*¹; ¹Washington University

9:45 AM Invited

Amorphous Approximants as a Basis for Design of Bulk Metallic Glasses: Michael Widom¹; ¹Carnegie Mellon University

10:10 AM Break

10:25 AM Invited

Developing Structural Aerospace Applications for Bulk Metallic Glasses: Alloy Design, Processing, Prototyping and Experimentation: *Douglas Hofmann*¹; Scott Roberts¹; ¹NASA JPL/Caltech

10:45 AM Invited

Electromagnetic Forming of Metallic Glasses: *Marios Demetriou*¹; Georg Kaltenboeck²; William Johnson²; ¹Glassimetal Technology; ²California Institute of Technology

11:05 AM Invited

Metallic Glass Reinforced Metal Matrix Composites: *Konstantinos Georgarakis*¹; Alain Yavari²; Koji Nakayama¹; Yoshihiko Yokoyama¹; ¹Tohoku University; ²Institut Polytechnique (INP) de Grenoble

11:25 AM Invited

Superelastic Bulk Metallic Glass Composites: Wook Ha Ryu¹; Hyun Seok Oh¹; Hye Jung Chang²; Wan Chuck Woo³; *Eun Soo Park*¹; ¹Seoul National University; ²Korea Institute of Science and Technology; ³Korea Atomic Energy Research Institute

11:45 AM Invited

Characterization of Bulk Metallic Glasses via Fast Differential Scanning Calorimetry: *Stefan Pogatscher*¹; Peter Uggowitzer¹; Jörg Löffler¹; ¹ETH Zurich

CALPHAD-Based ICME Research for Materials Genomic Design — CALPHAD, ICME, and Materials Genome

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Wei Xiong, Northwestern University; Shihkang Lin, National Cheng Kung University; Chao Jiang, Thermo-Calc Software Inc; Shenyang Hu, Pacific Northwest National Laboratory; Wen-dung Hsu, National Cheng Kung University; Sinn-wen Chen, National Tsinghua University; Shuanglin Chen, CompuTherm LLC

Monday AM	Room: Northern Hemisphere A2
March 16, 2015	Location: Dolphin

Session Chairs: Wei Xiong, Northwestern University; Chao Jiang, Thermo-Calc Software Inc; Shih-kang Lin, National Cheng Kung University; Qing Chen, Thermo-Calc Software AB; Ricardo Komai, Northwestern University

8:30 AM Keynote

Integrated Computational Materials Design: From Genome to Flight: Greg Olson¹; ¹Northwestern University

9:00 AM Keynote

The Role of CALPHAD in ICME and Materials Genome: John Agren¹; ¹Royal Institute of Technology

9:30 AM

Diffusion "Kerf" Couples for Materials Genomics Data: *Nagraj Kulkarni*¹; Robert Warmack²; Irina Belova³; Graeme Murch³; ¹Knoxville, TN; ²Oak Ridge National Laboratory; ³The University of Newcastle

9:50 AM Break

10:05 AM Keynote

Recent Development of Phase Equilibria Calculations by CVM: Tetsuo Mohri¹; ¹Tohoku University

10:35 AM Invited

Materials Genomic Design of Novel Alloys with CALPHAD Tools: *Jiadong* Gong¹; David Snyder¹; Jason Sebastian¹; Greg Olson¹; ¹QuesTek Innovations

11:00 AM

CALPHAD-based Alloy Design: Application to Advanced Steels: *Raymundo Arroyave*¹; Shengyen Li²; Chung Wang¹; Ruben Villarreal¹; Taymaz Jozaghi¹; Ibrahim Karaman¹; ¹Texas A & M University; ²National Institute of Standards and Technology

11:20 AM

CALPHAD Approach Used in Novel application to Martensitic Transformations in Biological Systems: *Ricardo Komai*¹; Gregory Olson¹; ¹Northwestern University

Characterization of Materials through High Resolution Coherent Imaging — Coherent Imaging

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Ross Harder, Argonne National Lab; Richard Sandberg, Los Alamos National Laboratory; Brian Abbey, La Trobe University; Xianghui Xiao, Argonne National Laboratory; John Carpenter, Los Alamos National Laboratory

Monday AM	Room: Macaw 2	
March 16, 2015	Location: Swan	

Session Chair: Xiaojing Huang, Brookhaven National Laboratory

8:30 AM Keynote

A Perfect Storm: Nanoscale Imaging of Materials with Coherent X-rays: Ian McNulty¹; ¹Argonne National Laboratory

9:00 AM

In Situ Nano-Mechanical Testing in Combination with Coherent Bragg X-Ray Diffraction Imaging: *Thomas Cornelius*¹; C. Leclere¹; Z. Ren¹; A. Davydok¹; Stephane Labat¹; M.-I. Richard¹; Olivier Thomas¹; ¹Aix-Marseille Université

9:20 AM

Coherent X-ray Diffractive Imaging for Materials Characterization: Possibilities and Challenges: Yuriy Chushkin¹; Federico Zontone¹; Benoit Maillot¹; Giuseppe Faraci²; ¹European Synchrotron Radiation Facility; ²Università di Catania

9:40 AM

Determination of the Phase Domain Distribution in Single Semiconductor Nanowires by Means of Coherent Diffraction Imaging: *Ullrich Pietsch*¹; Arman Davtyan¹; Otmar Loffeld¹; ¹University of Siegen

10:00 AM Break

10:20 AM Invited

Bragg Coherent Diffraction Imaging of Dynamics at the Nano- and Meso-Scale: *Jesse Clark*¹; ¹Stanford University

10:40 AM Invited

Coherent Imaging in Reflection and Transmission Modes Near the Wavelength Limit Using Tabletop High Harmonics: *Matthew Seaberg*¹; Daniel Adams¹; Bosheng Zhang¹; Dennis Gardner¹; Elisabeth Shanblatt¹; Henry Kapteyn¹; Margaret Murnane¹; ¹JILA, University of Colorado at Boulder

11:00 AM

Coherent Diffractive Imaging Applied to Materials Characterisation at Multiple Lengthscales: *Brian Abbey*¹; ¹La Trobe University

11:20 AM

Magnetic Memory in Ferromagnetic CoPd IrMn Films Studied by Coherent X-ray Magnetic Scattering Correlation Spectroscopy: Karine Chesnel¹; ¹BYU

11:40 AM Invited

High-Resolution Quantitative Imaging of Functional Materials with Coherent X-ray Diffraction Microscopy: *Huaidong Jiang*¹; Jiadong Fan¹; Zhibin Sun¹; Jian Zhang¹; ¹Shandong University

Characterization of Minerals, Metals, and Materials — Characterization of Ferrous Metals

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee Program Organizers: John Carpenter, Los Alamos National

Laboratory; Chenguang Bai, Chongqing University; Juan Pablo Escobedo, University of New South Wales; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Neves Monteiro, Military Institute of Engineering, IME, Materials Science Department; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal; Jian Li, CanmetMATERIALS

Monday AM March 16, 2015 Room: Mockingbird 1 Location: Swan

Session Chairs: Tonya Stone, Mississippi State University; Jim Hwang, Michigan Tech

8:30 AM

Structure-Property Relationships during Processing of Cold Drawn Steel Tubing: *Tonya Stone*¹; Charles Sullivan¹; Robert Zelinka²; ¹Mississippi State University; ²Plymouth Tube Company

8:50 AM

Investigation of Temperature Effects on the Tensile Deformation Characteristics of a Quenched and Partitioned Steel Using Digital Image Correlation: Jun Hu¹; *Fadi Abu-Farha*¹; Louis Hector, Jr.²; Jody Hall²; ¹Clemson University; ²General Motors

9:10 AM

Analysis of the Sensitization of Grain Boundary Engineered Stainless Steel by EBSD and In Situ TEM: Matthew Hartshorne¹; Christopher Barr¹; Mitra Taheri¹; ¹Drexel University

9:30 AM

Creep Behavior Investigation of P92 Steel by Small Punch Creep Testing: *Gauri Deshmukh*¹; M Prasad¹; D Peshwe¹; J Ganesh Kumar²; M Mathew³; ¹VNIT, Nagpur; ²Indira Gandhi Centre for Atomic Research, Kalpakkam ; ³Indira Gandhi Centre for Atomic Research, Kalpakkam

9:50 AM Break

10:00 AM

Characterization of Nitronic 30, 40 and 50 Series Stainless Steels and Correlation of Their Microstructure to Their Properties: Costas Fountzoulas¹; Eric Klier¹; James Catalano¹; ¹U.S. Army Research Laboratory

10:20 AM

Characterization of DP980 Steel by 2-Point Correlation Function and Relation to Mechanical Properties: *Fan Zhang*¹; David Field¹; Annie Ruimi²; Pui Ching Wo¹; ¹Washington State University; ²Texas A&M University at Qatar

10:40 AM

High-resolution Imaging and Quantification of Boron Segregation to Austenite Grain Boundaries in High-Strength Steels Using Combined NanoSIMS/EBSD Analysis: *Hanis Ayuni Mohd Yusof*¹; Katie Moore¹; Chris Grovenor¹; ¹University of Oxford

11:00 AM

Study of Age Hardening Behavior in a 350 Grade Maraging Steel: *Leandro Gomes de Carvalho*¹; Ronald Lesley Plaut¹; Marcelo de Aquino Martorano¹; Angelo Fernando Padilha¹; ¹Escola Politécnica da Universidade de São Paulo

Characterization of Nuclear Reactor Materials and Fuels with Neutron and Synchrotron Radiation — Session I

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Jonathan Almer, Argonne National Laboratory; Meimei Li, Argonne National Laboratory; Donald Brown, Los Alamos National Laboratory; Tiangan Lian, Electric Power Research Institute

Monday AM	Room: Grand Harbor Salon 5
March 16, 2015	Location: Yacht & Beach

Session Chair: Jonathan Almer, Argonne National Laboratory

8:30 AM Introductory Comments

8:35 AM Invited

Measurements of H Solubility in Zirconium: *Mark Daymond*¹; Oksana Simane¹; Eric Tulk²; ¹Queen's University; ²Kinectrics Inc

9:05 AM

Temperature and Grain Size Dependent Deformation Mechanisms of Ultrafine Grained Austenitic Stainless Steel Studied by In Situ Neutron Diffraction: C. Sun¹; D. Brown¹; S. Maloy¹; K. Hartwig²; X. Zhang²; ¹Los Alamos National Laboratory; ²Texas A&M University

9:25 AM

Characterization of Ion Beam Irradiated 304 Stainless Steel Utilizing Nanoindentation and Laue Microdiffraction: *Amanda Lupinacci*¹; Kai Chen¹; Martin Kunz¹; Ashley Reichardt¹; Hi Vo¹; Manuel Abad¹; Andrew Minor¹; Peter Hosemann¹; ¹University of California, Berkeley

9:45 AM

Characterization of Neutron-Irradiated HT-UPS Steel by High-Energy X-ray Diffraction Microscopy: Meimei Li¹; *Xuan Zhang*¹; Jun-Sang Park¹; Jonathan Almer¹; ¹Argonne National Lab

10:05 AM Break

10:20 AM

In-Situ Studies of Dislocation Structure Evolution during Annealing of Neutron Irradiated Zr-2.5Nb Alloy: *Levente Balogh*¹; Donald Brown²; Bjorn Clausen²; Fei Long¹; Paula Mosbrucker³; Thomas Sisneros²; Mark Daymond¹; ¹Queen's University; ²Los Alamos National Laboratory; ³Kinectrics Inc.

10:40 AM

Synchrotron Radiation Study on 14YWT and MA957 Nanostructured Ferritic Alloys: *Kun Mo*¹; Di Yun¹; Jun-Li Lin²; Yinbin Miao²; David Hoelzer³; Jonathan Almer¹; Huijuan Zhao⁴; Abdellatif Yacout¹; ¹Argonne National Laboratory; ²University of Illinois at Urbana-Champaign; ³Oak Ridge National Laboratory; ⁴Clemson University

11:00 AM

Characterization of Swift Heavy Ion Induced Effects in Nuclear Materials with Neutron and Synchrotron Radiation: *Maik Lang*¹; Cameron Tracy²; Raul Palomares¹; Jacob Shamblin¹; Christina Trautmann³; Rodney Ewing⁴; ¹University of Tennessee; ²University of Michigan; ³GSI Helmholtz Centre for Heavy Ion Research; ⁴Stanford University

11:20 AM

Strain Induced Phase Transformation in a Zirconium Alloy Investigated Using Synchrotron and Neutron Radiation: *Christopher Cochrane*¹; Mark Daymond¹; ¹Queen's University

11:40 AM

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Characterization of Nano-Precipitates in Irradiated RPV Steels: A Critical Comparison of SANS and APT Techniques: *Peter Wells*¹; Takuya Yamamoto¹; G. Odette¹; ¹UC Santa Barbara

12:00 PM Concluding Comments

During this period, poster presenters will be given a chance to briefly describe their work.

Computational Modeling and Stochastic Methods for Materials Discovery and Properties — Empirical Potentials

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Dallas Trinkle, University of Illinois at Urbana-Champaign; Mikhail Mendelev, Ames Laboratory; Adri van Duin, Pennsylvania State University

Monday AM March 16, 2015 Room: Northern Hemisphere A4 Location: Dolphin

Session Chairs: Hanchen Huang, Northeastern University; Mikhail Mendelev, Ames Laboratory

8:30 AM Invited

Response Embedded Atom Method of Interatomic Potentials: *Hanchen Huang*¹; ¹Northeastern University

9:00 AM

Computationally Efficient Method to Generate Multi-Component EAM Potentials: David Riegner¹; Logan Ward²; Wolfgang Windl¹; ¹The Ohio State University; ²Northwestern University

9:20 AM

Development of Semi-Empirical Potentials Suitable for Simulation of Solidification in Al-Sm Alloys: *Mikhail Mendelev*¹; Seth Wilsom¹; Feng Zhang¹; Matthew Kramer¹; Cai-Zhuang Wang¹; Kai-Ming Ho¹; ¹Ames Laboratory

9:40 AM Invited

Monte Carlo Methods for Free Energy Calculations: Y. Mishin¹; ¹George Mason University

10:10 AM Break

10:25 AM

Development of a New Angular-Dependent Interatomic Potential for the Cu-Ta System and Applications to the Design of Immiscible Nano-Crystalline Alloys: *Ganga Purja Pun*¹; K. Darling²; L. Kecskes²; Y. Mishin¹; ¹George Mason University; ²US Army Research Laboratory

10:45 AM

Atomistic Modeling Study of the Role of Oxygen Interstitials in the Behavior of Titanium Alloys: *William Joost*¹; Sreeramamurthy Ankem¹; Maija Kuklja¹; ¹University of Maryland

11:05 AM

Application and Validation of Inter-Atomic Potentials for Modeling Helium-3 Bubble Growth in Aging Palladium Tritides: Jonathan Zimmerman¹; Lucas Hale¹; ¹Sandia National Laboratories

11:25 AM

A Variable Charge Reactive Potential for Cyanogens for Organic-Metal Nitrides Interactions: *Jackelyn Martinez*¹; Dundar Yilmaz¹; Tao Liang¹; Susan Sinnott¹; Simon Phillpot¹; ¹University of Florida

11:45 AM

Computational Nanomechanics of Single-Chain Molecular Bond Rupture in Hydrocarbon-Based Polymers Using Modified Embedded-Atom Method Potential: Sasan Nouranian¹; Steven Gwaltney¹; Michael Baskes¹; Mark Tschopp¹; Mark Horstemeyer¹; ¹Mississippi State University

12:05 PM

Towards a Fully Automated Framework for Generation and Optimization of Empirical Potentials: *H. Metin Aktulga*¹; Bernd Hartke²; ¹Michigan State University; ²Christian-Albrechts-University Kiel

12:25 PM

An Interatomic Potential for Ionic+Covalent+Metallic Materials Based on the Modified Embedded-Atom Method: Eunkoo Lee¹; Kwang-Ryeol Lee²; *Byeong-Joo Lee*¹; ¹Pohang University of Science and Technology; ²KIST

Computational Thermodynamics and Kinetics — Diffusion and Defect Dynamics

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Maryam Ghazisaeidi, The Ohio-State University; Vidvuds Ozolins, University of California Los Angeles

Monday AM	Room: Oceanic 3
March 16, 2015	Location: Dolphin

Session Chair: Danny Perez, Los Alamos National Laboratory

8:30 AM

A DFT Study of Impurity Diffusion in bcc-Iron: Casper Versteylen¹; Marcel Sluiter¹; ¹TU Delft

8:50 AM

Establishment of Mg Diffusivity Database Using Diffusion-Multiple and CALPHAD Approaches: *Wei Zhong*¹; Weihua Sun¹; Ji-Cheng Zhao¹; Alan Luo¹; ¹The Ohio State University

9:10 AM

First Principles Study of the Charge Effect on Vacancy Diffusion Barriers in Alumina: *Yinkai Lei*¹; Guofeng Wang¹; ¹University of Pittsburgh

9:30 AM

Adaptive C Content in Coherently Strained \954-Carbides – An Ab-Initio Explanation of Atom Probe Tomography Data: *Poulumi Dey*¹; Roman Nazarov²; Martin Friák³; Mengji Yao¹; Tilmann Hickel¹; Jörg Neugebauer¹; ¹Max-Planck-Institut für Eisenforschung GmbH; ²Lawrence Livermore National Laboratory; ³Institute of Physics of Materials, v.v.i., Academy of Sciences of the Czech Republic

9:50 AM Break

10:10 AM

Analysis of the Stability and Diffusion of Individual Vacancies Using the Vacancy Phase-Field Crystal Model: *David Montiel*¹; Katsuyo Thornton¹; ¹University of Michigan

10:30 AM

Solute Cluster and Vacancy Interaction in Multicomponent Al Alloys: Dongwon Shin¹; ¹Oak Ridge National Laboratory

10:50 AM Invited

Evolution of Defects Near a Dislocation: Solutes and Vacancies in Nickel: *Dallas Trinkle*¹; Zebo Li¹; Thomas Garnier¹; Venkateswara Manga²; Maylise Nastar³; Pascal Bellon¹; Robert Averback¹; ¹University of Illinois, Urbana-Champaign; ²University of Arizona; ³CEA, DEN, Service de Recherches de Métallurgie Physique

11:20 AM

The Thermodynamics of Cottrell Atmospheres: John Cahn¹; Yuri Mishin²; ¹NIST; ²George Mason University

Constitutive Response and Modeling of Structural Materials: An SMD Symposium in Honor of G.T. Gray III's 60th Birthday — Microstructure Evolution and Constitutive Response I

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Neil Bourne, University of Manchester; Eric Brown, Los Alamos National Laboratory; James Williams, Ohio State University; Kenneth Vecchio, University of California San Diego

Monday AM March 16, 2015 Room: Asia 2 Location: Dolphin

Session Chairs: Eric Brown, Los Alamos National Laboratory; Neil Bourne, University of Manchester

8:30 AM Invited

Understanding the Microstructure in Shocked Solids: *Yogendra Gupta*¹; ¹Washington State University

8:50 AM Invited

Micromechanics of Solid-Solid Phase Transformations under Dynamic Conditions: *Frank Addessio*¹; Curt Bronkhorst¹; Turab Lookamn¹; Donald Brown¹; Ellen Cerreta¹; Paulo Rigg¹; ¹Los Alamos National Laboratory

9:10 AM Invited

Identifying Deformation Induced Porosity Mechanisms in Polycrystalline Metallic Materials: *Curt Bronkhorst*¹; Neil Bourne²; George Gray¹; Francis Addessio¹; Veronica Livescu¹; Ellen Cerreta¹; Milan Ardeljan³; Marko Knezevic³; ¹Los Alamos National Laboratory; ²The University of Manchester; ³University of New Hampshire

9:30 AM

A Continuum Dislocation Dynamics Model for Single Crystals: *Ioannis Mastorakos*¹; Hussein Zbib²; ¹Clarkson University; ²Washington State University

9:50 AM

Mechanical Behavior and Characterization of Single Crystal Titanium Deformed by Split Hopkinson Pressure Bar: *Benjamin Morrow*¹; Ricardo Lebensohn¹; Carl Trujillo¹; Francis Addessio¹; Curt Bronkhorst¹; Turab Lookman¹; Ellen Cerreta¹; ¹Los Alamos National Laboratory

10:10 AM Break

10:30 AM

Microstructure-Sensitive Modeling of Void Nucleation in Single-Phase Polycrystalline Materials: *Evan Lieberman*¹; Anthony Rollett¹; Edward Kober²; Ricardo Lebensohn²; ¹Carnegie Mellon University; ²Los Alamos National Laboratory

10:50 AM Invited

Crystal Plasticity Analysis of Constitutive Behavior of 5754 Aluminum Sheet: *Minh-Son Pham*¹; Anthony Rollett²; Adam Creuziger¹; Mark Iadicola¹; Tim Foecke¹; ¹NIST; ²Carnegie Mellon University

11:10 AM

Effects of Coupled Shear and Compression Upon Slip and Twinning in Dynamically Loaded Ta: Insights from the Atomistic Scale: *Timothy Germann*¹; Ramon Ravelo²; Brad Holian¹; ¹Los Alamos National Laboratory; ²University of Texas El Paso

11:30 AM

A Dislocation Dynamics Model of the Plastic Flow of fcc Polycrystals: *Abigail Hunter*¹; Dean Preston¹; ¹Los Alamos National Laboratory

11:50 AM

Incorporating Interface Affected Zones into Crystal Plasticity: Jason Mayeur¹; Irene Beyerlein¹; Curt Bronkhorst¹; ¹Los Alamos National Laboratory

12:10 PM

Local Stress Associated with Twin Propagation and Transmission in Mg: *M. Arul Kumar*¹; Irene Beyerlein¹; Carlos Tome¹; ¹Los Alamos National Laboratory

www.tms.org/TMS2015

12:30 PM Cancelled

Temperature Effects on the Thermo-Mechanical Response of Textured Alpha Uranium: Christopher Calhoun¹; Elena Garlea²; Thomas Sisneros³; Don Brown³; Sean Agnew¹; ¹University of Virginia; ²Y-12 Security Complex; ³Los Alamos National Laboratory

Development of "Weak Links" during the Processing of Metallic Materials — Overview

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee Program Organizers: Lee Semiatin, US Air Force Research

Laboratory; Anthony Rollett, Carnegie Mellon University; Thomas Bieler, Michigan State University; Mark Stoudt, National Institute of Standards and Technology

Monday AM	Room: Peacock
March 16, 2015	Location: Swan

Session Chairs: Lee Semiatin, US Air Force Research Laboratory; Mark Stoudt, NIST

8:30 AM Introductory Comments

8:45 AM Keynote

Limiting Features in Wrought Aerospace Alloys: David Furrer¹; A Haynes¹; Vasisht Venkatesh; 1Pratt & Whitney

9:15 AM Invited

Cavitation during the Hot Working of Alpha/Beta Titanium Alloys: P.D. Nicolaou1; R.L. Goetz2; T.R. Bieler3; S.L. Semiatin4; 1Bibliosynergatiki SA; ²Rolls-Royce Corp; ³Michigan State University; ⁴Air Force Research Laboratory

9:45 AM Invited

When the Infrequent Dominate Microstructure in Hot Forming: Eric Taleff1; 1The University of Texas at Austin

10:15 AM Break

10:30 AM Invited

Modeling of Ductile Fracture for Cold Working Processes: Howard Kuhn¹; ¹University of Pittsburgh

11:00 AM Invited

Recent Advances in Process and Material Modeling Applications: Ravi Shankar1; Wei-Tsu Wu1; Masoud Anahid1; Jixi Zhang1; 1Scientific Forming Technologies Corporation

11:30 AM Invited

The Potential Role for Impulse and High Velocity in Manufacturing: Glenn Daehn¹; Anupam Vivek¹; Ryan Brune¹; Bert Liu¹; Steven Hansen¹; ¹Ohio State University

12:00 PM Invited

Overcoming Challenges in Damage Engineering: Design of Reliable Damage Quantification Methodologies and Damage-Resistant Microstructures: Cem Tasan1; Dingshun Yan1; Johan Hoefnagels1; Dierk Raabe1; 1Max-Planck Institute for Iron Research

Dynamic Probing of Microstructure Evolution in Nanostructured Materials — Dynamic Probing Technique

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee Program Organizers: Nan Li, Los Alamos National Laboratory; Caizhi Zhou, Missouri University of Science and Technology, Dan Gianola, University of Pennsylvania; Marc Legros, CEMES-CNRS

Monday AM March 16, 2015

Room: Mockingbird 2 Location: Swan

Session Chairs: Nan Li, Los Alamos National Laboratory; Marc Legros, CEMES-CNRS

8:30 AM Introductory Comments

8:35 AM Invited

Modeling Characterization and of Transformation-Induced Microstructure Evolution in NiTi Microcrystals: Michael Mills1; Matthew Bowers¹; Xiang Chen¹; Yipeng Gao¹; Yunzhi Wang¹; Peter Anderson¹; ¹The Ohio State University

9:05 AM Invited

In Situ TEM Characterization of Dislocation Nucleation and Multiplication Mechanisms: Nan Li¹; Jian Wang¹; X.-Y. Liu¹; Richard Hoagland¹; Amit Misra2; 1Los Alamos National Laboratory; 2University of Michigan

9:35 AM Invited

Local and Transient Strain Mapping during In-Situ Deformation in a TEM: Christoph Gammer¹; Josh Kacher¹; Jim Ciston²; Cory Czarnik³; Oden Warren4; Andrew Minor1; 1UC Berkeley and LBL; 2LBL; 3Gatan, Inc.; ⁴Hysitron, Inc.

10:05 AM Break

10:25 AM Invited

Quantitative In-Situ ACOM-STEM Analysis of Nanocrystalline Metals during Mechanical Straining and Heating: Christian Kuebel1; Aaron Kobler1; Krishna Kanth1; Horst Hahn1; 1KIT

10:55 AM

In Situ TEM Experiments and MD Simulations of Grain Boundary Mediated Plasticity: Marc Legros¹; Armin Rajabzadeh¹; Frédéric Mompiou¹; Nicolas Combe1; Dmitri Molodov2; Sylvie Lartigue-Korinek3; 1CEMES-CNRS; 2RWTH Aachen University; 3Institut de Chimie et des Matériaux Paris-Est

11:15 AM Invited

Continuous Stiffness Testing - How Dynamic Indentation Testing Influences the Mechanical Properties: Verena Maier¹; Daniel Schwerwitzel²; Reinhard Pippan¹; Daniel Kiener²; ¹Erich-Schmid Institute for Materials Science; ²Montanuniversität Leoben

11:45 AM

In Situ Observations of Deformation Mechanisms in Nanocrystalline Metals: Paul Rottmann1; Kevin Hemker1; 1Johns Hopkins University

EPD Distinguished Lecture

Sponsored by: TMS Extraction and Processing Division

Monday AM March 16, 2015

Room: Grand Harbor Salon 2 Location: Yacht & Beach

Session Chair: Mark E. Schlesinger, Missouri University of Science and Technology

8:30 AM Introductory Comments

8:35 AM Invited Green Technology for Metals Production: Uday Pal1; 1Boston University

9:15 AM Concluding Comments

Fatigue in Materials: Fundamentals, Multiscale Modeling, Life Prediction and Prevention — Understanding Microstructural 3-D Effects and Fatigue Mechanism

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Antonios Kontsos, Drexel University

Monday AM	Room: Australia 3
March 16, 2015	Location: Dolphin

Session Chairs: Tongguang Zhai, University of Kentucky; Antonios Kontsos, Drexel University

8:30 AM Introductory Comments

8:35 AM Keynote

3D Characterization and Modeling of Fatigue Cracks: *Robert Suter*¹; Anthony Rollett¹; ¹Carnegie Mellon University

9:10 AM Invited

A Microstructure-Based Model for Simulating Short Fatigue Crack Growth Behaviors in 3-D: *Tongguang Zhai*¹; Wei Wen¹; Pei Cai¹; ¹University of Kentucky

9:35 AM Invited

2D vs 3D Analysis of LCF Short Cracks Initiated within Non Metallic Inclusions in an Inconel 718 Superalloy: *Damien Texier*¹; McLean Echlin²; Ana Casanova Gomez³; Patrick Villechaise⁴; Jonathan Cormier⁴; Stéphane Pierret⁵; Tresa Pollock²; ¹Institut Pprime - UCSB; ²UCSB; ³University of Cambridge; ⁴Institut Pprime, CNRS – ENSMA – Université de Poitiers; ⁵Snecma – SAFRAN Group

9:55 AM Invited

3-D Concurrent Multiscale Modeling of Microstructurally Small Fatigue-Crack Evolution in an Aluminum Alloy from Synchrotron-Based Measurements: *Ashley Spear*¹; Jacob Hochhalter²; Shiu Fai Li³; Jonathan Lind³; Robert Suter⁴; Anthony Ingraffea⁵; ¹University of Utah; ²NASA Langley Research Center; ³Lawrence Livermore National Laboratory; ⁴Carnegie Mellon University; ⁵Cornell University

10:15 AM Break

10:35 AM

3-D Effects of Constituent Particles on Fatigue Crack Initiation in High Strength Aluminum Alloys by FIB: *Yan Jin*¹; Tongguang Zhai¹; Pei Cai¹; Wei Wen¹; Lin Yang¹; Dongjie Ke²; ¹University of Kentucky; ²Metal-New Aluminum Technology Limited

10:55 AM Invited

Understanding Twinning-Detwinning Activity in Magnesium Alloys: Antonios Kontsos¹; Kavan Hazeli²; Mike Cabal¹; Jefferson Cuadra¹; Brian Wisner¹; Prashanth Vanniamparambil¹; ¹Drexel University; ²Johns Hopkins University

11:20 AM

Study of Fatigue Crack Nucleation Mechanisms Using High Resolution Electron Backscatter Diffraction and Digital Image Correlation: Jun Jiang¹; T. Britton¹; Fionn Dunne¹; ¹Imperial College London

11:40 AM Invited

Cyclic-loading Induced Lattice-Strain Asymmetry in Loading and Transverse Directions: *E-Wen Huang*¹; Jhen-Yi Huang¹; Rozaliya Barabash²; ¹National Chiao Tung University; ²Oak Ridge National Laboratory

Friction Stir Welding and Processing VIII — High Temperature Materials I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Rajiv Mishra, University of North Texas; Murray Mahoney, retired from Rockwell Scientific; Yutaka Sato, Tohoku University; Yuri Hovanski, Pacific Northwest National Laboratory

Monday AM March 16, 2015 Room: Northern Hemisphere A3 Location: Dolphin

Session Chairs: Yutaka Sato, Tohoku University; Tracy Nelson, Brigham Young University

8:30 AM Keynote

Tool Life for Different cBN Tool Materials Associated with Friction Stir Welding of A516 Grade 70 Steel: Murray Mahoney¹; *Russell Steel*²; Jon Babb²; Chris Tucker²; Dale Fleck²; ¹Retired from Rockwell Scientific; ²MegaStir

9:10 AM Invited

A Study of Friction Stir Welding for Clad Pipelines: *Tsubasa Katayama*¹; ¹Nippon Steel & Sumikin Engineering co., ltd.

9:30 AM Invited

Defect Tolerance Investigation of Friction Stir Welded DH36 Steel: *Athanasios Toumpis*¹; Alexander Galloway¹; Ryan Stevenson¹; Stephen Cater²; ¹University of Strathclyde; ²TWI

9:50 AM

Friction Stir Welding of Creep Strength Enhanced Ferritic Steels for Power Plant Applications: *Jens Darsell*¹; David Catalini¹; Yuri Hovanski¹; Glenn Grant¹; ¹Pacific Northwest National Laboratory

10:10 AM Break

10:30 AM

Fatigue Assessment of Friction Stir Welded DH36 Steel: Athanasios Toumpis¹; Alexander Galloway¹; Helena Polezhayeva²; Lars Molter³; ¹University of Strathclyde; ²Lloyd's Register; ³Center of Maritime Technologies

10:50 AM Invited

Friction Stir Welding of Induction Motor Components for Increased Efficiency in Electric Vehicles Applications: *Glenn Grant*¹; David Catalini¹; Blair Carlson²; Robert Szymanski²; John Agapiou²; ¹Pacific Northwest National Laboratory; ²General Motors Research and Development

11:10 AM

Friction Stir Welding of Invar 36: Murray Mahoney¹; *Russell Steel*²; Dale Fleck²; ¹Retired from Rockwell Scientific; ²MegaStir

11:30 AM

Use of High-Power Diode Laser Arrays for Pre- and Post-Weld Heating during Friction Stir Welding of Steels: *Brad Baker*¹; Terry McNelley¹; Manyalibo Matthews²; Mark Rotter²; Alexander Rubenchik²; Sheldon Wu²; ¹Naval Postgraduate School; ²Lawrence Livermore National Laboratory

11:50 AM

Residual Stress Study in Underwater Friction Stir Welded 304L Steel Joint: Xinghua Yu¹; Dongxiao Qiao¹; Wei Tang¹; Ke An¹; Zhili Feng¹; ¹Oak Ridge National Laboratory

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Fundamental Methods for Integrating Microstructure-Property-Design Relationships into the ICME Paradigm — Microstructure Characterization and Representation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee Program Organizers: Christopher Woodward, Air Force Research Laboratory, Somnath Ghosh, Johns Hopkins University

Monday AM	Room: Oceanic 2
March 16, 2015	Location: Dolphin

Session Chairs: Michael Groeber, Air Force Research Laboratory; Christopher Woodward, Air Force Research Laboratory

8:30 AM Invited

3D Characterization of Twin Boundaries and Their Role in Fatigue Crack Initiation: McLean Echlin¹; William Lenthe¹; Tresa Pollock¹; Jean-Charles Stinville1; 1University of California Santa Barbara

9:00 AM

An Image Based Finite Element Model for Ni-Based Superalloys Using a Two Scale Constitutive Model: George Weber¹; Chris Woodward²; Dennis Dimiduk²; Somnath Ghosh¹; ¹Johns Hopkins University; ²Air Force Research Laboratory

9:20 AM Invited

Mining Emergent Material Behavior from Measurements at the Mesoscale: Joel Bernier¹; S.F. Li; Paul Shade; Todd Turner; ¹Lawrence Livermore National Laboratory

9:50 AM

Coupled High Resolution Experiments and Crystal Plasticity Simulations to Analyze Stress and Strain Partitioning in Multi-Phase Alloys: Cem Tasan¹; Martin Diehl¹; Dingshun Yan¹; Christoph Zambaldi¹; Pratheek Shanthraj1; Franz Roters1; Dierk Raabe1; 1Max-Planck Institute for Iron Research

10:10 AM Break

10:30 AM Invited

Creating a Digital Environment for Representing Microstructure: Common Tools for Enabling ICME: Michael Groeber1; Michael Uchic; Dennis Dimiduk; Michael Jackson; ¹AFRL

11:00 AM

Generation of Synthetic FRP Microstructures Based on Experimentally **Observed Microstructures**: Seyed Hamid Reza Sanei¹; Ray Fertig¹; ¹University of Wyoming

11:20 AM Invited

Microstructure Informatics for Mining Structure-Property-Processing Linkages from Large Datasets: Surva Kalidindi¹; Ahmet Cecen¹; ¹Georgia Institute of Technology

High-Performance Aerospace Alloys Design Using ICME Approach — Session I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee Program Organizers: Awadh Pandey, Pratt & Whitney ; Somnath Ghosh, Johns Hopkins University; Dongsheng Li, Pratt & Whitney

Monday AM	Room: Oceanic 6
March 16, 2015	Location: Dolphin

Session Chair: Awadh Pandey, Pratt & Whitney

8:30 AM Keynote

Accelerated Discovery and Development of Multi-Principle Element Alloys Via ICME: Dan Miracle1; Oleg Senkov1; Jon Miller1; Christopher Woodward1; 1AF Research Laboratory

9:15 AM

Challenges and Approaches Using ICME in Turbine Engine Alloy Design: Dongsheng Li1; Vasisht Venkatesh1; Awadh Pandey1; 1Pratt & Whitney

9:35 AM

Atomistic Observations of Near Crack Plasticity Mechanisms in Precipitation Hardened Alloys: Thomas Berton¹; Chandra Veer Singh¹; ¹University of Toronto

9:55 AM Break

10:15 AM Invited

Modeling Fatigue Crack Nucleation in Polycrystalline Ti Alloys Using Crystal Plasticity FE Models: Somnath Ghosh1; Ahmad Shaba1; Adam Pilchak²; ¹Johns Hopkins University; ²AFRL/RX

10:45 AM

Effect of Boron Addition on Microstructure and Property of Low Cost Beta Titanium Alloy: Cheng-Lin Li¹; Yang Yu¹; Wen-Jun Ye¹; Song-Xiao Hui1; Xu-jun Mi1; 1General Research Institute for Nonferrous Metals

11:05 AM

Emerging Titanium Technologies and Opportunities for Powder Metallurgy Applications: Curt Lavender1; Vineet Joshi1; 1Battelle - Pacific Northwest National Laboratory

11:25 AM

Progress in Structure-Property Modeling Tools for \947-TiAl: Kyle Brindley1; Richard Neu1; 1Georgia Institute of Technology

High-Temperature Electrochemistry II — Molten Salt Technology

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee Program Organizers: Prabhat Tripathy, Idaho National Laboratory; Guy Fredrickson, Idaho National Lab

Monday AM	Room: Grand Harbor Salon 2
March 16, 2015	Location: Yacht & Beach

Session Chairs: Jerome Downey, Montana Tech of the Univ of Montana; Steven Herrmann, Idaho National Laboratory

9:30 AM

A Method for Improving Faradaic Efficiency of Magnesium Production Employing Solid Oxide Membrane (SOM) Based Electrochemical Cells: Uday Pal1; Xiaofei Guan1; Shizhao Su1; 1Boston University

10:10 AM Break

10:30 AM

Electrochemical Preparation of Nano-Materials in High Temperature Molten Salts: Dihua Wang1; Wei Xiao1; Huayi Yin1; 1Wuhan University

11:10 AM

Fabrication of Carbon Film on Stainless Steel in the Molten Salt: Qian Xu¹; Qiushi Song1; Zhiqiang Ning1; 1Northeastern University

11:50 AM

Studies on the Purification of Na3AlF6-K2SiF6-AlF3 Melts: Zhongliang Tian¹; Shu Yang¹; Yanging Lai¹; Xun Hu¹; Jie Li¹; ¹Central South University

Hume-Rothery Award Symposium: Multicomponent Alloy Metallurgy, the Bridge from Materials Science to Materials Engineering — Thermodynamics

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee

Program Organizers: Ursula Kattner, National Institute of Standards and Technology; Mark Asta, University of California at Berkeley; Raymundo Arroyave, Texas A&M University

Monday AM March 16, 2015

Room: Oceanic 1 15 Location: Dolphin

Session Chairs: Mark Asta, University of California at Berkeley; Anton Van der Ven, University of California at Santa Barbara

8:30 AM Invited

Solidification of Multicomponent Alloys: William Boettinger¹; ¹NIST

9:00 AM Invited

The Open Quantum Materials Database (OQMD): Multicomponent Ground State Equilibria and Accuracy of DFT Formation Energies: *Chris Wolverton*¹; Scott Kirklin¹; James Saal¹; Bryce Meredig¹; Alex Thompson¹; Jeff Doak¹; ¹Northwestern University

9:30 AM Invited

Cluster Expansions for Thermodynamics and Kinetics of Multicomponent Mixtures on Fixed Lattices: Marcel Sluiter¹; Jayashree Pan¹; ¹TU Delft

10:00 AM Break

10:30 AM Invited Development of Interatomic Potentials For Multi-component Systems: *Michael Baskes*¹; ¹Mississippi State University, Los Alamos National Laboratory, University of California San Diego, and University of North Texas

11:00 AM Invited

Constitution of Calphad Multicomponent Databases: *Nathalie Dupin*¹; ¹Calcul Thermodynamique

11:30 AM Invited

Is Alloy Thermodynamics Still a Matter of Principles?: Patrice Turchi¹; Aurelien Perron¹; Alexander Landa¹; Per Söderlind¹; ¹Lawrence Livermore National Laboratory

Integrative Materials Design II: Performance and Sustainability — Developments and Directions in Additive Manufacturing

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Materials and Society Committee

Program Organizers: Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Labs; Michael Sangid, Purdue University; Weizhou Li, Caterpillar Inc

Monday AM	Room: Grand Harbor Salon 8
March 16, 2015	Location: Yacht & Beach

Session Chairs: Diana Lados, Worcester Polytechnic Institute; Karen Taminger, NASA Langley Research Center

8:30 AM Invited

Additive Manufacturing at GE Aviation: Changing the Way We Do Business: David Abbott¹; ¹GE Aviation

8:55 AM Invited

Additive Manufacturing of Large Polymer Matrix Composite Systems: *William Peter*¹; Chad Duty¹; Lonnie Love¹; Brian Post¹; Rachel Smith¹; Peter Lloyd¹; Randy Lind¹; James Earle¹; Orlando Rios¹; Vlastimil Kunc¹; ¹Oak Ridge National Laboratory

9:20 AM Invited

Demonstration of Texture Control through Additive Manufacturing: *Ryan Dehoff*¹; Michael Kirka¹; W.J. Sames¹; F.A. List¹; M.J. Goin¹; M.T. Pearce¹; Kinga Unocic¹; S.S. Babu¹; ¹Oak Ridge National Laboratory

9:45 AM Invited

EBF3 Design and Sustainability Considerations: *Karen Taminger*¹; ¹NASA Langley Research Center

10:10 AM Break

10:30 AM

Microstructure Evolution, Tensile Properties, and Fatigue Damage Mechanisms in Ti-6Al-4V Alloys Fabricated by Two Additive Manufacturing Techniques: Yuwei Zhai¹; *Haize Galarraga*¹; Diana Lados¹; ¹Worcester Polytechnic Institute

10:50 AM Invited

Large Scale Additive Manufacturing of Aerospace Components: Brian Thompson¹; ¹GKN Aerospace

11:15 AM Invited

Additive Manufacturing and Architected Materials: Christopher Spadaccini¹; ¹Lawrence Livermore National Laboratory

11:40 AM

Design of Manufacturable Material Architectures Using Topology Optimization: Seunghyun Ha¹; Josephine Carstensen¹; *James Guest*¹; ¹Johns Hopkins University

Magnesium Technology 2015 — Keynote Session Sponsored by: TMS Light Metals Division, TMS: Magnesium

Committee

Program Organizers: Michele Manuel, University of Florida; Martyn Alderman, Magnesium Elektron; Alok Singh, National Institute for Materials Science; Neale Neelameggham, Ind LLC

Monday AM March 16, 2015 Room: Northern Hemisphere E1 Location: Dolphin

Session Chairs: Michele Manuel, University of Florida; Alok Singh, National Institute for Materials Science (NIMS)

8:30 AM Introductory Comments

Magnesium Technology Symposium Overview and Awards

8:50 AM Keynote

Reducing Weight for Transportation Applications: Technology Challenges and Opportunities: *Alan Taub*¹; ¹University of Michigan

9:30 AM Keynote

The Application of Magnesium Alloys in Aircraft Interiors- Changing the Rules: Bruce Davis¹; ¹Magnesium Elektron North America

9:50 AM Break

10:10 AM Invited

Emerging Science and Research Opportunities for Metals and Metallic Nanostructures: A Report on the NSF MMN Workshop: *Tresa Pollock*¹; Carol Handwerker²; ¹University of California Santa Barbara; ²Purdue University

10:30 AM Invited

Solute Segregation and Aggregation in Mg Alloys: *Jian-Feng Nie*¹; Yuman Zhu¹; Nick Wilson²; ¹Monash University; ²CSIRO Manufacturing Flagship

10:50 AM Panel Discussion

Magnetic Materials for Energy Applications V — Magnetocaloric Materials I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Magnetic Materials Committee

Program Organizers: Francis Johnson, GE Global Research; Raju Ramanujan, Nanyang Technological University; Paul Ohodnicki, National Energy Technology Laboratory

Monday AM March 16, 2015 Room: Grand Harbor Salon 7 Location: Yacht & Beach

Session Chairs: Frank Johnson, GE Global Research; Victorino Franco, University of Seville

8:30 AM Invited

Development of Magnetocaloric Materials for Magnetic Refrigeration Technology: Akiko Satio¹; Shiori Kaji¹; Tadahiko Kobayashi¹; ¹Toshiba Corporation

9:00 AM Invited

Recent Results on Transition Metal Based Magnetocaloric Materials: *Ekkes Brück*¹; ¹Delft University of Technology

9:30 AM

Mn Rich Meta Magnetic Shape Memory Alloys: *Jose Manuel Barandiaran*¹; Volodymyr Chernenko¹; Patricia Lazpita¹; Merivan Sasmaz²; ¹BCMaterials and UPV/EHU; ²Firat University

9:50 AM Break

10:05 AM Invited

DRREAM: Reducing Rare Earth Use in Applications of Magnetocalorics: *Karl Sandeman*¹; ¹City University of New York and Imperial College London

10:35 AM

Low Cost, High Performance Magnetocaloric Nanomaterials: *Raju Ramanujan*¹; X. Chen¹; V. Chaudhary¹; D.V.M. Repaka¹; ¹Nanyang Technological University

Materials and Fuels for the Current and Advanced Nuclear Reactors IV — Fuels I

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory

Monday AMRoom: Grand Harbor Salon 6March 16, 2015Location: Yacht & Beach

Session Chair: Ramprashad Prabhakaran, Pacific Northwest National Laboratory

8:30 AM

Thermal Conductivity of U-Mo Fuel as a Function of Burnup: *Douglas Burkes*¹; Andrew Casella¹; Edgar Buck¹; Amanda Casella¹; Matthew Edwards¹; Paul MacFarlan¹; Karl Pool¹; Frances Smith¹; Franciska Steen¹; ¹Pacific Northwest National Laboratory

8:50 AM

A Formed Can Approach to Hot Isostatically Press-Bonding Aluminum Cladding to Monolithic Uranium-10 wt. pct. Molybdenum Fuel Plates: *Kester Clarke*¹; Laura Tucker¹; Joel Montalvo¹; Jeffrey Scott¹; Beverly Aikin¹; Victor Vargas¹; Matthew Dvornak¹; Cheng Liu¹; Manuel Lovato¹; Richard Hudson¹; Donald Bucholz¹; Matthew Strandy¹; David Dombrowski¹; ¹Los Alamos National Laboratory

9:10 AM

Alternative Approaches for the Zr Coating of Low Enrichment U-10Mo High Performance Research Reactor Fuel: *Curt Lavender*¹; Ayoub Soulami¹; Vineet Joshi¹; Doug Burkes¹; Dean Paxton¹; Greg Coffey¹; ¹Battelle - Pacific Northwest National Laboratory

9:30 AM

Microstructures Observed in U-Mo Dispersion Fuel with Magnesium Matrix: *Dennis Keiser*¹; Jan-Fong Jue¹; Jian Gan¹; Brandon Miller¹; Adam Robinson¹; Pavel Medvedev¹; ¹Idaho National Laboratory

9:50 AM

Diffusional interactions in U-Mo vs. AA6061 Diffusion Couples Annealed at 600° and 550°C: *E. Perez*¹; D.D. Keiser, Jr.¹; Y.H. Sohn²; ¹Idaho National Laboratory; ²University of Central Florida

10:10 AM Break

10:30 AM

Evolution of Phase Constituents and Microstructure in Hot Isostatic Pressed Monolithic U-Mo Fuel Plates in AA6061 Cladding with Zr Diffusion Barrier: *Youngjoo Park*¹; Nicholas Eriksson¹; Dennis Keiser²; Yongho Sohn¹; ¹University of Central Florida; ²Idaho National Laboratory

10:50 AM

Evolution of Phase Constituents and Microstructure in the U-10wt.%Mo Alloy with Various Zr Additions after Heat Treatment at 900, 650, and 560°C: Nicholas Eriksson¹; Youngjoo Park¹; Dennis Keiser²; Yongho Sohn¹; ¹University of Central Florida; ²Idaho National Laboratory

11:10 AM

As Fabricated Microstructures of Diffusion Barriers on U-Mo Dispersion Particles in Al-Matrix: *E. Perez*¹; D.D. Keiser, Jr.¹; A. Leenaers²; S. Van den Berghe²; T. Wiencek³; ¹Idaho National Laboratory; ²Centre de l'Energie Nucléaire (SCK CEN); ³Argonne National Laboratory

11:30 AM

Interdiffusion and Reaction between U-Mo and Zr at 650°C as a Function of Time: *Youngjoo Park*¹; Dennis Keiser²; Yongho Sohn¹; ¹University of Central Florida; ²Idaho National Laboratory

Materials Processing Fundamentals — Extractive Materials Processing

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: James Yurko, Materion Brush Beryllium and Composites; Antoine Allanore, Massachusetts Institute of Technology; Lifeng Zhang, University of Science and Technology Beijing; Jonghyun Lee, University of Massachusetts; Laura Bartlett, Texas State University

Monday AM March 16, 2015 Room: Grand Harbor Salon 3 Location: Yacht & Beach

Session Chair: Antoine Allanore, Massachusetts Institute of Technology

9:30 AM

Arsenic and Antimony Removal from Copper Concentrates by Digestion with NaHS-NaOH: Maria Ruiz¹; Felipe Daroch¹; Rafael Padilla¹; ¹University of Concepcion

9:50 AM

Carbon-Free Solid Oxide Membrane Based Electrolysis Process for Direct Production of Solar Grade Silicon from Silica: *Yihong Jiang*¹; Shizhao Su¹; Xiao Han¹; Uday Pal¹; Soumendra Basu¹; ¹Boston University

10:10 AM Break

10:25 AM

Effect of Ni on the Synthesize of Boron Carbide via Aerosol Method: Celaletdin Ergun¹; Beril Ozcelik¹; ¹Istanbul Technical University

10:45 AM

Rate of Metal Deposition from Aqueous Solutions: Anne-Marie Suriano¹; Stanley Howard¹; ¹South Dakota School of Mines and Technology

11:05 AM

Electrochemical Studies On Reduction of Cobalt Tetrafluoroborate in 1-butyl-3-Methylimidazolium Tetrafluoroborate Ionic Liquids: *Min Li*¹; Zhaowen Wang²; Ramana Reddy¹; ¹The University of Alabama; ²Northeastern University

11:25 AM

Extracting Alumina from Coal Fly Ash with Concentrated Sulfuric Acid Sintering and Ultrasound Aided Leaching: *Wenbo Luo*¹; Jilai Xue¹; Jun Zhu¹; Kang Liu¹; Chunlei Yang¹; Fusheng Mao¹; ¹University of Science and Technology Beijing

MHD 2015: Nagy El-Kaddah Memorial Symposium on Magnetohydrodynamics (MHD) in Materials Processing — Electromagnetic Separation

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Ramana Reddy, The University of Alabama; Thinium Natarajan, U. S. Steel

Monday AM	Room: Swan 2
March 16, 2015	Location: Swan

Session Chairs: David Robertson, Missouri University of Science & Technology; Dahlia Kasperski, University of Alabama

9:30 AM Introductory Comments

9:35 AM Invited

Remembrance of Life Time Academic Achievements of Professor Nagy El-Kaddah: Thinium Natarajan¹; *Ramana Reddy*²; David Robertson³; ¹U. S. Steel; ²The University of Alabama; ³Missouri University of Science and Technology

9:50 AM Invited

Impact of Coil Geometry on Magneto-Hydro-Dynamic Flow in Liquid and Its Relevance to Inclusion Separation by Electromagnetophoresis: *Mark Kennedy*¹; Jon Bakken²; Ragnhild Aune²; ¹Proval Partners SA; ²NTNU

10:15 AM Break

10:30 AM Invited

Online Electromagnetic Filtration of Molten Aluminum Using a Multistage Separator System: *Da Shu*¹; Jun Wang¹; Baode Sun¹; ¹Shanghai Jiao Tong University

10:55 AM Invited

Prediction of Inclusions Distribution in a Steel Continuous Casting Slab Cast with FC-Mold: *Lifeng Zhang*¹; Qiangqiang Wang¹; ¹University of Science and Technology Beijing

11:20 AM Invited

Application of Electromagnetic Stirring in Continuous Casting for the Production of High Quality Steel: *Takashi Sawai*¹; Hiroshi Harada¹; Takehiko Toh¹; ¹Nippon Steel & Sumitomo Metal Corporation

11:45 AM Invited

Recent LIMMCAST Results on Modelling of Steel Casting: *Gunter Gerbeth*¹; Sven Eckert¹; Klaus Timmel¹; ¹Helmholtz-Zentrum Dresden-Rossendorf

Micromechanics of Structurally Inhomogeneous Materials: An FMD Symposium in Honor of Armen Khachaturyan — Micromechanics of Ferroic Phase Transformations

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee *Program Organizers:* Long Qing Chen, Penn State University; Mark Asta, University of California, Berkeley; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yongmei Jin, Michigan Technological University; Yann Le Bouar, LEM, CNRS/ ONERA

Monday AMRoom: Asia 3March 16, 2015Location: Dolphin

Session Chair: Long-Qing Chen, Penn State University

8:30 AM Introductory Comments

8:40 AM Invited

Phase Field: Prediction of Structure and Properties of Complex Nano- and Atomic Scale Structures: Armen Khachaturyan¹; ¹University of California Berkeley

9:20 AM Invited

Martensitic Transformation Precursor: 3D Phonon Diffuse Scattering Experiments: Yu Wang¹; Yongmei Jin¹; Yang Ren²; ¹Michigan Technological University; ²Argonne National Laboratory

9:50 AM

Martensitic Transformation Precursor: Phonon Theory: *Yongmei Jin*¹; Yu Wang¹; ¹Michigan Technological University

10:10 AM Break

10:30 AM Invited

Strain Glass and Ferroic Glass as New Candidates for Novel Properties: *Xiaobing Ren*¹; Yu Wang²; Yumei Zhou²; Dong Wang²; Yunzhi Wang³; Kazuhiro Otsuka¹; ¹National Institute for Materials Science; ²Xi'an Jiaotong University; ³Ohio State University

11:00 AM

The Microstructure Theories of Dislocated Martensitic Steels: *Liang Qi*¹; Armen Khachaturyan¹; John Morris¹; ¹University of California Berkeley

Microstructural Processes in Irradiated Materials — Reactor Pressure Vessel and Ferritic/Martensitic Alloys

Sponsored by: TMS: Nuclear Materials Committee Program Organizers: Dane Morgan, University of Wisconsin -Madison; Thak Sang Byun, Oak Ridge National Laboratory; Yasuyoshi Nagai, Tohoku University; Zhijie Jiao, University of Michigan; Kai Nordlund, University of Helsinki; Ming-Jie Zheng, University of Wisconsin

Monday AM March 16, 2015 Room: Asia 1 Location: Dolphin

Funding support provided by: Idaho National Laboratory Oak Ridge National Laboratory

Session Chairs: G. Robert Odette, University of California Santa Barbara; Marta Serrano, CIEMAT

8:30 AM Invited

An Overview of Selected Results from LONGLIFE and PERFORM60 European Projects: *Marta Serrano*¹; Eberhard Altstadt²; Abderrahim Al Mazouzi³; Lorenzo Malerba⁴; ¹CIEMAT; ²HZDR; ³EDF; ⁴SCK CEN

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9:00 AM

Atom Probe Tomography Characterizations of Irradiated and Annealed Reactor Pressure Vessel Surveillance Specimens: Michael Miller¹; *Randy Nanstad*¹; Kathy Powers¹; ¹Oak Ridge National Laboratory

9:15 AM

Thermal Stability of Nanoscale Ni-Mn-Si Precipitates in Irradiated Reactor Pressure Vessel Steels: *Peter Wells*¹; Yuan Wu¹; Nathan Almirall¹; Takuya Yamamoto¹; David Gragg¹; G. Odette¹; ¹UC Santa Barbara

9:30 AM

MONDAY AM

Cluster Dynamics Modeling of Multi-Phase Mn-Ni-Si-Rich Precipitation Evolution in Low Cu RPV Steels: *Huibin Ke*¹; Leland Barnard¹; Dane Morgan¹; Peter Wells²; G. Odette²; ¹University of Wisconsin-Madison; ²University of California-Santa Barbara

9:45 AM

Structural Characterization of Nano-Precipitates in Irradiated Reactor Pressure Vessel Steels: *David Sprouster*¹; J Sinsheimer¹; S Ghose¹; E Dooryhee¹; L Ecker¹; P Wells²; Y. Wu²; G. R. Odette²; M Sokolov³; ¹Brookhaven National Laboratory; ²University of California Santa Barbara; ³Oak Ridge National Laboratory

10:00 AM Break

10:15 AM

APT Investigation of the Effect of Neutron Fluence on the Microstructural Evolution of Irradiated Low Copper RPV Steels: Sebastiano Cammelli¹; *Bertrand Radiguet*¹; Philippe Pareige¹; ¹GPM UMR CNRS 6634 - Université et INSA de Rouen

10:30 AM Invited

Development of Combined Thermomechanical and Radiation Testing Platforms: Daniel Bufford¹; Mackenzie Steckbeck¹; *Khalid Hattar*¹; ¹Sandia National Laboratories

11:00 AM

Effect of Cu and Mn on Radiation Induced Hardening and Microstructure of A533B Model Alloys: *Hideo Watanabe*¹; Yasuhiro Kamada²; ¹RIAM, Kyushu University, ; ²RIAM, Kyushu University,

11:15 AM

Diffusivity and Solubility of Cu in Fe and A533B Measured by Atom Probe Tomography: Yasuyoshi Nagai¹; Masaki Shimodaira¹; Takeshi Toyama¹; Yasuo Shimizu¹; Koji Inoue¹; Naoki Ebisawa¹; ¹Tohoku University

11:30 AM

Effects of Dose Rate and Primary Defect Structure on Microstructural Evolutions in RPV Steels: *Takuya Yamamoto*¹; Peter Wells¹; Yuan Wu¹; G. Robert Odette¹; Hideo Watanabe²; Akihiko Kimura³; ¹University of California Santa Barbara; ²Kyushu University; ³Kyoto University

11:45 AM

Development of Improved Accident Tolerant Cladding Materials: Osman Anderoglu¹; Yuki Yamamoto²; Lance Snead²; Joe Tesmer¹; Stuart Maloy¹; ¹Los Alamos National Laboratory; ²Oak Ridge National Laboratory

12:00 PM

Neutron Flux Effects on Irradiation-Induced Solute Clusters and Matrix Defects in RPV Steels Studied by Positron Annihilation: *Takeshi Toyama*¹; T Yamamoto²; P Wells²; Y Nagai¹; G. Odette²; ¹Tohoku University; ²University of California Santa Barbara

Multiscale Microstructure, Mechanics and Prognosis of High Temperature Alloys — Characterization and Mechanical Properties

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: High Temperature Alloys Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Mark Tschopp, Army Research Laboratory; Jeffrey Evans, University of Alabama in Huntsville; Jonathan Cormier, ENSMA / Institut Pprime - UPR CNRS 3346; Qiang Feng, University of Science and Technology Beijing

Monday AM	Room: Oceanic 7
March 16, 2015	Location: Dolphin

Session Chairs: Jonathan Cormier, ISAE-ENSMA & Institut Pprime; Qiang Feng, University of Science and Technology Beijing ; Mark Tschopp, Army Research Laboratory

8:30 AM Keynote

Fatigue Properties and Acquisition of 3D Microstructural Data for Prediction of Crack Initiation and Early Crack Growth in Polycrystalline Superalloys: Jean-Charles Stinville¹; Will Lenthe¹; McLean Echlin¹; *Tresa Pollock*¹; ¹University of California Santa Barbara

9:10 AM

Investigation of 3D Microstructural Compatibility during Ambient Temperature Deformation in a New Co-Hf Model Alloy: *Mohammed Azeem*¹; Shyamprasad Karagadde¹; Daniel Rowley¹; Brian Bay²; Peter Lee¹; ¹Manchester University; ²Oregon State University

9:30 AM

Porosity Evolution during High Temperature Creep Tests in a Single Crystal Superalloy by 3D X-ray Computed Tomography: *Jean-Briac le Graverend*¹; Jerome Adrien²; Jonathan Cormier³; Franck Gallerneau⁴; Serge Kruch⁴; José Mendez³; ¹Texas A&M University; ²INSA de Lyon; ³Institut P'/ ISAE-ENSMA; ⁴ONERA

9:50 AM

Local/Global Measurement of Primary Dendrite Arm Spacing in Single Crystal Nickel-Based Superalloys: *Mark Tschopp*¹; Andrew Oppedal²; Kiran Solanki³; ¹Army Research Laboratory; ²Mississippi State University; ³Arizona State University

10:10 AM Break

10:30 AM Invited

Descriptions of the Deformation Behavior and Properties of Hybrid Superalloys for Elevated Temperature Applications: Samuel Kuhr¹; John Sosa¹; Gopal Viswanathan¹; J.C. Zhao¹; Yunzhi Wang¹; *Hamish Fraser*¹; ¹The Ohio State University

10:50 AM Invited

Dwell-Fatigue Crack Growth of a Nickel Based Superalloy in the Range 650-800°C: *Hamouda Ghonem*¹; ¹University of Rhode Island

11:10 AM

Rejuvenation of Nickel-Based Superalloys GTD444(DS) and René N5(SX): *Luke Rettberg*¹; Tresa Pollock¹; ¹University of California Santa Barbara

11:30 AM Invited

Effect of Notches on Creep-Fatigue Behavior of P/M Nickel-Based Disk Superalloy: Jack Telesman¹; Tim Gabb¹; Louis Ghosn¹; ¹NASA GRC

11:50 AM

Recent Advances in Cast SX Superalloys: Jacqueline Wahl¹; ¹Cannon-Muskegon

MONDAY AM

Nanocomposites III — Metal Nanocomposites I

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Muralidharan Paramsothy, National University of Singapore, NanoWorld Innovations (NWI); Meisha Shofner, Georgia Institute of Technology; Changsoo Kim, University of Wisconsin-Milwaukee

Monday AMRoom: Europe 2March 16, 2015Location: Dolphin

Session Chair: Meisha Shofner, Georgia Institute of Technology

8:30 AM

Interfacial Fate of Boron Carbide Nanoparticles within Ultrafine Grained Aluminum Matrix Nanocomposites: *Lin Jiang*¹; Haiming Wen¹; Hanry Yang¹; Troy Topping¹; Enrique Lavernia¹; Julie Schoenung¹; ¹University of California Davis

8:50 AM Invited

PM Aluminum Composite Reinforced with Al4C3 Nano-Rods: *Katsuyoshi Kondoh*¹; Biao Chen¹; Lei Jia¹; Junko Umeda¹; Hisashi Imai¹; ¹Osaka University

9:30 AM

Nanocrystallization in Spark Plasma Sintered Fe48Cr15Mo14Y2C15B6 Bulk Amorphous Alloy: Ashish Singh¹; Sandip Harimkar¹; ¹Oklahoma State University

9:50 AM Break

10:10 AM

Crack Formation in Powder Metallurgy CNT/Al Composites during Post Heat Treatment: *Biao Chen*¹; Lei Jia¹; Hasashi Imai¹; Katsuyoshi Kondoh¹; ¹Osaka University

10:30 AM

The Dielectric Behavior of Reduced Graphene Oxide/polymer Composites with a Segregated Structure: *Mengkai Li*¹; C. X. Gao¹; X. Zhang¹; Z. D. Zhao¹; F. L. Meng¹; ¹Jilin University

10:50 AM

The Structural and Mechanical Properties of Graphene Aerogel Supported PVDF/Graphene Oxide Nanocomposites: *Zhiyuan Jiang*¹; Zhuo Han¹; Guangping Zheng¹; ¹The Hong Kong Polytechnic University

11:10 AM

Three Dimensional Mesoscale Finite Element Analysis of Polymer/Clay Nanocomposites Using a Physically Based, Internal State Variable Model: *William Lawrimore*¹; Mei Chandler²; Mark Horstemeyer¹; ¹Mississippi State University; ²Army Engineering Research and Development Center

Nanostructured Materials for Rechargeable Batteries and for Supercapacitors III — Session I: Advanced Battery Chemistries

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee

Program Organizers: Reza Shahbazian-Yassar, Michigan

Technological University; Yan Yao, University of Houston; David Mitlin, Clarkson University

/londay AM	Room: Europe 3
/larch 16, 2015	Location: Dolphin

Session Chairs: Reza Shahbazian-Yassar, Michigan Technological University; David Mitlin, University of Alberta

8:30 AM Keynote

Two Electron Intercalation Cathodes: Two Li Ions as an Alternative to Mg: *M. Whittingham*¹; ¹SUNY at Binghamton

9:00 AM Invited

Opportunities and Challenges of Magnesium Rechargeable Batteries: Electrolytes and Cathodes: *Guosheng Li*¹; ¹Pacific Northwest National Laboratory

9:25 AM Invited

Modification of Magnesium Ion Cathode and Electrolyte for Mg Rechargeable Batteries: Yan Yao¹; ¹University of Houston

9:50 AM Invited

Sodium Ion Battery Anodes: Gabriel Veith¹; ¹Oak Ridge National Laboratory

10:15 AM Break

10:30 AM Invited

High Density Sodium and Lithium Ion Battery Anodes from Banana Peels: David Mitlin¹; ¹Clarkson University

10:55 AM Invited

Achieving Low Overpotentials in Metal-Air Batteries: *Yiying Wu*¹; ¹Ohio State University

11:20 AM Invited

Nanostructured Electrodes for Na-Air Batteries: Understanding of Chemistry and Rechargeability: Andy Sun¹; ¹The University of Western Ontario

11:45 AM Invited

Na3MnCO3PO4 – A Multi-Electron Transfer Redox Cathode Material for Sodium Ion Batteries: Chuanlong Wang¹; James Kaduk¹; Monica Sawicki¹; *Leon Shaw*¹; ¹Illinois Institute of Technology

Neutron and X-Ray Studies of Advanced Materials VIII: Diffraction Limit and Beyond — Space and Time Resolved I

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Brent Fultz, California Institute of Technology; Peter Liaw, University of Tennessee; Jaimie Tiley, Air Force Research Laboratory

Monday AM	Room: Pelican 1
March 16, 2015	Location: Swan

Funding support provided by: Air Force Research Laboratory

Session Chairs: Rozaliya Barabash, ORNL; Gernot Kostorz, ETH

8:30 AM Introductory Comments

8:40 AM Keynote

HEDM: Spatially Resolved Measurements of Lattice Orientation and Strain in Polycrystals: *Robert Suter*¹; ¹Carnegie Mellon University

9:20 AM Invited

Characterization of the Influence of Grain Neighbors on Heterogeneous Deformation Using Synchrotron X-ray Diffraction: *Thomas Bieler*¹; Martin Crimp¹; Carl Boehlert¹; Philip Eisenlohr¹; Farhang Pourboghrat¹; Chen Zhang¹; Hongmei Li¹; Payam Darbandi¹; Bite Zhou¹; Quan Zhou¹; Leyun Wang²; Armand Beaudoin³; Tae-Kyu Lee⁴; Peter Kinesei⁵; Jun-Sang Park⁵; Wenjun Liu⁵; ¹Michigan State University; ²Institute of Materials Research; ³University of Illinois; ⁴Cisco Systems, Inc.; ⁵Argonne National Laboratory

9:50 AM

3D Computational and Diffraction Study of Indentation in Layered Materials: *Rozaliya Barabash*¹; Iwona Jasiuk²; Vineet Agarwal²; Seid Koric²; ¹Oak Ridge National Laboratory; ²University of Illinois at Urbana-Champaign

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10:10 AM Break

10:20 AM Invited

Combinatorial Study of Precipitation Kinetics in Cu-Co Composition Gradients: Time and Space Resolved SAXS Measurements: *Alexis Deschamps*¹; Frederic De Geuser¹; Christopher R. Hutchinson²; Mark Styles³; ¹Grenoble Institute of Technology; ²Monash University; ³CSIRO

10:50 AM Invited

The Importance of 3D Synchrotron X-ray Techniques for Advancing the Understanding of Recrystallization Process of Metals: *Yubin Zhang*¹; ¹Technical University of Denmark

11:20 AM Invited

In Situ Three Crystal Diffractometry Investigation of a Single Crystal Superalloy during High Temperature Mechanical Testing: Pierre Bastie¹; Thomas Schenk²; *Alain Jacques*²; ¹ILL; ²IJL-CNRS, Labex DAMAS

11:50 AM

Direct Measurement of Hydrogen Dislocation Pipe Diffusion in Deformed Polycrystalline Pd Using Quasielastic Neutron Scattering: *Brent Heuser*¹; Dallas Trinkle¹; Niina Jalarvo²; Joseph Serio¹; Emily Schiavonev¹; Eugene Mamontov²; Madhusudan Tyagi³; ¹University of Illinois; ²Oak Ridge National Laboratory; ³NIST

New Horizons for Mechanical Spectroscopy in Materials Science — RUS and Mechanical Spectroscopy in General

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Nicolás Mujica, Universidad de Chile; Michael Demkowicz, MIT; Fernando Lund, Universidad de Chile; Alfredo Caro, Los Alamos National Laboratory

Monday AM	Room: Macaw 1
March 16, 2015	Location: Swan

Session Chair: Nicolás Mujica, Universidad de Chile

8:30 AM Invited

Resonant Ultrasound Spectroscopy: An Odyssey in Measurement Science: *Albert Migliori*¹; ¹Los Alamos National Laboratory

9:00 AM Invited

Magnetoelastic Coupling in Ferroic and Multiferroic Materials from Resonant Ultrasound Spectroscopy: Michael Carpenter¹; ¹University of Cambridge

9:30 AM

Elastic Moduli of Palladium Hydride Near the Tri-Critical Point: *Joseph Gladden*¹; Doug Safarik²; Rasheed Adebisi³; ¹University of Mississippi; ²Los Alamos National Laboratory; ³Air Force Research Laboratory

9:50 AM

Elastic Stiffness of Cubic and Wurtzite Boron Nitride: *Akira Nagakubo*¹; Hirotsugu Ogi¹; Hitoshi Sumiya²; Masahiko Hirao¹; ¹Osaka University; ²Sumitomo Electric Industries

10:10 AM Break

10:30 AM Invited

Viscoelastic Properties of Model Bitumen Systems from Molecular Simulations: Michael Greenfield¹; ¹University of Rhode Island

11:00 AM

RUS Measurements and FE Models of Nickel Superalloy Structures and Damage: *Brent Goodlet*¹; Tresa Pollock¹; ¹University of California Santa Barbara

11:20 AM

Ab Initio Modeling of Internal Friction in Irradiated Zirconium: Céline Varvenne¹; *Emmanuel Clouet*¹; ¹SRMP, CEA Saclay

11:40 AM

AFM Force Spectroscopy Experiments and Simulations of Fouling-Resistant Materials: Abdulla Alhajri¹; Rasheed Auguste¹; Pavlina Karafilis¹; Gabrielle Ledoux¹; Vikash Mishra²; Ekaterina Paramonova¹; *Michael Short*¹; ¹Massachusetts Institute of Technology; ²University of Arkansas

Novel Synthesis and Consolidation of Powder Materials — Cold Spray Forming, Metal Powders and Additive Manufacturing

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee Program Organizers: Ma Qian, RMIT University (Royal Melbourne

Institute of Technology); Iver E Anderson, The Ames Laboratory

Monday AM	Room: Swan 10
March 16, 2015	Location: Swan

Session Chairs: John Slotwinski, Johns Hopkins University ; Stefan Gulizia, CSIRO

8:30 AM

Cold Spray for Repair of Naval Components: Jennifer Wolk¹; *Ben Bouffard*¹; Fred Lancaster²; ¹Naval Surface Warfare Center; ²NAVAIR

8:50 AM

Modeling of Operational Parameters for Cold Spray Deposition: *Jeremy Schreiber*¹; Ivi Smid¹; Tim Eden¹; ¹Penn State

9:10 AM

Metal Based Additive Manufacturing Using Cold Spray Coating Technology: G. Sundararajan¹; ¹ARCI

9:30 AM

Microstructure of Cold Sprayed hBN-Ni and Ni-Ni Composite Powders: Maryam Neshastehriz¹; *Ivi Smid*¹; Al Segall¹; Tim Eden¹; ¹Penn State

9:50 AM Break

10:10 AM Invited

Manipulation of Titanium Powder for Additive Manufacturing Applications: *Stefan Gulizia*¹; Anselm Oh¹; Christian Doblin¹; Ying Ying Sun²; Ma Qian²; ¹CSIRO; ²RMIT

10:35 AM

High-Efficiency Production of Metal Particulate by Modulation-Assisted Machining: James Mann¹; Kevin Trumble²; W Compton²; Srinivasan Chandrasekar²; ¹M4 Sciences LLC; ²Purdue University

10:55 AM

Microstructure-Deposition-Microstructure Relationships for Al-Cu Gas Atomized Powders: *Luke Brewer*¹; Jeremy Leazer¹; Sarath Menon¹; Jennifer Wolk²; Frederick Lancaster³; ¹Naval Postgraduate School; ²Naval Surface Warfare Center Carderock Division; ³NAVAL Air Systems Command

MONDAY AM

Pb-Free Solders and Emerging Interconnect and Packaging — Fundamental Materials Behavior

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Electronic Packaging and Interconnection Materials Committee *Program Organizers:* John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corp.; Andre Lee, Michigan State University; Fan-Yi Ouyang, National Tsing Hua University; Srini Chada, Schlumberger; Kyu-Oh Lee, Intel Corp.; Kwang-Lung Lin, National Cheng Kung University; Christopher Gourlay, Imperial College; Daniel Lewis, Rensselaer Polytechnique Institute; Fan Gao, University of Masachusetts Lowell

Monday AMRoom: LarkMarch 16, 2015Location: Swan

Session Chairs: John Elmer, Lawrence Livermore National Laboatory; Tae-Kyu Lee, Cisco Systems

8:30 AM

Solidification Rate and Al Concentration Effects on Cu-Al Intermetallic Phases in Pb-Free Solders: Implications for Solder Joint Microstructure Control: *Iver Anderson*¹; Stephanie Choquette²; Kathlene Reeve³; Carol Handwerker³; ¹Ames Laboratory; ²Iowa State University; ³Purdue University

8:55 AM

Influence of the Substrate on the Nucleation of Beta-Sn in Solder Reactions: Christopher Gourlay¹; Sergey Belyakov¹; ¹Imperial College London

9:20 AM

Heterogeneous Nucleation of ß-Sn in Aluminum-Modified Lead-Free Solder Alloys: *Kathlene Reeve*¹; Iver Anderson²; Carol Handwerker¹; ¹Purdue University; ²Ames Laboratory

9:45 AM

Understanding the Behavior of Solder Joints Subject to Harsh Environments Using Multi-Scale Characterization Techniques: *Govindarajan Muralidharan*¹; Donovan Leonard¹; Chad Parish¹; Claudia Cantoni¹; ¹Oak Ridge National Laboratory

10:10 AM Break

10:25 AM

In Situ Visualization of One-Dimensional Cu/Sn Diffusion Couples for Nanomaterials Assembly and Interconnection: *Fan Gao*¹; Qiyue Yin²; Zhiyong Gu¹; Guangwen Zhou²; ¹University of Massachusetts Lowell; ²State University of New York at Binghamton

10:50 AM

Quantifying the Anisotropy of Sn-Based Solder Alloys by Micropillar Compression Experiments: Influence of Size, Grain Boundaries and Precipitates: C. Shashank Kaira¹; Nikhilesh Chawla¹; ¹Arizona State University

11:15 AM

Slip Parameters for Crystal Plasticity Finite Element Analysis of Cu6Sn5 Single Crystal Intermetallic in Solder Joint: Experiment, Modeling and a Comparative Analysis: Soud Choudhury¹; Leila Ladani¹; ¹University of Connecticut

11:40 AM

Wettability and Interfacial Characteristic of Sn-Bi-Cu Solder on Ni Substrates: *Likun Zang*¹; Liying Lu¹; ¹University of Science and Technology

Phase Transformations and Microstructural Evolution — Iron Chromium Alloys I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee Program Organizers: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Soumya Nag, University of North Texas; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama; Amy Clarke, Los Alamos National Laboratory; Frederic Danoix, CNRS - Université de Rouen; Emmanuelle Marquis, University of Michigan

Monday AM March 16, 2015 Room: Swan 1 Location: Swan

Session Chairs: Frédéric Danoix, Université de Rouen; Peter Hedström, KTH - Royal Institute of Technology

8:30 AM Invited

Phases Transitions in Fe-Cr Alloy System as Studied by Mössbauer Spectroscopy: *Stanislaw Dubiel*¹; ¹AGH University of Science and Technology

9:10 AM

Effect of Stress and Strain on Spinodal Decomposition in Binary Fe-Cr Alloys: Jingqi Zhang¹; Peter Hedström¹; Frederic Danoix²; Helena Zapolsky²; *Joakim Odqvist*¹; ¹KTH (Royal Institute of Technology); ²University of Rouen

9:30 AM Invited

Kinetics of α' Precipitation in Fe-19at.%Cr: APT, SANS and Mossbauer Spectrometry: Olivier Tissot¹; *Cristelle Pareige*¹; Marie-Hélène Mathon²; Jean Juraszek¹; Estelle Meslin²; Brigitte Descamps³; Alain Barbu²; Jean Henry²; ¹University of Rouen; ²CEA; ³CNRS

10:10 AM Break

10:30 AM Invited

Microstructures of Neutron-Irradiated Fe-Cr Alloys: *Mukesh Bachhav*¹; Lan Yao¹; G. Robert Odette²; Emmanuelle Marquis¹; ¹University of Michigan; ²University of California Santa Barbara

11:10 AM

The Effect of Fe-Ion Irradiation on the Microstructure of a Fe-6Cr Binary Alloy: Correlative TEM and APT Observations: *Yuan Wu*¹; Peter Wells¹; George Odette¹; Chris Hardie²; S Roberts²; Emmanuelle Marquis³; Mukes Bachhav³; Lan Yao³; Dhriti Bhattacharyya⁴; ¹UCSB; ²University of Oxford; ³University of Michigan; ⁴Australian Nuclear Science and Technology Organization

11:30 AM

Phase Separation in Fe-Cr Alloys Studied by Small Angle Neutron Scattering: Xin Xu¹; Joakim Odqvist¹; Magnus Hörnqvist²; Mattias Thuvander²; Axel Steuwer³; Peter Hedström¹; ¹KTH Royal Institute of Technology; ²Chalmers University of Technology; ³MAX IV Laboratory, Lund University/ Nelson Mandela Metropolitan University

11:50 AM Invited

Spinodal Decomposition in Multilayered Fe-Cr Systems: A Cahn-Hillard-Type Modeling: *Philippe Maugis*¹; Yann Colignon¹; Dominique Mangelinck¹; Khalid Hoummada¹; Myriam Dumont¹; ¹CNRS



Phase Transformations and Microstructural Evolution — Liquid-Solid Phase Transformations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Soumya Nag, University of North Texas; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama ; Amy Clarke, Los Alamos National Laboratory; Frederic Danoix, CNRS - Université de Rouen; Emmanuelle Marquis, University of Michigan

Monday AM	Room: Swan 3
March 16, 2015	Location: Swar

Session Chairs: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; John Gibbs, Northwestern University

8:30 AM Invited

3D Characterization of Dendritic Growth in Al-Cu Alloys: *John Gibbs*¹; Kadri Mohan²; Xianghui Xiao³; Charlie Bouman²; Peter Voorhees¹; ¹Northwestern University; ²Purdue University; ³Argonne National Laboratory

9:00 AM

High-temperature Transformation of Ti-Al-Nb Alloys Using a Beta Solidification Technique: *Jongmoon Park*¹; Ho-Seung Jang²; Seong-Woong Kim³; Seung-Eon Kim³; Je-Ha Shon⁴; Myung-Hoon Oh¹; ¹Advanced Materials Engineering, Kumoh National Institute of Technology; ²Advanced Materials & System Engineering, Kumoh National Institute of Technology; ³Titanium Department, Korea Institute of Materials Science (KIMS); ⁴Advanced Technology Team, Pohang Institute of Metal Industry Advancement

9:20 AM

Phase-Field Investigation of the Influence of the Solid-Liquid Interface Energy and Process Parameters on the Dendrite Growth Morphology and Microsegregation for High Manganese Steels: *Joao Rezende*¹; Celso Alves¹; Christian Schankies¹; Dennis Hüttenmeister¹; Dieter Senk¹; ¹RWTH Aachen

9:40 AM

Effect of Two Free Dendritic Growth Models on the Simulation of Microstructure Formation in Solidification Process of Fe-0.4WT.%C Alloy: *Wanping Pan*¹; Jieyu Zhang¹; ¹Shanghai University

10:00 AM Break

10:20 AM

Effect of Heat Treatment on Microstructure Evolution of a Ni-Base Superalloy Fabricated by Laser-Powder Bed Fusion Additive Manufacturing: Hyeyun Song¹; Shawn Kelly²; *Wei Zhang¹*; ¹Ohio State University; ²EWI

10:40 AM

Heterogenous Microstructure Characterization in INCONEL 718 Builds Made by the Direct Laser Additive Manufacturing Process: Yuan Tian¹; Donald McAllister¹; Sudarsanam Babu²; ¹Ohio State University; ²University of Tennessee, Knoxville

11:00 AM

Plasma to Phase Transformation: Lijun Song¹; *Jyotirmoy Mazunder*²; ¹SenSigma LLC; ²University of Michigan

11:20 AM

Combinatorial Assessment of the Influence of Alloying Elements on the Oxidation Behavior of Titanium: *Peyman Samimi*¹; Peter Collins¹; David Brice¹; Iman Ghamarian¹; Yue Liu¹; ¹University of North Texas

11:40 AM

The Role of the Bronze Phase Transformation during Liquid Phase Sintering of Sn-Coated Cryomilled Cu Powders: David Walker¹; William Caley²; *Mathieu Brochu*¹; ¹McGill University; ²Dalhousie University

12:00 PM

Research on Non-Directional Solidification Process of AISI 301 Austenite Stainless Steel: *Liang Bai*¹; Bo Wang¹; Shuqing Xing²; Yonglin Ma²; Jieyu Zhang¹; ¹Shanghai University; ²Inner Mongolia University of Science and Technology

Polycrystalline Materials: Bringing Together Experiments, Simulations, and Analytic Theories — Session I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Dana Zöllner, Otto von Guericke University Magdeburg; Douglas Medlin, Sandia National Laboratories; Dmitri Molodov, RWTH Aachen

Monday AMRoom: Oceanic 8March 16, 2015Location: Dolphin

Session Chairs: Dana Zöllner, Otto-von-Guericke-University Magdeburg; Dorte Juul Jensen, Technical University of Denmark

8:30 AM Invited

3D Experimental Characterizations of Recrystallization Compared to Theoretical Simulations: *Dorte Jensen*¹; ¹DTU

9:00 AM

The Influence of Aluminum Content on Recrystallization and Grain Growth in α-Titanium Alloys: Anna Trump¹; John Allison¹; ¹University of Michigan

9:20 AM

Simulating Recrystallization In Plastically Deformed Titanium-Aluminum Alloys: Susan Gentry¹; Katsuyo Thornton¹; ¹University of Michigan

9:40 AM

{111}<110> Recrystallization Texture Evolution during Solution Treatment of Age-Hardenable Al-Mg-Si Alloy Sheets Fabricated by Cold Rolling and Subsequent Asymmetric Warm Rolling: *Hirofumi Inoue*¹; ¹Osaka Prefecture University

10:00 AM

Processing and Microstructure Effects on the Recrystallization of Low-Symmetry Alpha-Uranium as Measured by EBSD: *Rodney McCabe*¹; Andrew Richards¹; Marko Knezevic²; Kester Clarke¹; Irene Beyerlein¹; ¹Los Alamos National Laboratory; ²University of New Hampshire

10:20 AM Break

10:40 AM Invited

Three-Dimensional X-Ray Diffraction Microscopy for In Situ Studies of Polycrystalline Materials: Jette Oddershede¹; ¹DTU Physics

11:10 AM

Physical Aspects of Dynamic Recrystallization: *Günter Gottstein*¹; Katrin Grätz¹; ¹RWTH Aachen University

11:30 AM

Impurity Effects on Morphological Stability of Recrystallization Fronts: *Changjian Wang*¹; Moneesh Upmanyu¹; ¹Northeastern University

11:50 AM

Modeling Microstructural Evolution during Recrystallization in Hot Rolled Structure: Khaled Adam¹; David Field¹; ¹Washington State University

MONDAY AM

Rare Metal Extraction & Processing 2015 — Rare Metal Processes

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee *Program Organizers:* Neale Neelameggham, Ind LLC; Shafiq Alam, University of Saskatchewan; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto Kennecott Utah Copper

Monday AM March 16, 2015

Room: Asbury C Location: Yacht & Beach

Session Chairs: Shafiq Alam, University of Saskatchewan; Takashi Nakamura, Tohoku University

9:30 AM

Industrial Practice of Biohydrometallurgy in Zambia: *Jun Wang*¹; Hongbo Zhao¹; Wenqing Qin¹; Xueduan Liu¹; Guanzhou Qiu¹; ¹Central South University; Key Lab of Biohydrometallurgy of Ministry of Education

9:50 AM

Industry Oxygen and Its Advanced Application Technology for Hydrometallurgy Process: Rocky Wei¹; De-liang Zhang¹; ¹Linde Gas

10:10 AM Break

10:25 AM

Electrochemical Removal Impurity of NaCl from LiCl-KCl Melts: *Bing* Li^{1} ; ¹East China University of Science and Technology

10:45 AM

Modern Beryllium Extraction - A State-of-the-Art Kroll Reduction Plant: *Edgar Vidal*¹; James Yurko¹; Keith Smith¹; ¹Materion Brush Beryllium and Composites Inc.

11:05 AM

How to Recover Minor Rare Metals from E-scrap Recycling: Takashi Nakamura¹; ¹Tohoku University

11:25 AM

Solvent Extraction of Cu2+ from the Leaching Liquor Containing Cu and Fe Using a Microfluidic Technology: *Jiang Feng*¹; ¹Kunming University of Science and Technology

11:45 AM

Large-Scale Testing of Vacuum-Distillation Refining of Ill-Conditioned Rough Selenium: *Sergey Trebukhov*¹; Vladimir Khrapunov¹; Farhad Tyleytai¹; Alina Nitcenko¹; Irina Marki¹; ¹Center of the Earth Sciences, Metallurgy and Enrichment JSC

Recent Developments in Biological, Structural and Functional Thin Films and Coatings — Session I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee

Program Organizers: Adele Carradò, IPCMS; Heinz Palkowski, Clausthal Univ of Technology; Roger Narayan, University of North Caroloina; Nuggehalli Ravindra, New Jersey Institute of Technology; Nancy Michael, University of Texas at Arlington

/londay AM	Room: Parrot
<i>l</i> larch 16, 2015	Location: Swan

Session Chairs: Nancy Michael, UT Arlington; Nuggehalli Ravindra, New Jersey Institute of Technology

8:30 AM Keynote

Multifunctional Materials for Electronics and Photonics: Federico Rosei¹; ¹INRS

9:10 AM

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The Effect of Microstructure and Thickness on Resistance Switching Behavior of Electrodeposited Cuprous Oxide Thin Films: Sanaz Yazdanparast¹; Jay Switzer¹; ¹Missouri University of Science and Technology

9:30 AM

Refractory Thin-Films Derived from Organometallic Polymers: *Mark Roll*¹; Natalie Kirch¹; ¹University of Idaho

9:50 AM Invited

Evaluation of Titanium and Nitrogen Doped Tungsten Oxide Thin Films for Application in Solar Energy Conversion: *Ramana Chintalapalle*¹; ¹University of Texas - El Paso

10:20 AM Break

10:40 AM

New Architectures of Interlayer Systems Designed for Diamond Coating for Aeronautic Applications: *Maureen Cheviot*¹; Angéline Poulon¹; Mohamed Gouné¹; ¹ICMCB-CNRS

11:00 AM

Production and Characterisation of Al2Cu Reinforced Copper Matrix Composite Coatings: Valbona Dylmishi¹; *Onur Tazegul*¹; Huseyin Cimenoglu¹; ¹Istanbul Technical University

11:20 AM

Synthesis of Multi-functional Surfaces Inspired from The Peristome of Pitcher Plants: *Yu-Min Lin*¹; Chaio-Peng Hsu¹; Po-Yu Chen¹; ¹National Tsing Hua University

Recycling and Sustainability Update — Waste

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Randolph Kirchain, Massachusetts Institute of Technology; Jeffrey S. Spangenberger, Argonne National Laboratory

Monday AM March 16, 2015 Room: Grand Harbor Salon 4 Location: Yacht & Beach

Session Chair: Jeffrey Spangenberger, Argonne National Laboratory

9:30 AM

The Removal of Phosphate and Ammonia Nitrogen from Wastewater Using Steel Slag: Liyun Yang¹; ¹University of Science and Technology Beijing

9:50 AM

Bioleaching of Ocean Nodules with Thermophilic Bacteria: *N Abhilash*¹; Anirban Ghosh¹; B.D. Pandey¹; ¹National Metallurgical Laboratory (CSIR)

10:10 AM Break

10:25 AM

Sustainable Recycling Technologies for Bauxite Residue (Red Mud) Utilization: Thenepalli Thriveni¹; Seong Young Nam¹; *Ahn Ji Whan*¹; ¹Korea Institute of Geosciences and Mineral Resources(KIGAM)

10:45 AM

Modifications on the Red Mud via Wet Processes and Its Activity for Chemical Looping Combustion: Zhenhua Gu¹; *Kongzhai Li*¹; ¹Kunming University of Science and Technology

11:05 AM

Study of Mineral Admixtures on Mechanical and Physical Properties in the Fabrication of Sustainable Concrete: *Nitza Garcia*¹; Oscar Marcelo Suarez¹; Mauricio Cabrera-Rios¹; ¹University of Puerto Rico

Refractory Metals 2015 — Alloy Design, Application and Oxidation

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee Program Organizers: Gary Rozak, HC Starck Inc; S.K. Varma,

Program Organizers: Gary Rozak, HC Starck Inc; S.K. Varma, University of Texas El Paso

Monday AMRoom: Europe 1March 16, 2015Location: Dolphin

Session Chair: Todd Leonhardt, Rhenium Alloys, Inc

8:30 AM

Refractory Metals: Overview and Recent Developments: Prabhat Kumar¹; *Gary Rozak*²; ¹PK Consulting; ²HC Starck Inc

8:50 AM

Computational Design of Refractory Metal High-Entropy Alloys: Michael Gao¹; Jeff Hawk²; David Alman²; ¹NETL/URS; ²NETL

9:10 AM

On the Mo-Ti-Fe System for Alloy Design: *Alexander Knowles*¹; Nick Jones¹; Neil Jones²; Howard Stone¹; ¹University of Cambridge; ²Rolls-Royce plc, Derby

9:30 AM

Coherent and Duplex Precipitation in High-Temperature Cr-Ni-Al-Ti Alloys: Omer Dogan¹; Xueyan Song²; Michael Gao³; ¹DOE National Energy Technology Laboratory; ²West Virginia University; ³URS Corporation

9:50 AM Break

10:00 AM Invited

Crystallography of the BCC/T1/T2 Eutectic in Mo-Nb-Si-B Alloys: Naoki Takata¹; Nobuaki Sekido²; *John Perepezko*³; Masao Takeyama¹; ¹Tokyo Institute of Technology; ²National Institute for Materials Science; ³University of Wisconsin-Madison

10:20 AM

Effects of Mo/Si Ratio Inversion on the Oxidation of Nb-Cr-Mo-Si-B Alloys: Shailendra Varma¹; *Kathryn Thomas*¹; ¹The University of Texas at El Paso

10:40 AM

Influence of Ti Additions on Microstructure and Oxidation Resistance of Mo-Si-B-Ti Alloys: Maria Azim¹; ¹University of Siegen

11:00 AM

Interdiffusion and Reaction in Mo vs. Fe Diffusion Couples: *Esin Geller*¹; Yongho Sohn¹; B. Sencer²; J. Kennedy²; ¹University of Central Florida; ²Idaho National Laboratory

11:20 AM

Dislocation-magnetic Field Interactions in Nb Used for Superconducting Particle Accelerator Cavities: *Mingmin Wang*¹; Di Kang¹; Zu Sung²; Peter Lee²; Anatolii Polyanskii²; Christopher Compton¹; Thomas Bieler¹; ¹Michigan State University; ²Florida State University

11:40 AM

Study of Slip and Dislocations in High Purity Single Crystal Nb for Accelerator Cavities: *Di Kang*¹; Derek Baars¹; Thomas Bieler¹; Chris Compton²; ¹Michigan State University; ²Facility for Rare Isotope Beams

Solar Cell Silicon — Silicon Production and Refining

Sponsored by: TMS: Recycling and Environmental Technologies Committee

Program Organizers: Gabriella Tranell, Norwegian University of Science & Technology; Yulia Meteleva-Fischer, Materials innovation institute M2i; Shadia Ikhmayies, Al Isra University; Arief Budiman, Singapore University of Technology and Design

Monday AM March 16, 2015 Room: Grand Harbor Salon 1 Location: Yacht & Beach

Session Chair: Gabriella Tranell, Norwegian University of Science & Technology

8:30 AM Introductory Comments

8:35 AM

Directional Growth of Bulk Silicon from Silicon-Aluminim-Tin Melts: *Yaqiong Li*¹; Yi Tan¹; Kazuki Morita²; ¹Dalian University of Technology; ²The University of Tokyo

8:55 AM

Towards Solar Silicon by Direct Carbothermic Reduction - An Experimental Approach and Theoretical Studies using Carbosil Briquettes: *Jan-Philipp Mai*¹; Jean-Claude Fischer²; ¹JPM Silicon GmbH; ²R&D Carbon Ltd.

9:20 AM

Boron Removal from Molten Silicon by H2-H2O Gas: *Jafar Safarian*¹; Kai Tang¹; Jan Erik Olsen¹; Kjetil Hildal²; Gabriella Tranell³; ¹SINTEF; ²ELKEM AS; ³NTNU

9:45 AM

Mechanism of Solid Silicon Contamination in a Graphite-Moisture Environment: *Yulia Meteleva-Fischer*¹; Amarante Böttger²; Wim Sloof²; Bert Kraaijveld³; ¹Materials Innovation Institute M2i; ²Delft University of Technology; ³RGS Development B.V.

10:10 AM Break

10:30 AM

Investigation on Mechanism and Kinetics of Electrochemical Reduction of SiO2 Granules in Molten CaCl2: *Xiao Yang*¹; Kouji Yasuda¹; Toshiyuki Nohira¹; Rika Hagiwara¹; Koki Ichitsubo²; Kenta Masuda²; Takayuki Homma³; ¹Kyoto University; ²Taiheiyo Cement Corporation; ³Waseda University

10:55 AM

Preparation of Solar Grade Silicon Precursor by SiO2 Electrolysis in Molten Salts: Liangxing Li¹; Jin-zhao Guan¹; *Ai-min Liu*¹; Zhong-ning Shi¹; Michal Korenko²; Jun-li XU¹; Bing-liang Gao¹; Zhao-wen Wang¹; ¹Northeastern University; ²Slovak Academy of Sciences

11:15 AM

Understanding Membrane Stability Issues in the SOM Process for Silicon Production: JiaPeng Xu¹; Yihong Jiang¹; Uday Pal¹; *Soumendra Basu¹*; ¹Boston University

11:40 AM

Following the Reaction Mechanisms of Silicon Production by μ CT Analysis: *Jan-Philipp Mai*¹; Raabe Gabriele²; ¹JPM Silicon GmbH; ²University of Braunschweig - Institute of Technology, IfT

12:05 PM

Effect of Temperature in Extraction of High Purity Amorphous Silica from Rice Husk for Silicon Production: *Chukwunwendu Ilochonwu*¹; Ifeanyichukwu Onyenanu²; Emmanuel Nwonye¹; Christian Nwajagu¹; ¹SEDI-Enugu; ²Anambra State University
MONDAY PM

Sustainable Energy and Layered Double Hydroxides

Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division (formerly EMPMD), TMS: Chemistry and Physics of Materials Committee

Program Organizers: Andrew Gomes, Lamar University; Christian Ruby, Université de Lorraine

Monday AM	Room: Asbury B
March 16, 2015	Location: Yacht & Beach

Session Chairs: Andrew Gomes, Lamar University; Christian Ruby, Université de Lorraine

8:30 AM Introductory Comments

8:35 AM Invited

Technical Innovation and Entrepreneurial Potential of "Hydrotalcite Like" Materials: David Cocke¹; Andrew Gomes; ¹Lamar University

9:00 AM

An Efficient and Economically Viable Method for Black Direct Dye Removal Using Layered Double Hydroxides: *Aparecida Mageste*¹; Renata Fidellis¹; Anderson Dias¹; Kisla Siqueira¹; ¹Universidade Federal de Ouro Preto

9:20 AM

Dephosphatation of Waste Water by using Ferric Oxyhydroxides and CaII-FeIII Layered Double Hydroxides: Christian Ruby¹; ¹Université de Lorraine

9:45 AM

Layered Double Hydroxides in Energy Research: Advantages and Challenges: *Andrew Gomes*¹; David Cocke¹; Doanh Tran²; Arnab Baksi¹; ¹Lamar University; ²GE Power and Water

10:10 AM Break

10:40 AM

Modelling The Structure And Vibrational Properties Of Layered Double Hydroxides: Erwan Andre¹; Jean Fahel¹; *Cedric Carteret*¹; ¹Lorraine University

11:00 AM

Structure and Reactivity of Intercalated Amino-acids Into Layered Double Hydroxides: Jean Fahel¹; Erwan André¹; *Cédric Carteret*¹; ¹Lorraine University

11:20 AM

Synthesis of Hydrotalcite-Like Compounds from Blast Furnace Slag: The Effect of Synthesis Parameters on Structure and Crystallinity: *Maocheng He*¹; Jianliang Zhang¹; Zhiwen Shi¹; Feng Liu¹; Xinyu Li¹; ¹University of Science and Technology Beijing

2015 Functional Nanomaterials: Energy and Sensing — Energy Conversion and Storage II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee

Program Organizers: Jung-Kun Lee, University of Pittsburgh; Behrang Hamadani, National Institute of Standards and Technology; Sung Hun Wee, HGST, a Western Digital Company; Nitin Chopra, University of Alabama, Tuscaloosa; Terry Xu, The University of North Carolina at Charlotte; Jang-Sik Lee, Pohang University of Science and Technology (POSTECH)

Monday PM March 16, 2015 Room: Swan 4 Location: Swan

Session Chair: Behrang Hamadani, National Institute of Standards and Technology

2:00 PM Invited

Heteroepitaxial Cu₂O on Single-Crystal-Like, Metallic Substrates: A Potential Route Towards Non-Toxic, Earth-Abundant Solar Cells: *Amit Goyal*¹; Sung-Hun Wee¹; Jun-Kun Lee²; ¹Oak Ridge National Laboratory; ²University of Pittsburgh

2:40 PM

Energy Storage Utilizing Advanced CVD Nano-Diamond Technology: *Stephen Minden*¹; John Fraley¹; Lauren Kegley¹; Jim Davidson²; David Kerns²; ¹APEI Inc.; ²International FemtoScience, Inc.

3:00 PM Invited

Material Synthesis, Device Operation, and Charge-Carrier Dynamics of Perovskite Solar Cells: Yixin Zhao¹; Alexandre Nardes¹; *Kai Zhu*¹; ¹National Renewable Energy Laboratory

3:40 PM Break

3:55 PM

Enhanced Electrical Properties of AZO films Containing Cu-Ni Nanoparticles for Transparent Conducting Oxide: *Po-Shun Huang*¹; Jung-Kun Lee¹; ¹University of Pittsburgh

4:15 PM

Reduced Graphene Oxide as a Coating Layer for Al Bipolar Plates: *Haneul Jang*¹; Hyunjoo Choi¹; Hyejung Chang²; ¹Kookmin University; ²Advanced Analysis Center, Korea Institute of Science and Tecnology

4:35 PM Invited

Thermodynamics and Electrochemistry of Bimetallic Electrodes for High Temperature Energy Storage: *Hojong Kim*¹; ¹Pennsylvania State University

5:15 PM

Synthesis of Alloy and Pure Metallic Nanoparticles by Novel Electromagnetic Levitation Melting Technique: Armin Vahid Mohammadi¹; Mehrnaz Mojtabavi²; Mohammad Halali³; ¹Florida International University; ²Stony Brook University; ³Sharif University of Technology

6th International Symposium on High Temperature Metallurgical Processing — Fundamental Research of Metallurgical Process I

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Gerardo Alvear, Xstratatech; Onuralp Yucel, Istanbul Technical University; Xinping Mao, Wuhan Iron and Steel Corporation; Hong Yong Sohn, University of Utah; Naiyang Ma, ArcelorMittal; Phillip Mackey, P.J. Mackey Technology; Tom Battle, Midrex Technologies

Monday PM	Room: Swan 5
March 16, 2015	Location: Swan

Session Chairs: Gerardo Alvear Flores, Xstratatech; Ting'an Zhang, North East University

2:00 PM

Example of the Refractory Corrosion Test Work with Nickel Matte: *Dean Gregurek*¹; Angelika Ressler¹; Alfred Spanring¹; Christoph Pichler²; ¹RHIAG; ²University of Leoben, CD Laboratory

2:20 PM

Effects of Functional Additives on the SHS of Boron Carbide: Onuralp Yucel¹; Hasan Ozer¹; Murat Alkan¹; *Ahmet Turan*²; ¹Istanbul Technical University; ²Yalova University

2:40 PM

High Temperature Softening Behaviours of Iron Blast Furnace Feeds and Their Correlations to the Microstructures: *Mao Chen*¹; Weidong Zhang²; Zhixing Zhao²; Dongqing Wang²; Tim Evans³; Baojun Zhao¹; ¹University of Queensland; ²Shougang Research Institute of Technology, Shougang Group; ³Rio Tinto Iron Ore

3:00 PM

Sintering Behavior of Pelletizing Feed in Composite Agglomeration Process (CAP) of Iron Ore Fines: *Zhengwei Yu*¹; Ruijun Wang¹; Feng Zhou¹; Yuanbo Zhang¹; Guanghui Li¹; Tao Jiang¹; ¹School of Minerals Processing and Bioengineering, Central South University

3:20 PM

Effect of Anodic Polarization on Layer-Growth of Ni-Fe-Cr Anodes in Cryolite-Alumina Melts: *Germain Kouma Ndong*¹; Luxing Feng¹; Jilai Xue¹; Jun Zhu¹; ¹USTB

3:40 PM Break

4:00 PM

Influence of Mineralogy on Metallurgical Properties of Lump Ore: Pan Jian¹; Yu Hong-bin¹; Zhu De-qing¹; Hu Xun¹; Yanhong Luo¹; ¹Central South University

4:20 PM

Study on The Reduction Mechanism of Liquid Lead Slag: Weifeng $\mathrm{Li}^{1};$

*Jing Zhan*²; Lihua Jiang³; Chuanfu Zhang²; Jucai Di¹; Shi-yan Xu¹; ¹(5. Henan Yuguang Gold & Lead Co., Ltd.; ²Central South University; ³Jiyuan Vocanionala and technical College

Additive Manufacturing: Interrelationships of Fabrication, Constitutive Relationships Targeting Performance, and Feedback to Process Control — Modeling of Additive Manufacturing

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; David Bourell, University of Texas at Austin; Reginald Hamilton, Pennsylvania State University; James Sears, GE Global Research Center; Allison Beese, Pennsylvania State University; Rajiv Mishra, University of North Texas

Monday PM	Room: Northern Hemisphere A1
March 16, 2015	Location: Dolphin

Session Chairs: Richard Fonda, Naval Research Laboratory; Deepankar Pal, University of Louisville

2:00 PM Invited

A New and Efficient Multi-Scale Simulation Architecture for Prediction of Performance Metrics for Parts Fabricated Using Additive Manufacturing: *Deepankar Pal*¹; Brent Stucker²; ¹University of Louisville; ²University of Louisville, 3DSIM LLC

2:30 PM

Phase-field Modeling of Microstructure Evolution in Electron Beam Additive Manufacturing: Xibing Gong¹; Kevin Chou¹; ¹The University of Alabama

2:50 PM

FEA Modeling and X-ray Measurement of Residual Stress and Distortion in the Direct Metal Laser Sintering Additive Manufacturing: *Li Ma*¹; Lyle Levine¹; ¹NIST

3:10 PM

Modeling the Process of Electron Beam Additive Manufacturing on the Performance of Ti-6Al-4V: *Brian Hayes*¹; Iman Ghamarian¹; Wendy Grogg¹; Thomas Ales¹; Pete Collins¹; ¹University of North Texas

3:30 PM Break

3:50 PM

DMLS Process Modelling & Validation: *Mustafa Megahed*¹; Narcisse N'Dri¹; Hans-Wilfried Mindt¹; Brian Shula¹; Alonso Peralta-Duran²; Peter Kantzos²; James Neumann²; ¹ESI Group; ²Honeywell Aerospace

4:10 PM

Computational Modeling and Experimental Study on the Ti Alloys Manufactured by LENS Process: *Wei Xiong*¹; Fuyao Yan¹; Gregory Olson¹; ¹Northwestern University

4:30 PM

Microstructural Investigation of LENS Processed 316L Stainless Steel: *Fuyao Yan*¹; Wei Xiong¹; Greg Olson¹; ¹Northwestern University

4:50 PM

In-situ Shelling via Selective Laser Melting: Microstructural Characterisation and Modelling: Chunlei Qiu¹; Nicholas Adkins¹; Hany Hassanin¹; Khamis Essa¹; Moataz Attallah¹; ¹The University of Birmingham

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Plasticity Induced Transformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee *Program Organizers:* Rodney McCabe, Los Alamos National Laboratory; John Carpenter, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Khalid Hattar, Sandia National Laboratory; Irene Beyerlein, Los Alamos National Laboratory; Wolfgang Pantleon, Technical University of Denmark

Monday PM	Room: Pelican 2
March 16, 2015	Location: Swan

Session Chairs: Daniel Kiener, University of Leoben; Shraddha Vachhani, Los Alamos National Laboratory

2:00 PM Invited

Application of Precession Electron Diffraction in Understanding IndentationI-Induced Grain Growth in Nanocrystalline Metals: *Gregory Thompson*¹; Justin Brons²; Jelani Hardwick¹; Xioa-xiang Yu¹; Henry Padilla³; Khalid Hattar³; Ryan Ott⁴; Brad Boyce³; ¹University of Alabama; ²Seagate; ³Sandia National Laboratories; ⁴Ames Laboratory

2:30 PM

In-Situ Studies of Retained Austenite Transformation in Multiphase Steels: *Whitney Poling*¹; Louis Hector²; Raj Mishra²; Anil Sachdev²; ¹Colorado School of Mines; ²GM Research & Development

2:50 PM

Martensite Nucleation and Growth Investigated by In-Situ Deformation Experiments, High Resolution EBSD and Microscopic Digital Image Correlation: *Dingshun Yan*¹; Cem Tasan¹; Satyapriya Gupta²; Anxin Ma²; Alexander Hartmaier²; Dierk Raabe¹; ¹Max-Planck-Institut für Eisenforschung GmbH; ²Interdisciplinary Centre for Advanced Materials Simulation, Ruhr-Universität Bochum

3:10 PM

Evolution of Lattice Strain and Phase Transformation of Super-Elastic Nitinol during Cyclic Tension: *Song Cai*¹; J Schaffer¹; Y Ren²; ¹Fort Wayne Metals Research Products Corp.; ²Argonne National Laboratory

3:30 PM Break

3:50 PM

Electron Backscatter Diffraction and Nanoindentation Studies of Dual-Phase Polycrystalline Shape Memory Alloys: *Rebecca Dar*¹; Ying Chen¹; ¹RPI

4:10 PM

3-D Characterization of Pre and Post-Deformation Lamellae Ti-6Al-4V Using High Energy X-ray Diffraction Microscopy: *Euan Wielewski*¹; David Menasche¹; Patrick Callahan¹; Robert Suter¹; ¹Carnegie Mellon University

4:30 PM

Damage Detection Using Acoustic Emission Technique for 304 Stainless Steel: *Patricio Carrion*¹; Pratik Parajuli¹; Jonathan Pegues¹; Marcos Lugo¹; Nima Shamsaei¹; ¹CAVS

4:50 PM

Grain Morphology Evolution in Strontium Titanate via Quantitative Correlative 3D Analysis Using TriBeam and Diffraction Contrast Tomography: *McLean Echlin*¹; William Lenthe¹; Andreas Trenkle²; Melanie Syha³; Peter Gumbsch²; Tresa Pollock¹; ¹University of California Santa Barbara; ²KIT; ³ESRF

Advanced Composites for Aerospace, Marine, and Land Applications II — Metal Matrix Composites

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Tomoko Sano, US Army Research Laboratory; Tirumalai Srivatsan, The University of Akron

Monday PM March 16, 2015 Room: Asia 5 Location: Dolphin

Session Chairs: Jonathan Spowart, Air Force Research Laboratory; Alicia Ares, CONICET/FCEQyN-UNaM

2:00 PM

Influence of Reinforcement Content on Tensile Response and Fracture Behavior of an Aluminum Alloy Metal Matrix Composite: K. Manigandan¹; Zhencheng Ren¹; Jingyi Zhao¹; *Tirumalai Srivatsan*¹; ¹The University of Akron

2:20 PM

Mechanical Properties of Steel Encapsulated Metal Matrix Composites: Sean Fudger¹; ¹U.S. Army Research Laboratory

2:40 PM

The Evolution of Solid Powders in Liquid Aluminum at Low Temperature and the Effects of Ultrasound on It: Zhiwei Liu¹; Qingyou Han¹; ¹Purdue University

3:00 PM

Metal Matrix Composites Directionally Solidified: Alicia Ares¹; *Carlos Enrique Schvezov*²; ¹CONICET/FCEQyN-UNaM; ²IMAM (CONICET-UNaM)

3:20 PM Break

3:40 PM

A Small Solute Oxygen and Silicon Elements Enhancing Strength and Ductility of Pure Titanium Matrix Composite: *Katsuyoshi Kondoh*¹; Lei Jia¹; Takanori Mimoto¹; Junko Umeda¹; Hisashi Imai¹; ¹Osaka University

4:00 PM

Nanoparticulate Reinforced Aluminum Alloy Composites Produced by Powder Metallurgy Route: *Kaspar Kallip*¹; Lauri Kollo²; Marc Leparoux¹; Christopher Bradbury¹; ¹EMPA Swiss Federal Laboratories for Materials Science and Technology; ²Tallinn University of Technology

4:20 PM

Growth Kinetics of Magnesio-aluminate Spinel in Aluminum/Magnesium Lamellar Composite Interface: Yasser Ahmed¹; Bakr Rabeeh¹; ¹German University in Cairo

Advanced Materials and Reservoir Engineering for Extreme Oil & Gas Environments II — Environmental Influences of Downhole Alloys and Advanced Materials for Oil and Gas Applications II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee Program Organizers: Indranil Roy, Schlumberger; Xinghang Zhang, Texas A&M University; Ting Chen, West Virginia University; Greg Kusinski, Chevron; Jefferson Rodrigues, Petrobras; Hani Elshahawi, Shell Exploration & Production, Co.

Monday PM March 16, 2015 Room: Swan 7 Location: Swan

Session Chairs: Gregoire Jacob, Schlumberger; Xinghang Zhang, Texas A&M University

2:00 PM Keynote

Effect of the Volume Fraction and Distribution of the Rotated Cube Texture Component on Fracture Toughness in Pipeline Steels: *John Jonas*¹; Alexey Gervasyev²; Roumen Petrov²; Malcolm Gray³; ¹McGill University; ²Ghent University; ³Microalloyed Steel Institute

www.tms.org/TMS2015

2:25 PM

Nanostructured Materials: Addressing Corrosion and Cracking in Extreme Environments: *Indranil Roy*¹; Gregoire Jacob¹; Rashmi Bhavsar¹; Tony Collins¹; ¹Schlumberger

2:45 PM

Effect of Machine Hammer Peening Surface Treatment on Pitting Corrosion Behavior of Oil-Grade Alloy 718: *Ting Chen*¹; Xingbo Liu¹; Jeffrey Hawk²; Hendrik John³; Jing Xu³; Saadedine Tebbal⁴; ¹National Energy Technology Laboratory; West Virginia University; ²National Energy Technology Laboratory; ³Baker Hughes Inc; ⁴SET Laboratories Inc.

3:05 PM Invited

Nanostructuring Alloys For Oil and Gas Industry Applications: Terry Lowe¹; ¹Colorado School of Mines

3:30 PM Break

3:45 PM Keynote

Micromechanics of Hydrogen-Induced Fracture: From Experiments and Modelling to Prognosis: *Petros Sofornis*¹; Akihide Nagao²; Mohsen Dadfarnia³; Shuai Wang⁴; May Martin⁵; Brian Somerday⁶; Reiner Kirchheim⁷; Ian Robertson⁸; ¹Kyushu University; University of Illinois; ²Kyushu University; JFE Steel Corporation; ³Kyushu University; University of Illinois; ⁴Kyushu University; ⁵Georg-August-Universität Göttingen; ⁶Kyushu University; Sandia National Laboratories; ⁷Georg-August-Universität Göttingen; Sandia National Laboratories; ⁸Kyushu University; University of Wisconsin-Madison

4:10 PM Invited

Development of High Strength and Corrosion Resistant Nanostructured Ferritic Alloys for Oil & Gas Applications: *Shenyan Huang*¹; Richard DiDomizio¹; Raul Rebak¹; Reza Sharghi-Moshtaghin¹; Evan Dolley¹; Emanuele Pietrangeli²; ¹GE Global Research; ²GE Oil & Gas

4:35 PM Invited

High Temperature Shape Memory Alloys for Potential Applications in Oil and Gas Industry: *Ibrahim Karaman*¹; ¹Texas A&M University

5:00 PM

Corrosion Resistance of Fe-Based Amorphous and Nanocrystalline Alloys: *José Berger*¹; ¹PPGCEM-UFSCar

Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion III — Wide Bandgap Semiconductors : Growth, Processing, Devices, and Packaging

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee, TMS: Magnetic Materials Committee

Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael Lanagan, Penn State University; Michael McHenry, Carnegie Mellon University; Rachael Myers-Ward, Naval Research Laboratory; Clive Randall, Penn State University; Matthew Willard, Case Western Reserve University; Ty McNutt, APEI, Inc.

Monday PM	Room: Asbury A
March 16, 2015	Location: Yacht & Beach

Session Chairs: Rachael Myers-Ward, Naval Research Laboratory; Ty McNutt, APEI

2:00 PM Invited

Status of Large Diameter SiC Single Crystal Substrates for Semiconductor Applications: *Gary Ruland*¹; ¹II-VI

2:30 PM Invited

4H-SiC Epilayers for High Power Bipolar Device: *Jawad Ul Hassan*¹; Ian Booker¹; Robin Karhu¹; Louise Lilja¹; Ildiko Farkas¹; Pontus Stenberg¹; Olle Kordina¹; Peder Bergman¹; Seoyong Ha²; Erik Janzén¹; ¹Linköping University; ²LG Innotek

3:00 PM

Improved Performance in AlGaN/GaN Power HEMTs-on-Silicon by Use of Pulsed MOCVD Technique and Stress Engineering: *Jeff Leathersich*¹;

Puneet¹; Isra Mahaboob¹; Neil Newman¹; Jack Bulmer¹; Randy Tompkins²; Kenneth Jones²; F. (Shadi) Shahedipour-Sandvik¹; ¹College of Nanoscale Science and Engineering; ²US Army Research Lab

3:20 PM Break

3:40 PM Invited

Basic Mechanisms Affecting the Reliability of SiC Power MOSFETs: *Aivars Lelis*¹; ¹U.S. Army Research Laboratory

4:10 PM

Physics Based Simulation of 4H-SiC DMOSFET Structure Under Inductive Switching: *Bejoy Pushpakaran*¹; Stephen Bayne¹; Aderinto Ogunniyi²; ¹Texas Tech University; ²Army Research Laboratory

4:30 PM Invited

Advanced Materials for High Temperature, High Performance Wide Bandgap Power Modules: *Chad O'Neal*¹; Brad McGee¹; Brice McPherson¹; Jennifer Stabach¹; Richard Lollar¹; Brandon Passmore¹; ¹APEI

Advanced Materials in Dental and Orthopedic Applications — Session II

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Elizabeth Trillo, Southwest Research Institue; Grant Crawford, South Dakota School of Mines and Technology

Monday PM	Room: Swan 8
March 16, 2015	Location: Swan

Funding support provided by: Magnetic, and Photonic Materials Division

Session Chairs: Luís Rocha, Sao Paulo State University-UNESP; Ana Ribeiro, Inmetro; Tolou Shokuhfar, Michigan Technological University

2:00 PM Invited

Interplay Between Bio-Tribocorrosion and Osteoblastic Cells Cultured on Titanium Surfaces: *Luis Rocha*¹; A.R. Ribeiro²; M.J. Runa³; M.T. Mathew⁴; ¹Universidade Estadual Paulista – UNESP; ²Brazilian Branch of Institute of Biomaterials, Tribocorrosion and Nano-Medicine (IBTN/Br); National Institute of Metrology Quality and Technology; ³University of Minho; Institute of Biomaterials, Tribocorrosion and Nano-Medicine (IBTN); ⁴Institute of Biomaterials, Tribocorrosion and Nano-Medicine (IBTN); Rush University Medical Center

2:30 PM

Color Tone and Exfoliation Resistance of White Oxide Layer Formed on Ti-Nb-Ta-Zr Alloys: *Eri Miura-Fujiwara*¹; Yoshimi Watanabe²; Toshihiro Kasuga²; Mitsuo Niinomi³; ¹University of Hyogo; ²Nagoya Institute of Technology; ³Institute for Materials Research, Tohoku University

2:50 PM

Comparing the Adhesion Strength of a Chitosan Coating using Four Different Solvents: *Holly Martin*¹; Stephen Cornich¹; Kathryn Shields¹; ¹Youngstown State University

3:10 PM Invited

Multifunctional Nanotubes for Better Dental and Orthopedic Implants: *Tolou Shokuhfar*¹; ¹Michigan Technological University

3:40 PM Break

4:00 PM Invited

Innovative Multifunctional Calcium-Rich Surfaces for Dental Implant Applications: An Overview About Nanotoxicology Applied to Dental Implants: Ana Ribeiro¹; F. Oliveira¹; H. Cruz¹; J. Moscoso¹; L. Oliveira¹; R. Travassos¹; E. Santos¹; C.A. Achete¹; L.A. Rocha²; J.M. Granjeiro³; ¹National Institute of Metrology Quality and Technology; Brazilian Branch of Institute of Biomaterials, Tribocorrosion and Nanomedicine (IBTN); ²Brazilian Branch of Institute of Biomaterials, Tribocorrosion and Nanomedicine (IBTN); University of Minho; Universidade Estadual Paulista – UNESP; ³National Institute of Metrology Quality and Technology; Brazilian Branch of Institute of Biomaterials, Tribocorrosion and Nanomedicine (IBTN); Fluminense Federal University

4:30 PM

Characterization of Chitin for Bone Tissue Regeneration: Samson Adeosun¹; Ganiyu Ishola Lawal¹; Oluwashina Gbenebor¹; ¹University of Lagos

4:50 PM Invited

Effects of Air Abrasion Surface Treatments on the Fracture Behaviour of a Veneered Dental Zirconia Ceramic: Sheila Passos¹; Bernard Linke¹; Paul Major¹; John Nychka¹; ¹University of Alberta

Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu — Solidification Processing II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Laurentiu Nastac, The University of Alabama; Baicheng Liu, Tsinghua University; Hasse Fredriksson, KTH - Royal Institute of Technology; Jacques Lacaze, Université de Toulouse; Chun-Pyo Hong, Yonsei University; Adrian Catalina, Caterpillar Inc.; Andreas Buhrig-Polaczek, RWTH Aachen University; Daan Maijer, The University of British Columbia; Charles Monroe, University of Alabama at Birmingham; Adrian Sabau, Oak Ridge National Laboratory; Roxana Ruxanda, Emerson Climate Technologies; Alan Luo, The Ohio State University; Subhayu Sen, GEOCENT; Attila Diószegi, Jönköping University, School of Engineering

Monday PM	Room: Swan 6
March 16, 2015	Location: Swan

Session Chair: Charles Monroe, The University of Alabama at Birmingham

2:00 PM Invited

Modeling of Macrosegregation during Solidification of Steel Ingot Casting: Wutao Tu¹; Houfa Shen¹; *Baicheng Liu*¹; ¹Tsinghua University

2:25 PM

Scaling Analysis of Alloy Solidification and Flow in a Rectangular Cavity: *Alex Plotkowski*¹; Kyle Fezi¹; Matthew Krane¹; ¹Purdue University

2:45 PM

Casting Solidification of Near-Congruent Binary Alloys: *Kevin Chaput*¹; Kevin Trumble¹; ¹Purdue University

3:05 PM

Improvement of Micro-Structure and Mechanical Properties in the Hyper-Eutectic Al-Si Cast Alloys Through Barium Additions: Ganpat Rai¹; *D. Benny Karunakar*¹; ¹Indian Institute of Technology Roorkee

3:25 PM

Interfacial Evolution of Heusler Mn50Ni40In10 Unidirectional Crystal: Jian Ren¹; Jinke Yu¹; Hongwei Li¹; Hongxing Zheng¹; ¹Laboratory for Microstructures, Shanghai University

3:45 PM Break

4:05 PM Invited

Structure and Casting Defects of Aluminum Billets Produced by Direct-Chill Casting: Dmitry Eskin¹; ¹Brunel University

4:30 PM

The Fluid Flow and Solidification Phenomenon in Billet Continuous Casting Process with Mold and Final Electromagnetic Stirrings: *Dongbin Jiang*¹; Miaoyong Zhu¹; ¹Northeastern University

4:50 PM

Columnar-to-Equiaxed Transition in Zn-27wt.Al Alloys: A Comparation between Vertical and Horizontal Directional Solidifications: Alicia Ares¹; *Carlos Enrique Schvezov*²; ¹CONICET/FCEQyN-UNaM; ²IMAM (CONICET-UNaM)

5:10 PM

Evaluation of the Casting/Chill Interface Thermal Behaviour during A319 Alloy Sand Casting Process: *Farzaneh Farhang Mehr*¹; Steve Cockcroft¹; Carl Reilly¹; Daan Maijer¹; ¹UBC

Advances in Thin Films for Electronics and Photonics — 2D Materials vs. Silicon

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee

Program Organizers: Federico Rosei, INRS; Nuggehalli Ravindra, New Jersey Institute of Technology; Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Terry Alford, Arizona State University

Monday PM March 16, 2015 Room: Europe 7 Location: Dolphin

Session Chair: Tatiana Martins, UFG

2:00 PM Invited

Amorphous Boron Based Nanosheets: Rajen Patel¹; Zafar Iqbal¹; ¹NJIT

2:25 PM Invited

Laterally Grown Silicon Micro-Films on Amorphous Substrates: Nate Quitoriano¹; ¹McGill University

2:50 PM Invited

Nanopatterned Graphene with Controlled Electronic and Optical Properties: Sungho Jin¹; ¹UC San Diego

3:15 PM Invited

Synthesis and Characterization of 2D MoS₂/Graphene Heterostructure Field Effect Ttransistors: *Shanee Pacley*¹; Emory Beck-Millerton¹; Michael Jespersen¹; Jianjun Hu¹; Nicholas Glavin¹; Michael Check¹; Andrey Voevodin¹; ¹AFRL

3:40 PM Break

4:00 PM Invited

Engineering Light Absorption in Group IV Nanowire Heterostructures: Anis Attiaoui¹; *Oussama Moutanabbir*¹; ¹Ecole Polytechnque de Montreal

4:25 PM

Interfacial Assembling of Freestanding and Pinhole-free GO Thin Films: *Jiahua Zhu*¹; Long Chen¹; ¹The University of Akron

4:45 PM Invited

Multifunctional Carbon Nanotube Composites: Xin Wang¹; Qingwen Li²; Philip Bradford¹; *Yuntian Zhu*¹; ¹North Carolina State University; ²Suzhou Institute of Nanotechnology and Nanobionics

5:10 PM

Nano-Indentation Studies on Interface Adhesion of Thin Film Metallization in Silicon Integrated Circuits: *Ali Roshanghias*¹; Golta Khatibi¹; Rainer Pelzer²; Juergen Steinbrenner²; ¹University of Vienna; ²Infineon Technologies Austria

Alloys and Compounds for Thermoelectric and Solar Cell Applications III — Session II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Stéphane Gorsse, Bordeaux INP; Chih-Huang Lai, National Tsing Hua University; Yoshisato Kimura, Tokyo Institute of Technology; Ce-Wen Nan, Tsinghua University; G. Jeffrey Snyder, California Institute of Technology; Hsin-jay Wu, National Sun Yat-Sen University

Monday PM March 16, 2015 Room: Europe 5 Location: Dolphin

Session Chairs: Hsin-jay Wu, National Sun Yat-Sen University; Albert T. Wu, National Central University

2:00 PM Invited

Atomic-Scale Observations of Dislocation Core Structures in Bismuth Telluride: *Douglas Medlin*¹; N. Yang¹; K. Erickson¹; M. Siegal¹; G. Yelton¹; S. Limmer¹; ¹Sandia National Laboratories

2:25 PM Invited

Ab-Initio Calculations of the Lattice Thermal Conductivity: Laurent Chaput¹; ¹Institut Jean Lamour

2:50 PM Invited

The Study of Joint Strength for Pb-Free Solder and Bi₂Te₃ Thermoelectric Material: *Albert T. Wu*¹; Neng-Yi Lin¹; ¹National Central University

3:15 PM

Effects of Silver Doping on Crystal Defects and Transport Properties of N-Type Bismuth Selenium Telluride Compounds Prepared by Powder Metallurgy: *Meng-Pei Lu*¹; Chien-Neng Liao¹; ¹National Tsing Hua University

3:35 PM Break

3:55 PM Invited

Formation of [010]-Oriented Sb2Se3 Crystals via Vapor-Liquid-Solid (VLS) Process: The Crystal Structure and Thermal Power: *Hsin-Jay Wu¹*; Sinn-wen Chen²; ¹National Sun Yat-sen University; ²National Tsing Hua University

4:20 PM Invited

Power Output Dependence on ZT and Power Factor of Thermoelectric Materials: *Zhifeng Ren*¹; ¹Boston College

4:45 PM Invited

Interfacial Reactions in Thermoelectric Devices: Sinn-wen Chen¹; Wei-an Chen¹; Ting-ruei Yang¹; Po-han Lin¹; ¹National Tsing Hua University

5:10 PM

Assembly of Highly Effective Bonding Layers for PbTe Thermoelectric Materials Using Rapid Hot-Pressing Method: C.C. Li¹; F. Drymiotis²; L.L. Liao³; M.J. Dai³; C.K. Liu³; C.R. Kao¹; G.J. Snyder²; ¹National Taiwan University; ²California Institute of Technology; ³Industrial Technology Research Institute

Alumina and Bauxite — Bauxite and Beneficiation

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Hans-Werner Schmidt, Outotec GmbH

Monday PM March 16, 2015 Room: Southern Hemisphere IV Location: Dolphin

Session Chair: James Metson, The University of Auckland

2:00 PM Introductory Comments

2:10 PM

SGA Specifications from the Perspective of Smelting Customers: Stephen Lindsay¹; ¹Alcoa, Inc.

2:35 PM

Theory and Practice of Bauxite X-ray Sorting: Andrey Panov¹; Gennadiy Klimentenok¹; Vladimir Shemyakin²; ¹RUSAL Engineering & Technology Centre; ²NPK "Technogen"

3:00 PM

Roasting Pretreatment on High-Sulfur Bauxite with Low-Median Grade in Chongqing China: *Jianguo Yin*¹; Mingrong Han¹; Wenqiang Yang¹; Juan An¹; Xuejiao Zhou¹; Wentang Xia¹; Liwen Huang¹; ¹Chongqing University of Science and Technology

3:25 PM Break

3:40 PM

Improving Characterization of Low Grade Elburz Bauxite to be Utilize in Jajarm Alumina Plant: *Mohammadtaghi Shadloo*¹; Mohammad Zarbayani²; ¹Iran Alumina Co.; ²General mechanic Company

4:05 PM

Bauxite Beneficiation Modifying Factors: A Case Study: Caio van Deursen¹; ¹Votorantim Metais

4:30 PM Question and Answer Period

5:00 PM Concluding Comments

Aluminum Alloys: Development, Characterization, and Applications — Material Characterization

Sponsored by: TMS Light Metals Division, TMS: Aluminum Processing Committee Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix,LLC; Tongguang Zhai, University of Kentucky

Monday PM	Room: Northern Hemisphere E3
March 16, 2015	Location: Dolphin

Session Chairs: Knut Marthinsen, Norwegian University of Science and Technology; Ramasis Goswami, Naval Research Laboratory

2:00 PM Keynote

The Influence of Microchemistry and Processing Conditions on the Softening Behavior of Cold-Rolled Al-Mn-Fe-Si Alloys: *Knut Marthinsen*¹; ¹Norwegian University of Science and Technology

2:35 PM Invited

Effects of Zr and V Micro-alloying on Activation Energy during Hot Deformation of 7150 Aluminum Alloys: Cangji Shi¹; X. Grant Chen¹; ¹University of Quebec at Chicoutimi

2:55 PM Invited

Microstructure Evolution in Al-Mg Alloys during and After Hot Deformation: *Raul Perez-Bustamante*¹; Ryann Rupp¹; Andrew Weldon¹; Trevor Watt¹; Ken Takata¹; Eric Taleff¹; ¹The University of Texas at Austin

3:15 PM

Modified Microalloying Aluminum-Scandium-Based Alloys for High-Temperature Applications: David Seidman¹; Nhon Vo²; David Dunand¹; ¹Northwestern University; ²NanoAl LLC

3:35 PM Break

3:50 PM

The Effect of Vanadium Addition on Structure and Material Properties of Heat Treated 6xxx Series Aluminium Alloys: *Marzena Lech-Grega*¹; Wojciech Szymanski¹; Sonia Boczkal¹; Maciej Gawlik¹; Mariusz Bigaj¹; ¹Institute of Non-Ferrous Metals

4:10 PM

Mechanical Properties of Al-(8,10)%Zn-2%Mg-2%Cu Base Alloys Processed with High-Pressure Torsion: *Ichiro Aoi*¹; Shigeru Kuramoto¹; Keiichiro Oh-ishi¹; ¹Toyota Central R&D Labs., Inc.

Aluminum Processing — Session I

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: John Griffin, ACT LLC

Monday PMRoom: Southern Hemisphere IMarch 16, 2015Location: Dolphin

Session Chair: John Courtenay, MQP Ltd

2:00 PM

Prioritizing Water Contaminants' Impact on Heat Transfer in Casting Aluminum Ingots.: *Robert Baxter*¹; Stephen Wood¹; John Gast¹; ¹Ashland Water Technologies

2:25 PM

Direct Flame Impingement: A New Oxy-Fuel Based Technology for Continuous Annealing of Aluminium Strip: *Henrik Gripenberg*¹; Rudiger Eichler¹; ¹Linde Gas

2:50 PM

Aluminum Surface Texturing by Means of Laser Interference Metallurgy: Jian Chen¹; Adrian Sabau¹; Jonaaron Jones²; Alexandra Hackett²; Claus Daniel¹; Charles Warren¹; ¹Oak Ridge National Lab; ²University of Tennessee

3:15 PM Break

3:30 PM

Novelis do Brazil High-Speed Can End Coating Line – Operational Results: *Anthony Tropeano*¹; Trajano Roque Neto²; ¹FATA Hunter, Division of FATA SpA; ²Novelis de Brasil

Aluminum Reduction Technology — Cell Technologies and Design

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pascal Lavoie, LMRC

Nonday PM	Room: Southern Hemisphere III
March 16, 2015	Location: Dolphin

Session Chair: Geoff Bearne, Rio Tinto Technology and Innovation

2:00 PM Introductory Comments

2:05 PM

Simulation and Measurements on the Flow Field of 600kA Aluminum Reduction Pot: Wei Liu¹; Dongfang Zhou¹; Yafeng Liu¹; Ming Liu¹; Xiaodong Yang¹; ¹SAMI

2:30 PM

CHINALCO 600kA High Capacity Low Energy Consumption Reduction Cell Development: *Dongfang Zhou*¹; Xiaodong Yang¹; Ming Liu¹; Wei Liu¹; ¹Shenyang Aluminium & Magnesium Engineering & Research Institute Co. Ltd

2:55 PM

Development History and Performance of Dubal DX+ Demonstration Cells: Ali Al Zarouni¹; Abdalla Zarouni¹; *Nadia Ahli*¹; Sergey Akhmetov¹; Michel Reverdy¹; Munawar Hussain²; Konstantin Nikandrov²; Lalit Mishra²; ¹DUBAL; ²Emirates Global Aluminium (EGA)

3:20 PM

Arvida Aluminum Smelter - AP60 Technological Center, Start-up Performance and Development of the Technology: *Martin Forté*¹; Martin Robitaille¹; Nicolas Gros¹; René Gariepy¹; Isabelle Mantha¹; Louis Lefrançois²; Jean-Pierre Figue³; ¹Rio Tinto Alcan, Arvida Research and Development Centre; ²Rio Tinto Alcan, Arvida Aluminium Smelter; ³Rio Tinto Alcan

3:45 PM Break

4:00 PM

From D18 to D18+: Progression of Dubal's Original Potlines: *Daniel Whitfield*¹; Sergey Akhmetov¹; Maryam Mohammad Al-Jallaf¹; Jose Blasques¹; Kamel Al-Aswad¹; Ibrahim Baggash¹; ¹Dubai Aluminium PJSC

4:25 PM

World's Longest Potline Start-Up at EMAL: Walid Alsayed¹; Abdulla Al Riyami¹; Mohamed Al Hammadi¹; *Ibrahim Al Ali*¹; Vijayakumar Pillai¹; Ali H. A. M. Al Zarouni²; Akhmetov Sergey²; Michel Reverdy²; Nadia Ahli²; ¹Emirates Global Aluminium, Al Taweelah Operations, PB No. 111023, Abu Dhabi, UAE; ²Emirates Global Aluminium, Jebel Ali Operations, PB No. 3627, Dubai, UAE

4:50 PM

Technology Research on Aluminum Reduction Cell Pre-Stressed Shell : *Pu Zheng*¹; Wei Wang¹; ¹Guiyang Aluminum Magnesium Design and Research Institute Company Limited

5:15 PM

Investment Advantages of the Establishing of Aluminium Clusters: Serguey Akhmedov¹; Vadim Kozlov¹; ¹ALCORUS Co Ltd

Biological Materials Science Symposium —

Characterization of Natural and Biological Materials Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Kalpana Katti, North Dakota State University; Rajendra Kasinath, DePuy Synthes Products, LLC; Michael Porter, Clemson University; Francois Barthelat, McGill University

Monday PMRoom: Swan 9March 16, 2015Location: Swan

Session Chairs: Francois Barthelat, McGill University; Rajendra Kasinath, DePuy Synthes Products, LLC

2:00 PM Invited

Deformation and Fracture in Human Cortical Bone: Roles of Strain Rate, Irradiation Aging and Disease: *Robert Ritchie*¹; Elizabeth Zimmermann²; Bernd Gludovatz³; Hrishikesh Bale¹; Holly Barth⁴; Claire Acevedo³; Alessandra Carriero⁵; Björn Busse²; ¹University of California Berkeley; ²University Medical Center Hamburg; ³Lawrence Berkeley National Laboratory; ⁴Lawrence Livermore National Laboratory; ⁵Imperial College

2:30 PM

Application of Similitude and Scaling Relationships to Analyze the Structural Response of Novel Bio Inspired (Paddlefish Rostrum) Materials Under Extreme Loading Conditions: *Guillermo Riveros*¹; Reena Patel¹; Wayne Hodo¹; Jan Hoover¹; Jeremiah JDeang²; Mark Horsemayer²; ¹US Army; ²Mississippi State University

2:50 PM

Combining Acoustic and Spectroscopic Measurement to Characterization Biological Entities: *Eric Lesniewska*¹; Pauline Vitry¹; Alexandre Dazzi²; Laurène Tétard³; Eric Bourillot¹; ¹University of Bourgogne; ²University Paris Sud; ³University of Central Florida

3:10 PM

Depth-Sensing Nanoindentation and Synchrotron Based XRF and XRD Investigation of Tungsten Exposed Bio-Monitoring Systems, Gastropod (Otala Lactea) Shells: Paul Allison¹; Jen Seiter²; Alfredo Diaz³; Jay Lindsay²; Robert Moser²; R.V. Tappero⁴; Alan Kennedy²; Omar Rodriguez⁵; ¹US Army Engineer Research & Development Center ; ²US Army Engineer Research & Development Center; ³University of Puerto at Mayaguez; ⁴National Synchrotron Light Source at Brookhaven National Laboratory; ⁵University of Alabama

3:30 PM Break

3:40 PM

Experimental Characterization of Bone and Exoskeleton Fish Scale Structures: Wayne Hodo¹; *Kenneth Livi*²; Jennifer Seiter¹; Brandon Lafferty¹; Mark Chappell¹; Paul Allison¹; Trevan Landin³; Cedric Bouchet-Marquis³; ¹ERDC; ²John Hopkins University; ³North America NanoPort, FEI Company

4:00 PM Invited

MONDAY PM

Investigation of Biological and Biomimetic Composites: Nicholas Yaraghi¹; Enrique Escobar de Obaldia²; Nobphadon Suksangpanya²; Chris Salinas¹; Steven Herrera¹; Pablo Zavattieri²; *David Kisailus*¹; ¹University of California at Riverside; ²Purdue University

4:30 PM

Biochemical Characterisation of the Leaf of *Morinda Lucida*: Prospects for Environmentally Friendly Steel Rebar Corrosion-Protection in Aggressive Medium: *Joshua Okeniyi*¹; Olubanke Ogunlana¹; Oluseyi Ogunlana²; Taiwo Owoeye¹; Elizabeth Okeniyi¹; ¹Covenant University, Ota, Nigeria; ²Crawford University, Igbesa, Nigeria

4:50 PM

In Vitro Studies of Surface Modified Highly Porous Ti6Al7Nb Alloys: *Ezgi Butev*¹; Ziya Esen¹; Sakir Bor²; ¹Cankaya University; ²Middle East Technical University

5:10 PM

Magnetic Alignment of Ice Templated Ceramics: *Michael Porter*¹; Marc Meyers²; Joanna McKittrick²; ¹Clemson University; ²University of California San Diego

Bulk Metallic Glasses XII — Alloy Development and Application II

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Hahn Choo, Univ of Tennessee; Yanfei Gao, University of Tennessee

Monday PM	Room: Asia 4
March 16, 2015	Location: Dolphin

Session Chairs: Jan Schroers, Yale University; Atakan Peker, Washington State University

2:00 PM Invited

Structure-Property-Processing Relationships in Metallic Glasses: *Jan Schroers*¹; Yanhui Liu¹; Yanglin Li¹; Sungwoo Sohn¹; Katharine Jensen¹; ¹Yale University

2:25 PM

Extrusion of Bulk Metallic Glass in the Supercooled Liquid Region: *Gregory Duggan*¹; David Jarvis²; Wayne Voice²; Nicholas Lavery³; David Browne¹; ¹University College Dublin; ²European Space Agency; ³Swansea University

2:45 PM Invited

Bulk Metallic Glass - A Superior Erosion and Cavitation Resistant Material: Harpreet Arora¹; Ayyagari Aditya¹; *Sundeep Mukherjee*¹; ¹University of North Texas

3:10 PM Invited

Bulk Metallic Glasses: Scale-Up and Applications: *Atakan Peker*¹; ¹Washington State University

3:35 PM Break

3:50 PM Invited

Cu-based Glassy Nano Wire Fabrication: *Y. Yokoyama*¹; K. S. Nakayama²; S. Yaginuma²; S. Tsukimoto²; J. Okada³; T. Ishikawa³; ¹IMR, AIMR-WPI, Tohoku University; ²AIMR-WPI, Tohoku University; ³Institute of Space and Astronautical Science

4:10 PM Invited

Fabrication of Amorphous Metal Composites and Foams via Equal Channel Angular Extrusion: Suveen Mathaudhu¹; ¹University of California Riverside

4:30 PM Invited

Nano vs. Temperature Effect: Brittle vs. Ductile Deformation in Nano-Sized Metallic Glasses: David Chen¹; S.W. Lee²; Julia Greer¹; ¹California Institute of Technology; ²University of Connecticut

4:50 PM

Interfacial Free Energy, Glass Forming Ability, Local Order of Liquid Metals: *Geun Woo Lee*¹; ¹Korea Research Institute of Standards and Science

5:10 PM Invited

A Research on the Glass-Forming Ability of High-Entropy Alloys: Ke-Fu Yao¹; Shaofan Zhao¹; Zhidong Han¹; Hongyu Ding¹; ¹Tsinghua University

5:30 PM Invited

Formation and Properties of P-Free Pd-Based Bulk Metallic Glasses with High Glass-Forming Ability: *Wei Zhang*¹; Hai Guo²; Shuli Ou¹; Yanhui Li¹; Shinichi Yamaura²; ¹School of Materials Science and Engineering, Dalian University of Technology; ²Institute for Materials Research, Tohoku University

CALPHAD-Based ICME Research for Materials Genomic Design — Materials Genome: ICME and CALPHAD-Based Materials Design 1

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Wei Xiong, Northwestern University; Shihkang Lin, National Cheng Kung University; Chao Jiang, Thermo-Calc Software Inc; Shenyang Hu, Pacific Northwest National Laboratory; Wen-dung Hsu, National Cheng Kung University; Sinn-wen Chen, National Tsinghua University; Shuanglin Chen, CompuTherm LLC

Monday PM	Room: Northern Hemisphere A2
March 16, 2015	Location: Dolphin

Session Chairs: Jiadong Gong, QuesTek Innovations; Shengyang Hu, Pacific Northwest National Laboratory; Wei Xiong, Northwestern University; Xiao-Gang Lu, Shanghai University

2:00 PM Keynote

Correlative Atom-Probe Tomographic and Simulation Studies Pertinent to Microstructural Evolution of Nickel-Based Alloys: *David Seidman*¹; ¹Northwestern University

2:35 PM Keynote

Multiscale Modeling of Precipitate Morphologies in Mg-RE Alloys: Yanzhou Ji¹; Ahmed Issa²; James Saal²; Chris Wolverton²; *Long Qing Chen*¹; ¹Pennsylvania State University; ²Northwestern University

3:10 PM

Phase Field Simulation on Dendritic Growth in Pressurized Solidification of Mg-Al Alloy: Haowei Pan¹; Zhiqiang Han¹; Alan Luo²; Baicheng Liu¹; ¹Tsinghua University; ²The Ohio State University

3:30 PM Break

3:45 PM

Phase Equilibria in Ternary Co-Al-W: Toward Accurate CALPHAD-Type Descriptions of Thermodynamic, Molar Volume, and Elastic Properties: *Eric Lass*¹; ¹NIST

4:05 PM Keynote

Investigation on Ferritic Superalloys with Improved Creep Resistance by Computational Design and Experimental Validation: *Peter Liaw*¹; Mark Asta²; BjØrn Clausen³; Hong Ding²; David Dunand⁴; Morris Fine⁴; Gautam Ghosh⁴; Shenyan Huang¹; Donovan Leonard⁵; Christian Liebscher²; Chain Liu⁶; Michael Rawlings⁴; Zhiqian Sun¹; Gian Song¹; Zhenke Teng¹; Nhon Vo⁴; Gongyao Wang¹; ¹University of Tennessee Knoxville; ²University of California Berkeley; ³Los Alamos National Laboratory; ⁴Northwestern University; ⁵Oak Ridge National Laboratory; ⁶City University of Hong Kong

4:40 PM Invited

Effective Exploration of Novel High-Temperature Steels for Advanced Ultrasupercritical Steam Turbines: *Changdong Wei*¹; Siwei Cao¹; Ji-Cheng Zhao¹; ¹The Ohio State University

5:10 PM

An *ab Initio*-Aided Experimental Investigation on W-Doped Li₄Ti₅O₁₂ Defect Spinel as Anodes for Li Ion Batteries: *Ping-chun Tsai*¹; Shih-kang Lin¹; Wen-Dung Hsu¹; ¹National Cheng Kung University (NCKU)

Cast Shop for Aluminum Production — Direct Chill Casting

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pete Forakis, STAS Middle East

Monday PMRoom: Northern Hemisphere E4March 16, 2015Location: Dolphin

Session Chair: Filippos Patsiogiannis, Bridgnorth Aluminium Ltd.

2:00 PM Introductory Comments

2:05 PM

On Liquid Metal Wetting of Casting Rings for DC Casting: *Nazlin Bayat*¹; Torbjörn Carlberg¹; ¹Mid Sweden University

2:30 PM

Thermal Stress Prediction in AA5182 Rectangular Ingots: *Yunbo Wang*¹; Matthew Krane¹; Kevin Trumble¹; ¹Purdue University

2:55 PM

Macrosegregation During Direct Chill Casting of Aluminum Alloy 7050: *Kyle Fezi*¹; John Coleman¹; Matthew Krane¹; ¹Purdue University

3:20 PM Break

3:35 PM

Experimental Observations of Macrosegregation in DC Casting of Rolling Slab Ingots: Samuel Wagstaff¹; Antoine Allanore¹; ¹Massachusetts Institute of Technology

4:00 PM

Development and Demonstration of a Flexible Ingot Mould Filling System: *Jean-Francois Desmeules*¹; ¹Dynamic Concept

Characterization of Materials through High Resolution Coherent Imaging — Coherent and Phase Contrast Imaging

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee Program Organizers: Ross Harder, Argonne National Lab; Richard

Sandberg, Los Alamos National Laboratory; Brian Abbey, La Trobe University; Xianghui Xiao, Argonne National Laboratory; John Carpenter, Los Alamos National Laboratory

Monday PM	Room: Macaw 2
March 16, 2015	Location: Swan

Session Chair: Xianhui Xiao, Argonne National Laboratory

2:00 PM Invited

Nano-Imaging with Ptychography: *Xiaojing Huang*¹; Hanfei Yan¹; Ray Conley¹; Nathalie Bouet¹; Juan Zhou¹; Evgeny Nazaretski¹; Kenneth Lauer¹; Ross Harder²; Julio Da Silva³; Ian Robinson⁴; Yong Chu¹; ¹Brookhaven National Laboratory; ²Advanced Photon Source; ³Swiss Light Source; ⁴London Centre for Nanotechnology

2:20 PM Invited

Nanobeam Ptychography of Integrated Circuits: David Vine¹; ¹Argonne National Lab

2:40 PM Invited

Observing Nanoscale Magnetostriction with Coherent X- rays in DC and Pulsed Magnetic Fields: *Edwin Fohtung*¹; Ross Harder²; Oleg Shpyrko³; Boris Kieffer⁴; Eric Fullerton³; ¹LANL/NMSU; ²Argonne National Lab; ³University of California San Diego; ⁴New Mexico State University

3:00 PM Invited

Three-Dimensional Bragg Coherent Diffractive Imaging Using Polychromatic X-rays: *Wonsuk Cha*¹; Stephan Hruszkewycz¹; Rebecca Sichel-Tissot¹; Matthew Highland¹; Ross Harder¹; Wenjun Liu¹; Jorg Maser¹; Paul Fuoss¹; ¹Argonne National Laboratory

3:20 PM Break

3:40 PM Keynote

Watching Microstructure Evolve using Phase Contrast X-ray Imaging: J.W. Gibbs¹; K.A. Mohan²; E.B. Gulsoy¹; A. Shahaini¹; X. Xiao³; C. Bouman²; M. DeGraef⁴; *Peter Voorhees*¹; ¹Northwestern University; ²Purdue University; ³Argonne National Laboratory; ⁴Carnegie Mellon University

4:10 PM

Three-Dimensional Atomic Resolution Tomography Reconstruction of Tilt Series: Xiangwen Lyu¹; Wenpei Gao¹; *Jian Min Zuo¹*; ¹University of Illinois

4:30 PM

In-Situ X-ray Imaging of Microstructural Evolution in Metallic Alloys during Directional Solidification: *Amy Clarke*¹; Paul Gibbs¹; Seth Imhoff¹; Damien Tourret¹; Younggil Song²; Kamel Fezzaa³; Wah-Keat Lee⁴; Alain Karma²; ¹Los Alamos National Laboratory; ²Northeastern University; ³Argonne National Laboratory; ⁴Brookhaven National Laboratory

4:50 PM Invited

X-ray Phase Contrast Tomography for Materials Characterisation: From Synchrotrons to the Lab: *Robert Bradley*¹; Philip Withers¹; ¹The University of Manchester

5:10 PM

Estimation of Amount of Recrystallization from Electron Backscatter Diffraction (EBSD) Data Using Grain Orientation Spread (GOS) Measurement: Harshavardhana Natarajan¹; Janamejay Nemade²; M. P. Gururajan¹; Prita Pant¹; ¹IIT Bombay; ²Crompton Greaves Limited

Characterization of Minerals, Metals, and Materials — Characterization of Welding and Solidification

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chenguang Bai, Chongqing University; Juan Pablo Escobedo, University of New South Wales; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Neves Monteiro, Military Institute of Engineering, IME, Materials Science Department; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal; Jian Li, CanmetMATERIALS

Monday PMRoom: Mockingbird 1March 16, 2015Location: Swan

Session Chairs: Pasquale Russo Spena, Free University of Bozen-Bolzano; Dhriti Bhattacharyya, ANSTO

2:00 PM

Laser welding between TWIP Steels and Automotive High-Strength Steels: *Pasquale Russo Spena*¹; Matteo Rossini¹; Luca Cortese¹; Paolo Matteis²; Giorgio Scavino²; Donato Firrao²; ¹Free University of Bozen-Bolzano; ²Politecnico di Torino

2:20 PM

Undercooling of Rapidly Solidified Droplets and Spray Formed Strips of Al-Cu (Sc): *Abdoul-Aziz Bogno*¹; Philipp Natzke¹; Shengze Yin¹; Hani Henein¹; ¹University of Alberta

2:40 PM

Thermophysical Property Measurement of Metallic Alloys in the Liquid Phase

- Experiments on the International Space Station: Rainer Wunderlich¹; Enrica Ricci²; Jacqueline Etay³; Livio Battezzati⁴; Kenneth Kelton⁵; Juergen Brillo⁶; Robert Hyers⁷; Douglas Matson⁸; Hans-Joerg Fecht¹; ¹Universität Ulm; ²CNR-IENI Genoa; ³CNRS-EPM Grenoble; ⁴Università di Torino; ⁵Washington University; ⁶DLR German Aerospace Center; ⁷University of Massachussetts; ⁸Tufts University

www.tms.org/TMS2015

3:00 PM

Investigation on Testing Methods of Selective Laser Melted 18Ni300 Maraging Powder: Jun Bao¹; Shouping Liu¹; Kai Kang¹; Xiao Sun¹; ¹College of Mechanical Engineering, University of Chongqing

3:20 PM Break

3:40 PM

The Effect of Welding on Complex Carbide Precipitates in a Ni-Cr-Mo-Si Alloy: *Dhriti Bhattacharyya*¹; Joel Davis¹; Ondrej Muransky¹; Gordon Thorogood¹; Mike Drew¹; Lyndon Edwards¹; ¹ANSTO

4:00 PM

Spatially Correlated Nanoindentation, EBSD, and EDX Characterization of Friction Stir Welds: Oscar Rivera¹; P.G. Allison¹; J.B. Jordon¹; ¹The University of Alabama

4:20 PM

High Resolution Analysis of Ultrasonic-Based Processes and Fatigue Experiments by Laser-Doppler-Vibrometry for Applications in Materials Science and Engineering: *Frank Balle*¹; ¹University of Kaiserslautern

4:40 PM

Selective Laser Melting: Characteristics of IN718 Powder and Microstructures of Fabricated IN718 Sample: *Xiao Sun*¹; Shouping Liu¹; Jun Bao¹; Kai Kang¹; ¹College of Materials Science and Engineering, ChongQing University

Characterization of Nuclear Reactor Materials and Fuels with Neutron and Synchrotron Radiation — Session II

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Jonathan Almer, Argonne National Laboratory; Meimei Li, Argonne National Laboratory; Donald Brown, Los Alamos National Laboratory; Tiangan Lian, Electric Power Research Institute

Monday PM	Room: Grand Harbor Salon 5
March 16, 2015	Location: Yacht & Beach

Session Chair: Meimei Li, Argonne National Laboratory

2:00 PM Introductory Comments

2:05 PM Invited

Utilization of Synchrotron X-ray Techniques for Microstructural Analyses in Irradiated Metallic Nuclear Fuels and Structural Materials: *Maria Okuniewski*¹; David Sprouster²; James Hunter³; Donald Brown³; Lynne Ecker²; Peter Kenesei⁴; Bjorn Clausen³; John Sinsheimer²; ¹Idaho National Laboratory; ²Brookhaven National Laboratory; ³Los Alamos National Laboratory; ⁴Argonne National Laboratory

2:35 PM

Characterization of Grain Growth in Nano-Grained UO₂ with In Situ High Energy X-ray Diffraction and TEM: *Di Yun*¹; Kun Mo¹; Thierry Wiss²; Jonathan Almer¹; Jeffrey Fortner¹; Abdellatif Yacout¹; ¹Argonne National Laboratory; ²European Commision, Institute for Transuranium Elements

2:55 PM

Corrosion at the Surface of a Nuclear Fuel: In-Situ Radiolysis and X-ray Scattering from Thin Single-Crystal UO₂ Films: Ross Springell¹; *Sophie Rennie*¹; Camilla Stitt¹; Elizabeth Cocklin²; Didier Wermeille²; David Morgan³; Robert Burrows⁴; Howard Sims⁴; William Nuttall⁵; Chris Lucas²; Gerard Lander⁶; ¹University of Bristol; ²University of Liverpool; ³University of Cardiff; ⁴National Nuclear Laboratory; ⁵Open University; ⁶ITU

3:15 PM

In Situ Carbothermic Reduction of Uranium Carbide and its High Temperature Cubic Phase: H. Matthias Reiche¹; Sven Vogel¹; ¹Los Alamos National Laboratory

3:35 PM Break

3:50 PM

Isotope Specific Neutron Imaging of Nuclear Fuel Pellets: Adrian Losko¹; Sven Vogel²; Anton Tremsin¹; Darrin Byler²; Ken McClellan²; Mark Bourke²; ¹University of California, Berkeley; ²Los Alamos National Laboratory

4:10 PM Invited

Combined MeV/Nucleon Irradiation and High Energy Synchrotron X-ray Characterization of Nuclear Materials: *Michael Pellin*¹; Abdellatif Yacout¹; Di Yun¹; Kun Mo¹; Walid Mohamed¹; Bei Ye¹; Sumit Bhattacharya²; David Seidman²; ¹Argonne National Laboratory; ²Northwestern University

4:40 PM

Atomistic Modeling and Diffraction Analysis of Metallic Uranium Alloys: *Alex Moore*¹; Chaitanya Deo¹; Michael Baskes²; Maria Okuniewski³; Lynne Ecker⁴; David Sprouster⁴; ¹Georgia Institute of Technology; ²Los Alamos National Laboratory; ³Idaho National Laboratory,; ⁴Brookhaven National Labratory

5:00 PM Invited

Non-Destructive Grain Growth Study in Uranium dioxide Fuel Pellets Using Synchrotron Radiation: *Reeju Pokharel*¹; Donald Brown¹; ¹Los Alamos National Laboratory

Computational Modeling and Stochastic Methods for Materials Discovery and Properties — Materials Discovery and Characterization

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Dallas Trinkle, University of Illinois at Urbana-Champaign; Mikhail Mendelev, Ames Laboratory; Adri van Duin, Pennsylvania State University

Monday PM March 16, 2015 Room: Northern Hemisphere A4 Location: Dolphin

Session Chairs: Mark Asta, University of California, Berkeley; Yuri Mishin, George Mason University

2:00 PM Invited

Computational Database for Elastic Properties of Materials: *Mark Asta*¹; Maarten de Jong¹; Kristin Persson²; Tom Angsten¹; Wei Chen²; ¹University of California, Berkeley; ²Lawrence Berkeley National Laboratory

2:30 PM

Investigations of Early Stages of Nanoindentation through Combined DFT, MD and Hybrid MD/FEM Simulations: *Francesca Tavazza*¹; Li Ma¹; Chandler Becker¹; Lyle Levine¹; ¹National Institute of Standards and Technology

2:50 PM

A Stochastic Approach for Predicting the Mechanical Properties of Graphene: Tomas Mawyin¹; Prasanth Nair¹; *Chandra Veer Singh*¹; ¹University of Toronto

3:10 PM

Computational Discovery of Novel Two-Dimensional Materials with an Evolutionary Algorithm: *Benjamin Revard*¹; Arunima Singh¹; Will Tipton¹; Richard Hennig¹; ¹Cornell University

3:30 PM Break

3:45 PM

An Ab-Initio Investigation of Water Dissociation on Two-Dimensional MoS₂ Edges: Kulbir Ghuman¹; Shwetank Yadav¹; *Chandra Veer Singh*¹; ¹University of Toronto

4:05 PM

Effect of Interwall Interaction, Doping and Defects on the Electronic Structure of DWCNTs: *Matias Soto*¹; ¹Rice University

4:25 PM

Molecular Dynamics Study of the effect of Number of Walls and Temperature on Cohesive Zone Properties of Multi-Walled Carbon Nanotubes/Copper Interface: *Ibrahim Awad*¹; Leila Ladani¹; ¹University of Connecticut

4:45 PM

Conductivity of Metal Alloys Based on First Principles Calculations: Changdong Wei¹; *Nikolas Antolin*¹; J.-C. Zhao¹; Wolfgang Windl¹; ¹Ohio State University

5:05 PM

Atomistic Simulation and Virtual Diffraction Characterization of Stable and Metastable Alumina Surfaces: *Shawn Coleman*¹; Douglas Spearot¹; ¹University of Arkansas

Computational Thermodynamics and Kinetics — Phase Transformations and Kinetic-Ruled Behavior

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Maryam Ghazisaeidi, The Ohio-State University; Vidvuds Ozolins, University of California Los Angeles

Monday PM	Room: Oceanic 3
March 16, 2015	Location: Dolphin

Session Chair: Maryam Ghazisaeidi, Ohio State University

2:00 PM

CFD Simulation of High Temperature Plasma Processing in Graphene Synthesis: *Xiang Ma*¹; Kai Tang¹; ¹SINTEF Materials and Chemistry

2:20 PM

Elements Oxidation during Kinetic Behaviors of Vanadium-Extraction Process in 70t Converter: *Weijun Huang*¹; Yuehao Zhao¹; Min Chen¹; ¹Northeastern University

2:40 PM

Numerical Simulation of Desulfurization Behavior in Gas-Stirred Ladles: Wentao Lou¹; Miaoyong Zhu¹; ¹Northeastern University

3:00 PM

On the Electric Field Developed during Metal Oxidation and the Selfconsistency of Wagner Theory – Insights Learnt from Computer Modeling and Simulations: *Tian-Le Cheng*¹; You-Hai Wen¹; ¹National Energy Technology Laboratory

3:20 PM

Numerical Analysis on the Multi-Physics Field in the ESR System with Vibrating Electrode: *Fang Wang*¹; Yanchun Lou²; Rui Chen²; Zhaowei Song²; Baokuan Li¹; ¹Northeastern University; ²Shenyang Reserch Institute of Foundry

3:40 PM Break

3:55 PM

Modeling of Ferrite-Austenite Phase Transformation: Dong An¹; Shiyan Pan¹; Ting Dai¹; *Bruce Krakauer*²; Mingfang Zhu¹; ¹Southeast University; ²AO Smith Corporate Technology Center

4:15 PM Invited

A General Perspective on the Structural Elements Necessary for Good Ionic Diffusion: *Gerbrand Ceder*¹; ¹Massachusetts Institute of Technology

4:35 PM

A Molecular Dynamics Simulation Study of Solid-State Nucleation during Austenite-Ferrite Phase Transformation in Polycrystalline Fe: *Huajing* Song¹; Jeff. Hoyt¹; ¹Mcmaster University

4:55 PM

Thermodynamic and Kinetic Simulations of DTEM-Based Rapid Solidification in Transition Metal Alloys: *Aurelien Perron*¹; Patrice Turchi¹; Jean-Luc Fattebert¹; Joseph McKeown¹; ¹Lawrence Livermore National Laboratory

Constitutive Response and Modeling of Structural Materials: An SMD Symposium in Honor of G.T. Gray III's 60th Birthday — Microstructure Evolution and Constitutive Response II

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Neil Bourne, University of Manchester; Eric Brown, Los Alamos National Laboratory; James Williams, Ohio State University; Kenneth Vecchio, University of California- San Diego

Monday PM March 16, 2015 Room: Asia 2 Location: Dolphin

Session Chairs: Ellen Cerreta, Los Alamos National Laboratory; Kenneth Vecchio, University of California, San Diego

2:00 PM Invited

Screw Dislocation Cross Slip at Cross-Slip Plane Jogs and Screw Dipole Annihilation in FCC Cu, Ni Investigated via Atomistic Simulations: *Satish Rao*¹; Dennis Dimiduk²; Triplicane Parthasarathy¹; Jaafar El-Awady³; Michael Uchic²; Christopher Woodward²; ¹UES Inc.; ²Air Force Research Laboratory; ³Johns Hopkins University

2:20 PM

A Yield Surface for HCP Materials Undergoing a Wide Range of Loading Conditions: *Jeffrey Lloyd*¹; Richard Becker¹; ¹US Army Research Laboratory

2:40 PM Invited

Numerical Simulation of Deformation Development during Dynamic Tensile Extrusion of OFHC Copper Incorporating Microstructure Evolution: *Nicola Bonora*¹; Andrew Ruggiero¹; Simone Dichiaro¹; Gabriel Testa¹; Magnus Hörnqvist²; Nooshin Mortazavi Seyedeh²; Mats Halvarsson²; ¹University of Cassino; ²Chalmers University of Technology

3:00 PM Invited

Constitutive Behavior of Materials: Experiments, Modeling and Validation: *Shuh Rong Chen*¹; G.T. Gray¹; ¹Los Alamos National Laboratory

3:20 PM

The Influence of Microstructural Anisotropy and Strain Rate on the Shear Response OF 6061 AND 7039 Aluminum Alloys: *Kenneth Vecchio*¹; G.T. Gray²; Veronica Livescu²; ¹University of California San Diego; ²Los Alamos National Laboratory

3:40 PM Break

4:00 PM Invited

Effects of Microstructural Anisotropy on the Mechanical Properties of Aluminum Alloy AA 7010 – T7651: Alison Cranston¹; *Juan P. Escobedo-Diaz*¹; Paul Hazell¹; Gareth Appleby-Thomas²; Md Zakaria Quadir¹; ¹UNSW Australia; ²Cranfield University

4:20 PM Invited

Kinetics of Shock-Induced Solid-Solid Phase Transformations: Dean Preston¹; Abigail Hunter¹; ¹Los Alamos National Laboratory

4:40 PM

Warm Forming Of ZEK100 Magnesium Sheet in Tensile Stress States: *Cliff Butcher*¹; Srihari Kurukuri¹; Nima Panahi¹; Michael Worswick¹; Tim Skszek²; ¹University of Waterloo; ²Cosma Promatek Research Center

5:00 PM Invited

Thermal Residual Stresses in Polycrystalline a-Uranium: Christopher Calhoun¹; Elena Garlea²; Don Brown³; *Sean Agnew*¹; ¹University of Virginia; ²Y-12 Security Complex; ³Los Alamos National Laboratory

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5:20 PM

FFT Modeling of Deformation Behavior in Metallic Glass Matrix Composites: Michael Gibbons¹; David Riegner¹; Kelly Kranjc²; Nicholas Hutchinson¹; Allen Hunter³; Douglas Hofmann⁴; Jennifer Carter⁵; Emmanuelle Marquis³; Katherine Flores²; Stephen Niezgoda¹; Wolfgang Windl¹; ¹The Ohio State University; ²Washington University in St. Louis; ³University of Michigan; ⁴Jet Propulsion Laboratory; ⁵Case Western Reserve University

5:40 PM

A Multi-Scale Model of Dislocation Plasticity in á-Fe: Incorporating Temperature, Strain Rate and Non-Schmid Effects: *Hojun Lim*¹; Lucas Hale¹; Jonathan Zimmerman¹; Corbett Battaile¹; Christopher Weinberger²; ¹Sandia National Laboratories; ²Drexel University

6:00 PM

The Origin of Oxygen Strengthening Effect in a-Titanium: *Liang Qi*¹; Qian Yu¹; Tomohito Tsuru²; Andrew Minor¹; John Morris¹; Mark Asta¹; Daryl Chrzan¹; ¹University of California,Berkeley; ²Japan Atomic Energy Agency

Development of "Weak Links" during the Processing of Metallic Materials — Microstructure Characterization

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Lee Semiatin, US Air Force Research Laboratory; Anthony Rollett, Carnegie Mellon University; Thomas Bieler, Michigan State University; Mark Stoudt, National Institute of Standards and Technology

Monday PM	Room: Peacock
March 16, 2015	Location: Swan

Session Chairs: Thomas Bieler, Michigan State University; Ayman Salem, Materials Resources LLC

2:00 PM Keynote

Quantifying Microstructural Defects in Materials: Theory and Experiment: *Louis Hector Jr*¹; ¹General Motors

2:30 PM Invited

Accounting for Abnormal Features in Representative Descriptions of Microstructure: Ayman Salem¹; Daniel Satko¹; Joshua Shaffer¹; Surya Kalidindi²; Lee Semiatin³; ¹Materials Resources LLC; ²Georgia Institute of Technology; ³Air Force Research Laboratory

3:00 PM Invited

Finding the Weakest Link within the Hierarchy of Microstructure in Titanium Alloys: Adam Pilchak¹; ¹Air Force Research Laboratory

3:30 PM Break

3:45 PM Invited

Evolution of Excess Dislocation Density at Grain Boundaries during Deformation of Polycrystalline Metals: *David Field*¹; ¹Washington State University

4:15 PM

EBSD versus HEDM Characterization of Orientation Gradients during Plastic Deformation: Anthony Rollett¹; Samikshya Subedi¹; *Reeju Pokharel*²; Robert Suter¹; ¹Carnegie Mellon University; ²Los Alamos National Laboratory

4:45 PM

Analysis of the Subsurface Slip Activity during Plastic Deformation Using Crystal Plasticity Finite Element Method with Realistic 3D Microstructure: *Chen Zhang*¹; Philip Eisenlohr¹; Thomas Bieler¹; Martin Crimp¹; Carl Boehlert¹; ¹Michigan State University

5:05 PM

Material Characteristics and Defects Found in Metal Injection Molded (MIM) Materials via Metallographic Cross-Sectioning: Julius Bonini¹; Joan Morra¹; ¹Lucideon M + P

Dynamic Probing of Microstructure Evolution in Nanostructured Materials — Impurity and Twinning Effects

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee *Program Organizers:* Nan Li, Los Alamos National Laboratory; Caizhi Zhou, Missouri University of Science and Technology; Dan Gianola, University of Pennsylvania; Marc Legros, CEMES-CNRS

Monday PM March 16, 2015

Room: Mockingbird 2 Location: Swan

Session Chairs: Daniel Gianola, University of Pennsylvania; Kaiyuan Yu, Texas A&M University

2:00 PM Invited

In Situ Studies of Solid Solution Strengthening: Daniel Caillard¹; ¹CNRS

2:30 PM

Impurity Effects on Grain Growth and Mechanical Behavior in Nanocrystalline Thin Films: *Suman Dasgupta*¹; Mo Rigen He²; Daniel Gianola²; Kevin Hemker¹; ¹Johns Hopkins University; ²University of Pennsylvania

2:50 PM

In-Situ Study of Oxygen's Contribution to Mechanical Strengthening in Titanium: *Rachel Traylor*¹; Christoph Gammer²; Qian Yu²; David Olmsted¹; Mark Asta¹; Andrew Minor²; ¹University of California Berkeley; ²National Center for Electron Microscopy

3:10 PM

In Situ Electrochemical-Microcompression Test: An Investigation of Dislocation-Grain Boundary Interaction in Presence of Hydrogen: *Nousha Kheradmand*¹; Roy Johnsen¹; Afrooz Barnoush¹; ¹Norwegian University of Science and Technology

3:30 PM Break

3:50 PM Invited

Mechanical Behavior of Nanotwinned Metals: *Xinghang Zhang*¹; Daniel Bufford¹; Yue Liu¹; Haiyan Wang¹; ¹Texas A&M University

4:20 PM

In-Situ High Resolution TEM on Deformation Process in Angstrom Scaled Twins: *Scott Mao*¹; Jiangwei Wang¹; Frederic Sansoz²; Ze Zhang³; ¹University of Pittsburgh; ²The University of Vermont; ³Zhejiang University

4:40 PM

The Effects of Solutes on the Microstructures and Mechanical Properties of Nano-Twinned Ag Thin Films: *Jie Geng*¹; Matthew Besser¹; Matthew Kramer¹; Huan Zhang¹; Ryan Ott¹; ¹Ames Laboratory

5:00 PM

Rebound of High-Speed Dislocations to Initiate Deformation Twinning in Nanostructured Metals: *Qingjie Li*¹; Evan Ma¹; ¹Johns Hopkins University

5:20 PM

Basic Criteria for Formation of Growth Twins in High Stacking Fault Energy Metals: *Kaiyuan Yu*¹; Daniel Bufford²; Youxing Chen³; Yue Liu³; Haiyan Wang³; Xinghang Zhang³; ¹China University of Petroleum-Beijing; ²Sandia National Laboratories; ³Texas A&M University

MONDAY PM

Electrode Technology for Aluminum Production — Anode Raw Materials

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Arne Ratvik, SINTEF

Monday PM March 16, 2015 Room: Southern Hemisphere II Location: Dolphin

Session Chair: Alan Tomsett, Pacific Aluminium

2:00 PM Introductory Comments

2:05 PM

Pilot Anode Testing of Alternative Binder and CPC Raw Materials: Winfried Boenigk¹; Claudia Boltersdorf¹; *Christopher Kuhnt*¹; Jens Stiegert¹; Les Edwards²; Marvin Lubin²; ¹RÜTGERS Basic Aromatics GmbH; ²Rain CII Carbon LLC

2:30 PM

Calcined Petroleum Coke Density Separation Process: Solution to Maintain Anode Quality with Degrading Coke Density: Marie-Josée Dion¹; Yvon Ménard¹; ¹Rio Tinto Alcan

2:55 PM

New Developments of Anode Coke Grinding Using a Vertical Mill Technology: *Hans-Dieter Nolde*¹; Jan Paepcke¹; Jens-Peter Thiel¹; Arne Hilck¹; ¹Claudius Peters Projects

3:20 PM

Effects of Mixing Parameters and Pores of Cokes on Pitch Absorption in Making Carbon Anode Pastes: *Tong Chen*¹; Jilai Xue¹; Xiang Li²; Guanghui Lang²; Guojing Zhou²; Lin Tang²; ¹University of Science and Technology Beijing; ²Sunstone Carbon

3:45 PM Break

4:00 PM

Real-Time Measurement of Coke Aggregate Size and Vibrated Bulk Density Using Image Texture Analysis: Wilinthon Bogoya Forero¹; Carl Duchesne¹; Jayson Tessier²; ¹Laval University; ²Alcoa Global Primary Metals

4:25 PM

Anode Aggregate Bulk Density Determinations Using a Y-Blender: David Belitskus¹; ¹DLB Consulting

4:50 PM

A Size-Dependent Thermodynamic Model for the Carbon/Hydrogen/ Sulfur System in Coke Crystallites: Application to the Production of Pre-Baked Carbon Anodes: *Philippe Ouzilleau*¹; Aimen Gheribi¹; Patrice Chartrand¹; ¹CRCT-Ecole Polytechnique de Montreal

5:15 PM

Traceability of Raw Materials in Silos in an Anode Plant: *Dipankar Bhattacharyay*¹; Duygu Kocaefe¹; Yasar Kocaefe¹; Brigitte Morais²; Jacques Lafrance²; ¹University of Quebec at Chicoutimi; ²Aluminerie Alouette Inc.

Fatigue in Materials: Fundamentals, Multiscale Modeling, Life Prediction and Prevention — Modeling Fatigue Behaviors and Life Prediction

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee Program Organizers: Tongguang Zhai, University of Kentucky;

Antonios Kontsos, Drexel University

Monday PM March 16, 2015 Room: Australia 3 Location: Dolphin

Session Chairs: Tongguang Zhai, University of Kentucky; Jacob Hochhalter, NASA LaRC

2:00 PM Keynote

Perspectives on Top-Down and Bottom-Up Microstructure-Sensitive Fatigue Modeling: David McDowell¹; ¹Georgia Institute of Technology

2:35 PM Invited

Statistically Modeling High Cycle Fatigue without Failure Data: *D. Gary Harlow*¹; ¹Lehigh University

2:55 PM Invited

A Probabilistic Life Prediction Method of Multiple Fatigue Failure Modes: Liyang Xie¹; ¹Northeastern University, Shenyang, China

3:15 PM

Life Prediction of Thermomechanical Fatigue via Strain Energy Density: *Thomas Bouchenot*¹; Ali Gordon¹; Ravi Penmetsa²; ¹University of Central Florida; ²Air Force Research Laboratory

3:35 PM Break

3:50 PM

Multiaxial Fatigue Life Prediction of Titanium Alloy Electronic-Beam Welded Joints under Proportional and Non-Proportional Combined Loading: Xiaogang Liu¹; ¹Nanjing University of Aeronautics and Astronautics

4:10 PM Invited

Defect Modeling and Endurance Limit Prediction for Cast Aluminum Alloys: Ryan Cooper¹; Shibayan Roy¹; Adrian Sabau¹; Charles Hawkins¹; *Amit Shyam*¹; ¹Oak Ridge National Laboratory

4:30 PM

Microstructure-Sensitive MultiStage Fatigue (MSF) Modeling of the Cyclic Behavior of a Rolled Homogeneous Armor (RHA) Class Steel Weld Joint: *Justin Hughes*¹; Marcos Lugo¹; Mark Horstemeyer¹; Hongjoo Rhee¹; ¹Center for Advanced Vehicular Systems

4:50 PM

Crystal Viscoplasticity of a Ni-Base Superalloy in the Aged State: *Michael Kirka*¹; Richard Neu¹; ¹Georgia Institute of Technology

5:10 PM

Life Prediction of Ti-6242S and IN617 under Thermo-Acousto-Mechanical Fatigue: *Ali Gordon*¹; Ravi Penmetsa²; ¹University of Central Florida; ²Air Force Research Laboratory



Friction Stir Welding and Processing VIII — High Temperature Materials II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Rajiv Mishra, University of North Texas; Murray Mahoney, retired from Rockwell Scientific; Yutaka Sato, Tohoku University; Yuri Hovanski, Pacific Northwest National Laboratory

Monday PM	Room: Northern Hemisphere A3
March 16, 2015	Location: Dolphin

Session Chairs: Glenn Grant, Pacific Northwest National Laboratory; Russell Steel, MegaStir

2:00 PM Invited

Performance Enhancement of Co-Based Alloy Tool for Friction Stir Welding of Ferritic Steel: Yutaka Sato¹; Masahiro Miyake¹; Shinichi Susukida¹; Hiroyuki Kokawa¹; Toshihiro Omori¹; Kiyohito Ishida¹; Shiya Imano²; Seung Hwan Park²; Itto Sugimoto²; Satoshi Hirano²; ¹Tohoku University; ²Hitachi, Ltd.

2:20 PM Invited

Process, Microstructure and Fracture Toughness in FSW HSLA Steels: Tracy Nelson¹; Allan Tribe²; ¹Brigham Young University; ²NOV Intelliserv

2:40 PM Invited

Stabilization of the Retained Austenite in Steel by Friction Stir Welding: *Takuya Miura*¹; Rintaro Ueji¹; Hidetoshi Fujii¹; ¹Joining and Welding Research Institute, Osaka University

3:00 PM

Study of Mechanical Properties and Characterization of Pipe Steel Welded by Hybrid (Friction Stir Weld + Root Arc) Approach: *Yong Chae Lim*¹; Samuel Sanderson²; Murray Mahoney³; Andrew Wasson⁴; Doug FairChild⁴; Yanli Wang¹; Zhili Feng¹; ¹Oak Ridge National Laboratory; ²MegaStir Techologies LLC; ³Consultant; ⁴ExxonMobil Upstream Research Company

3:20 PM

Friction Stir Welding of Nanolamellar Metallic Composites: *Josef Cobb*¹; Shraddha Vachhani²; Nathan Mara²; Cheng Liu²; Manny Lovato²; Judy Schneider¹; John Carpenter²; ¹Mississippi State University; ²Los Alamos National Laboratory

3:40 PM Break

4:00 PM Invited

Improved Temperature and Depth Control during FSW of Copper Canisters Using Feedforward Compensation: Lars Cederqvist¹; Olof Garpinger²; Anton Cervin²; Isak Nielsen³; ¹SKB; ²Lund University; ³Linkoping University

4:20 PM Invited

Friction Stir Welding of Steels Using a Tool Made of Iridium-Containing Nickel Base Superalloy: *Tatsuya Nakazawa*¹; Yutaka Sato²; Hiroyuki Kokawa²; Toshihiro Omori²; Kiyohito Ishida²; Kunihiro Tanaka¹; Koichi Sakairi¹; ¹Tanaka Kikinzoku Kogyo K.K.; ²Tohoku University

4:40 PM

Heat Input and Post Weld Heat Treatment Effects on Reduced-Activation Ferritic/Martensitic Steel Friction Stir Welds: *Wei Tang*¹; Jian Chen¹; Xinghua Yu¹; David Frederick¹; Zhili Feng¹; ¹Oak Ridge National Lab

Fundamental Methods for Integrating Microstructure-Property-Design Relationships into the ICME Paradigm — Measurement and Modeling of Multi-Scale Deformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee *Program Organizers:* Christopher Woodward, Air Force Research Laboratory; Somnath Ghosh, Johns Hopkins University

Monday PM	Room: Oceanic 2
March 16, 2015	Location: Dolphin

Session Chairs: Jessica Krogstad, University of Illinois; Satish Rao, Ecole Polytechnique Federale de Lausanne

2:00 PM Invited

Benchmarking Multi-Scale Models with Micro-Mechanical Experiments: David Eastman¹; Zafir Alam¹; *Jessica Krogstad*²; Kevin Hemker¹; William Lenthe³; Tresa Pollock³; Paul Shade⁴; David Mollenhauer⁴; Michael Uchic⁴; ¹Johns Hopkins University; ²University of Illinois, Urbana-Champaign; ³University of California, Santa Barbara; ⁴Air Force Research Laboratory

2:30 PM

Micro-bending Fatigue Testing of Ni and Ni-base Superalloys: Experiments in Support of ICME: Zafir Alam¹; Jessica Krogstad¹; David Eastman¹; Thomas Straub¹; Christoph Eberl²; Kevin Hemker¹; ¹Johns Hopkins University; ²Fraunhofer Institute for Mechanics of Materials

2:50 PM Invited

Comparison of Geometrically Necessary Dislocation Density Distribution in Indented FCC and BCC Crystals: *Jeffrey Kysar*¹; Muin Oztop¹; Carl Dahlberg¹; Christian Niordson²; ¹Columbia University; ²Technical University of Denmark

3:20 PM

Microstructural Modeling of Dynamic Intergranular and Transgranular Fracture Modes in Crystalline Alloys: S. Ziaei¹; Mohammed Zikry¹; ¹North Carolina State University

3:40 PM Break

4:00 PM Invited

Unified Framework for Coarse-Grained Modeling of Plastic Deformation in Metals and Polymers: *Jaafar El-Awady*¹; ¹Johns Hopkins University

4:30 PM

Dislocation Dynamics Simulations of Precipitate Strengthening in an Mg-Al-Zn Alloy: *Larry Aagesen*¹; Jiashi Miao¹; Sylvie Aubry²; Athanasios Arsenlis²; John Allison¹; ¹University of Michigan; ²Lawrence Livermore National Laboratory

4:50 PM

Simulations of Orientation Dependence of Strain-Hardening Characteristics and Dislocation Microstructure Evolution in 20micron Size Ni Microcrystals: Satish Rao¹; Dennis Dimiduk²; Michael Uchic²; Ahmed Hussein³; Triplicane Parthasarathy¹; Jaafar El-Awady³; Christopher Woodward²; William Curtin⁴; ¹UES Inc.; ²Air Force Research Laboratory; ³Johns Hopkins University; ⁴EPFL

High-Performance Aerospace Alloys Design Using ICME Approach — Session II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee *Program Organizers:* Awadh Pandey, Pratt & Whitney; Somnath Ghosh, Johns Hopkins University; Dongsheng Li, Pratt & Whitney

Monday PM	Room: Oceanic 6
March 16, 2015	Location: Dolphin

Session Chair: Dongsheng Li, Pratt & Whitney

2:00 PM Invited

Structural Materials Data Demonstration Project: Outcomes and Lessons Learned: Larry Berardinis¹; *Scott Henry*¹; Carelyn Campbell²; Alden Dima²; Ursula Kattner²; Tom Searles³; Laura Bartolo⁴; Warren Hunt⁵; ¹ASM International, CMD Network; ²NIST; ³Materials Data Management Inc.; ⁴Kent State University Center for Materials Informatics; ⁵Nexight Group

2:30 PM

Stochastic Simulation Methods for Conversion among Multiple Modalities of Grain Size Distributions: *Dayu Huang*¹; Jin Xia¹; Xiaolei Shi¹; J. Brandon Laflen¹; Andrew Deal¹; Timothy Hanlon¹; Ian Spinelli¹; James Laflen¹; ¹General Electric

2:50 PM

Large Scale Discrete Dislocation Dynamics Simulations of Plastic Deformation of Nickel Superalloys: *Ahmed Hussein*¹; Satish Rao²; Dennis Dimiduk³; Michael Uchic³; Jaafar Elawady¹; ¹Johns Hopkins University; ²UES Inc.; ³Air Force Research Lab

3:10 PM

Integrating Computational Tools and Physical Models to Predict Process-Structure-Properties of Precipitation-Hardened Aluminum Alloys: *Ashley Goulding*¹; Richard Neu¹; ¹Georgia Institute of Technology

3:30 PM Break

3:50 PM Invited

Effects of Thermal Transient Rates on Turbine Durability Lifing: *Alexander Staroselsky*¹; Thomas Martin¹; ¹UTRC

4:20 PM

Stacking Faults in γ" Phase and Characteristics of Its Shear Deformation: Duchao Lv¹; Donald McAllister¹; Michael Mills¹; Yunzhi Wang¹; ¹OSU MSE

4:40 PM

Probabilistic Simulation of Minimum Life Mechanisms for Component Life Prediction: *Patrick Golden*¹; Sushant Jha²; Reji John¹; ¹Air Force Research Laboratory; ²Universal Technology Corporation

5:00 PM

Simulation of Microstructure Evolution in Aerospace Alloys – Some Examples: Markus Apel¹; Bernd Böttger¹; Janin Eiken¹; Ulrike Hecht¹; *Georg Schmitz*¹; ¹Access e.V.

High-Temperature Electrochemistry II — Nuclear and Rare Earth Technology

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee Program Organizers: Prabhat Tripathy, Idaho National Laboratory; Guy Fredrickson, Idaho National Lab

Monday PM March 16, 2015 Room: Grand Harbor Salon 2 Location: Yacht & Beach

Session Chairs: Uday Pal, Boston University; Ramachandran Kumar, University of Cambridge

2:00 PM

Application of a 1D Transient Electrorefiner Model to Predict Partitioning of Plutonium from Curium in a Pyrochemical Spent Fuel Treatment Process: Mario Gonzalez¹; Lauryn Hansen¹; Devin Rappleye¹; Riley Cumberland¹; *Michael Simpson*¹; ¹University of Utah

2:40 PM

Study of Oxygen Ion Diffusion during the Electrolytic Reduction of Uranium Oxide in Molten LiCl-Li2O: *Steven Herrmann*¹; Clint Baker¹; Robert Hoover¹; Jin-Mok Hur²; ¹Idaho National Laboratory; ²Korea Atomic Energy Research Institute

3:20 PM Break

3:40 PM

Characterization of Samarium Chloride-Europium Chloride in Molten LiCl-KCl Eutectic by Electrochemical Impedance Spectroscopy: Kerry Allahar¹; *Michael Shaltry*²; Darryl Butt¹; Michael Simpson³; Ken Bateman²; ¹Boise State University; ²Idaho National Laboratory; ³University of Utah

Hume-Rothery Award Symposium: Multicomponent Alloy Metallurgy, the Bridge from Materials Science to Materials Engineering — Solidification

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee Program Organizers: Ursula Kattner, National Institute of Standards and Technology; Mark Asta, University of California at Berkeley; Raymundo Arroyave, Texas A&M University

Monday PM March 16, 2015 Room: Oceanic 1 Location: Dolphin

Session Chairs: Ursula Kattner, NIST; John Perepezko, University of Wisconsin-Madison

2:00 PM Invited

A Tentative Thermodynamic View of Quasicrystal-Enhanced Nucleation during the Solidification of fcc Metallic Alloys: *Michel Rappaz*¹; Güven Kurtuldu¹; ¹EPFL

2:30 PM Invited

Coupled Growth Structures in Ternary Alloys: *Ralph Napolitano*¹; Amber Genau²; ¹Iowa State University; ²University of Alabama at Birmingham

3:00 PM Invited

Prediction of A-Segregates and Freckles Due To Multicomponent Thermosolutal Convection during Solidification: Christoph Beckermann¹; ¹University of Iowa

3:30 PM Break

4:00 PM Invited

Studies on the Solidification Path of Single Crystal Superalloys: Nils Warnken¹; ¹University of Birmingham

www.tms.org/TMS2015

4:30 PM Invited

A Molecular Dynamics Simulation Study of the Crystal-Melt Interfacial Free Energy and its Anisotropy in the CuAgAu Ternary System: Jeffrey Hoyt1; 1McMaster University

5:00 PM Invited

MONDAY PM

Damage-Tolerant Multi-Component Metallic Glasses with Record-Breaking Facture Toughness: Evan Ma1; 1Johns Hopkins University

Integrative Materials Design II: Performance and Sustainability — Advanced Manufacturing Technologies: Processing, Structure, Properties, and Desian

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Materials and Society Committee

Program Organizers: Diana A. Lados. Worcester Polytechnic Institute: Brad Boyce, Sandia National Labs; Michael Sangid, Purdue University; Weizhou Li, Caterpillar Inc

Monday PM March 16, 2015 Room: Grand Harbor Salon 8 Location: Yacht & Beach

Session Chairs: Diana Lados, Worcester Polytechnic Institute; Wenjun Cai, University of South Florida

2:00 PM Invited

Production of HIP PM Near Nets Shapes: Challenges and Opportunities: Stephen Mashl1; 1Michigan Technological University

2:25 PM

Experimental Characterization for Through-Process Modeling of Cold Spray Al Alloys: Baillie McNally¹; Danielle Belsito¹; Victor Champagne²; Richard Sisson¹; ¹Worcester Polytechnic Institute; ²U.S. Army Research Lab

2:45 PM

Design of Cold-Spray 6061 Aluminum Alloys for Fatigue Crack Growth Resistance in Structural Components, Coatings, and Repairs: Anastasios Gavras¹; *Diana A. Lados*¹; Victor Champagne²; ¹Worcester Polytechnic Institute; ²US Army Research Laboratory

3:05 PM

Friction Stir Processing and Welding of Wrought and Cast Aluminum Alloys: Thermal Modeling, Process Optimization, and Fabrication of Nano-Composites: Yi Pan1; Diana Lados1; 1Worcester Polytechnic Institution

3:25 PM

Friction Stir Welding of Dissimilar Materials for Structural Applications: Laura Murray¹; Diana Lados¹; ¹Worcester Polytechnic Institute

3:45 PM Break

4:05 PM Invited

Engineered, Hierarchical Nanocomposites. Structures by Design: Andrew Sherman1; Nick Farkas2; Mark Grogan1; 1Powdermet Inc; 2Terves Inc

4:30 PM Invited

Corrosion Resistance of Al-Mn Alloy with Nanocrystalline and Amorphous Structure: Hesham Mraied¹; Alberto Sagüés¹; Wenjun Cai¹; ¹University of South Florida

4:55 PM

Sn Additions to NiTi for Novel Shape Memory Alloy Design: Oscar Figueroa1; John Newman2; Michele Manuel1; 1University of Florida; 2NASA Langley Research Center

5:15 PM Invited

Materials Selection for Medical Devices in a Changing Healthcare Environment: Markus Reiterer¹; Mark Breyen¹; ¹Medtronic, Inc.

Magnesium Technology 2015 — Elevated Temperature and Creep

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: Michele Manuel, University of Florida; Martyn Alderman, Magnesium Elektron; Alok Singh, National Institute for Materials Science; Neale Neelameggham, Ind LLC

Monday PM	Room: Northern Hemisphere E1
March 16, 2015	Location: Dolphin

Session Chairs: Amit Pandey, LG Fuel Cell Systems; Karl Kainer, Helmholtz-Zentrum Geesthacht

2:00 PM Invited

Three Decades of Electron Backscatter Diffraction of Magnesium: What Has It Taught Us?: Matthew Barnett¹; ¹Deakin University

2:20 PM Invited

Measuring and Modeling the Effects of Mechanical Twinning on the Behavior of Mg Alloys: Sean Agnew¹; Peidong Wu²; Kaan Inal³; Haitham El Kadiri4; Jian Wang5; Carlos Tome5; 1University of Virginia; 2McMaster University; 3University of Waterloo; 4Mississippi State University; 5Los Alamos National Laboratory

2:40 PM Demonstration Poster Presentation Pitches

3:40 PM Break

4:00 PM

Microstructure and Properties of Aged Vs Crept Mg-Al-Zn-Sn Alloys with Additions of Nd and Ce: Uri Vainberg¹; Shaul Avraham²; Alexander Katsman¹; *Menahem Bamberger*¹; ¹Technion - Israel Institute of Technology; ²NRCN - Nuclear Research Center Negev

4:20 PM

Hot Compression Behavior of Magnesium Alloys ZE20 and AM30: Scott Sutton¹; Alan Luo¹; ¹The Ohio State University

4:40 PM

Creep Response of a Zn Containing Mg-Nd-La Alloy: Deep Choudhuri¹; David Jaeger1; Srinivasan Srivilliputhur1; Mark Gibson2; Rajarshi Banerjee1; ¹University of North Texas; ²CSIRO

5:00 PM

Creep Deformation Mechanisms and Related Microstructure Development of AZ31 Magnesium Alloy: Peiman Shahbeigi Roodposhti1; Apu Sarkar1; Korukonda Murty¹; ¹North Carolina State University

Magnesium Technology 2015 — Primary, Sustainability, Recycling, and Processing

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: Michele Manuel, University of Florida; Martyn Alderman, Magnesium Elektron; Alok Singh, National Institute for Materials Science; Neale Neelameggham, Ind LLC

Monday PM	Room: Northern Hemisphere E2
March 16, 2015	Location: Dolphin

Session Chairs: Neale Neelameggham, IND LLC; James Saal, QuestTek Innovations, LLC

2:00 PM

Thermal Electrolytic Production of Mg from MgO: Reflections on Commercial Viability: Robert Palumbo1; Scott Duncan1; Luke Venstrom1; Carol Larson¹; Shahin Nudehi¹; Michal Korenko¹; Jon Schoer¹; Richard Diver²; Stuart Barklev¹; William Prusinski¹; Brittany Robbinson¹; Jason Toberman¹; Kent Warren¹; Dave Johnson¹; F. Simko³; M. Boca⁴; ¹Valparaiso University; ²Diver Solar LLC; ³Instittue of Inorganic Chemistry, ; ⁴Instittue of Inorganic Chemistry.

2:20 PM

Study on Compressive Strength of Pellets for Novel Silicothermic Process: Fu Daxue¹; Guan Lukui¹; Wen Ming¹; Dou Zhihe¹; Zhang Rui¹; *Zhang Ting 'an*¹; ¹Northeastern University

2:40 PM

Carbothermal Production of Magnesium in Vacuum: *Tao Qu*¹; Bin Yang¹; Yang Tian¹; Yongnian Dai¹; ¹Kunming University of Science and Technology

3:00 PM

Effect of Argon Flow Rate on the Condensation of Magnesium Vapor from Carbothermic Reduction of Magnesia: Guangyong Bin¹; *Yu Wang*¹; Siya Wang¹; Xiaoping Liang¹; ¹College of Materials Science and Engineering, Chongqing University

3:20 PM

Environmental Impact of MgO Carbothermic Reduction in Vacuum: Hong-xiang Liu¹; *Yang Tian*¹; Bin Yang¹; Bao-qiang Xu¹; Da-chun Liu¹; Yongnian Dai¹; ¹Kunming University of Science and Technology

3:40 PM Break

4:00 PM

Comparative Environmental Benefits of Lightweight Design in the Automotive Sector: The Case Study of Recycled Magnesium against CFRP and Steel: Fabrizio D'Errico¹; Luigi Ranza²; ¹Politecnico di Milano; ²CiaoTech-PNO Cosultants Group

4:20 PM

In Situ Synchrotron Radiation Diffraction during Solidification of Mg15Gd: Effect of Cooling Rate: *Gabor Szakacs*¹; Chamini Mendis¹; Domonkos Tolnai¹; Andreas Stark¹; Norbert Schell¹; Karl Kainer¹; Norbert Hort¹; Martin Wolff¹; Henry Ovri¹; Rainer Schmid-Fetzer²; Joachim Gröbner²; ¹Helmholtz-Zentrum Geesthacht; ²Technische Universitat Clausthal

4:40 PM

Microstructures and Tensile Properties of Mg-4Al-4La-0.4Mn-xB (x = 0,0.01, 0.02, 0.03) Alloy: *Jian Meng*¹; Qiang Yang¹; Zheng Tian¹; Xin Qiu¹; ¹Changchun Institute of Applied Chemistry, Chinese Academy of Sciences

5:00 PM

The Role of Bismuth in Grain Refinement of Magnesium and Its Alloys: *Utsavi Joshi*¹; Hari Babu Nadendla¹; ¹Brunel University

Magnetic Materials for Energy Applications V — Permanent Magnets I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Magnetic Materials Committee

Program Organizers: Francis Johnson, GE Global Research; Raju Ramanujan, Nanyang Technological University; Paul Ohodnicki, National Energy Technology Laboratory

Monday PM	Room: Grand Harbor Salon 7
March 16, 2015	Location: Yacht & Beach

Session Chairs: Raju Ramanujan, Nanyang Technological University; Ivan Skorvanek, Institute of Experimental Physics

2:00 PM Invited

Fe16N2: A 40-Year Mystery Material and Its Promise for Next Generation Rare Earth-Free Magnet: *Jian-Ping Wang*¹; Xiaowei Zhang¹; Yanfeng Jiang¹; Md Mehedi¹; ¹University of Minnesota

2:30 PM Invited

Fabrication of MnBi magnet using warm extrusion method: *Jun Cui*¹; Michael Dahl¹; Wei Xie¹; Jungpyung Choi¹; Evgueni Plikarpov¹; Mark Bowden¹; ¹Pacific Northwest National Laboratory

3:00 PM Invited

Mn-Based Permanent Magnets with the L1⁰ **Structure**: Florian Bittner¹; Torsten Mix¹; Ludwig Schultz¹; *Thomas G. Woodcock*¹; ¹IFW Dresden

3:30 PM Break

3:45 PM Invited

Multi-scale Microstructure Characterization of Nd-Fe-B Sintered Magnet: *Taisuke Sasaki*¹; Tadakatsu Ohkubo¹; Yasuhiro Une²; Masato Sagawa²; Kazuhiro Hono¹; ¹National Institute for Materials Science; ²Intermetallics Co., Ltd.

4:15 PM

Anisotropic Rare Earth-Lean Pr-Fe-B Nanocomposite Magnets: Rajasekhar Madugundo¹; Weiqiang Liu¹; *George Hadjipanayis*¹; ¹Department of Physics and Astronomy, University of Delaware

4:45 PM Invited

Nanoscale Structuring of High-Energy Magnetic Materials: David Sellmyer¹; Wenyong Zhang¹; Balamurugan Balasubramanian¹; Bhaskar Das¹; Ralph Skomski¹; ¹University of Nebraska

5:15 PM

Processing of Bulk, Heat-Treat-Free, Nano-Structured Hf₂Co₁₁B-based Permanent Magnet Material: *Orlando Rios*¹; Michael McGuire¹; ¹Oak Ridge National Laboratory

5:35 PM

Hard Magnetic Phase Evolution in Nanocrystalline Mechanically Milled Amorphous PrCoB Powder and Prospects for Additive Manufacturing Bonded Magnets.: *Huseyin Ucar*¹; Orlando Rios¹; M. Parans Paranthaman¹; Belther Monono¹; Michael McGuire¹; Brian Post¹; Vlasta Kunc¹; Cajetan Nlebedim²; R. McCallum²; Scott McCall³; ¹Oak Ridge National Laboratory; ²Ames Laboratory; ³Lawrence Livermore National Laboratory

Materials and Fuels for the Current and Advanced Nuclear Reactors IV — Fuels II

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory

Monday PM March 16, 2015 Room: Grand Harbor Salon 6 Location: Yacht & Beach

Session Chair: Douglas Burkes, Pacific Northwest National Laboratory

2:00 PM

Out-of-Pile Test of the Effectiveness of Chemical Immobilization of Lanthanide in U-Zr Alloy Fuel: *Yeon Soo Kim*¹; Tom Wiencek¹; Ed O'Hare¹; Jeff Fortner¹; ¹Argonne National Laboratory

2:20 PM

Engineering Challenges in the Down Selection of the TREAT Pre-Conceptual Low-Enriched Fuel System Concepts and Design: *Isabella van Rooyen*¹; Kirt Jamison¹; Erik Luther²; Dionissios (Dennis) Papadias³; Sean Morrell¹; Arthur Wright³; Howard (Buddy) Hartman¹; ¹Idaho National Laboratory; ²Los Alamos National Laboratory; ³Argonne National Laboratory

2:40 PM

Pre-conceptual Development and Characterization of an Extruded Graphite Composite Fuel for the TREAT Reactor: *Erik Luther*¹; Isabella van Rooyen²; Ching-Fong Chen¹; David Dombrowski¹; Rafael Leckie¹; Pallas Papin¹; Andrew Nelson¹; ¹Los Alamos National Laboratory; ²Idaho National Laboratory

3:00 PM

Fuel-Cladding Chemical Interaction Effects in U, Pu-Based Fuels and Cladding: *Assel Aitkaliyeva*¹; Brandon Miller¹; James Madden¹; Cynthia Papesch¹; ¹Idaho National Laboratory

3:20 PM

Effect of Burn-Up on the Thermal Conductivity of Uranium-Gadolinium Dioxide Up to 100 GWd/tHM: *Dragos Staicu*¹; V. V. Rondinella¹; C. T. Walker¹; D. Papaioannou¹; R.J.M. Konings¹; C. Ronchi¹; M. Sheindlin¹; A. Sasahara²; T. Sonoda²; M. Kinoshita²; ¹European Commission, Joint Research Centre, Institute for Transuranium Elements; ²Central Research Institute of Electric Power Industry

3:40 PM Break

4:00 PM

Diffusion Kinetics, Interface Compound Formation and Radiation Responses of U-Fe and U-Ni Diffusion Couples: *Tianyi Chen*¹; Chao-Chen Wei¹; Travis Smith¹; Di Chen¹; Rory Kennedy²; Bulent Sencer²; Lin Shao¹; ¹Texas A&M University; ²Idaho National Laboratory

4:20 PM

Fission Product Distribution Patterns as a Comparative Characterization Tool for TRISO Fuel Performance: *Isabella van Rooyen*¹; Connie Hill¹; Tammy Trowbridge¹; ¹Idaho National Laboratory

4:40 PM

Hydrogen Embrittlement Testing of a Zirconium Based Alloy: *Paul Korinko*¹; Robert Sindelar¹; Ronald Kesterson¹; Thad Adams¹; ¹Savannah River National Laboratory

5:00 PM

Interdiffusion between Lanthanides and Cladding through the Vanadium Carbide Coating Obtained From Low-Temperature Chemical Vapor Deposition: *Wei-Yang Lo*¹; Shaosong Huang¹; Nicolas Silva¹; Yong Yang¹; ¹University of Florida

Materials Processing Fundamentals — Casting, Solidification, and Steel Processing

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: James Yurko, Materion Brush Beryllium and Composites; Antoine Allanore, Massachusetts Institute of Technology; Lifeng Zhang, University of Science and Technology Beijing; Jonghyun Lee, University of Massachusetts; Laura Bartlett, Texas State University

Monday PM	Room: Grand Harbor Salon 3
March 16, 2015	Location: Yacht & Beach

Session Chair: Laura Bartlett, Texas State University

2:00 PM

Fundamentals of Mold Flux Behavior for Continuous Casting: *Eun-yi Ko*¹; Il Sohn²; ¹POSCO; ²Yonsei University

2:20 PM

Numerical Simulation of the Coupled Turbulent Flow, Heat and Solute Transport in the Turbulent Flow Region of Slab Continuous Casting: *Huabiao Chen*¹; Dengfu Chen¹; Lintao Gui¹; Mujun Long¹; Yunwei Huang¹; Youguang Ma¹; ¹Chongqing University

2:40 PM

Interphase Evolution and Defect Formation during Horizontally Directional Solidification Process of Sn-Zn Alloys: Alicia Ares¹; Alex Iván Kociubczyk²; Wilky Desrosin²; Lucía Mabel Boycho³; Carlos Enrique Schvezov²; ¹CONICET/FCEQyN-UNaM; ²IMAM (CONICET-UNaM); ³CEDIT-Misiones Province.

3:00 PM

Effect of Technological Parameters on Mold Powder Entrainment by Water Model Study: *Lizhi Zhang*¹; Yugang Li¹; Qian Wang¹; Cheng Yan¹; ¹Chongqing University

3:20 PM Break

3:35 PM

Thermoelectric Magnetic Flow in Directional Solidification of Al-Cu Alloy and Its Influence on Solid-Liquid Interface Shape: *Jiang Wang*¹; Zhongming Ren¹; Yves Fautrelle²; Xi Li¹; Yunbo Zhong¹; ¹Shanghai University; ²SIMAP/ EPM

3:55 PM

An Atom Probe Study of Kappa Carbide Precipitation in Austenitic Lightweight Steel and the Effect of Phosphorus: *Laura Bartlett*¹; David Van Aken²; Dieter Isheim³; Julia Medvedeva²; ¹Texas State University; ²Missouri University of Science and Technology; ³Northwestern University

4:15 PM

Equivalency Comparison of Heat Transfer Coefficient in Liquid and Gas Quenches: Yuan Lu¹; Yiming Rong¹; Richard Sisson¹; ¹Worcester Polytechnic Institute

4:35 PM

Determination of Cavity Profile Induced by Supersonic Jets Impinging onto Liquids Surface: *Qiang Li*¹; Mingming LI¹; Mingxia Feng²; Zongshu ZOU¹; ¹Northeastern University; ²Liaoning Institute of Science and Technology

4:55 PM

Investigation On Non-Metallic Inclusions of IF Steel in RH Refining Process: *Shunxi Wang*¹; Jiongming Zhang¹; Wei Song¹; Yi Liu¹; ¹School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing

MHD 2015: Nagy El-Kaddah Memorial Symposium on Magnetohydrodynamics (MHD) in Materials Processing — Electromagnetic Containment

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee Program Organizers: Ramana Reddy, The University of Alabama;

Thinium Natarajan, U. S. Steel

Monda	ıy P	M
March	16,	2015

Room: Swan 2 Location: Swan

Session Chairs: Sherman McElroy, Intel Corporation; Stephen Ritchie, The University of Alabama

2:00 PM Introductory Comments

2:05 PM Invited

Applications of Electromagnetic Levitation in Extractive/Process Metallurgy Research: David Robertson¹; ¹Missouri S&T

2:30 PM Invited

Instabilities in Electromagnetic Quasi-Levitation: *Yves Fautrelle*¹; ¹Grenoble Institute of Technology

2:55 PM Invited

Electromagnetic Levitation Studies on Decarburization of Liquid Fe-Cr-C Alloys: *Ramana Reddy*¹; P.K. Rao²; ¹The University of Alabama; ²Indian Institute of Technology

3:20 PM

Gas Heating and Chemical Dissociation: Yves Delannoy¹; Guy Chichignoud²; ¹Univ Grenoble Alpes, SIMaP; ²Univ. Grenoble Alpes, SIMaP

3:45 PM Break

4:00 PM Invited

Modeling of Coupled Electromagnetic and Flow Fields in Induction Crucible Furnace: *Jerzy Barglik*¹; ¹Silesian University of Technology

4:25 PM

Numerical Analysis of Electromagnetic Levitation Employing Meshless Method Based on Weighted Least Square Method: *Shuhei Matsuzawa*¹; Kenta Mitsufuji¹; Yurika Miyake¹; Katsuhiro Hirata¹; Fumikazu Miyasaka¹; 'Osaka University

MONDAY PM

4:50 PM Invited

Velocity Measurements and Particle Laden Flow Experimental Investigations in Liquid Metals: Mihails Šcepanskis¹; *Toms Beinerts*²; Andris Bojarevics²; Andris Jakovics¹; ¹University of Latvia; ²Institute of Physics of University of Latvia

Micromechanics of Structurally Inhomogeneous Materials: An FMD Symposium in Honor of Armen Khachaturyan — Martensitic Transformations

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee *Program Organizers:* Long Qing Chen, Penn State University; Mark Asta, University of California, Berkeley; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yongmei Jin, Michigan Technological University; Yann Le Bouar, LEM, CNRS/ ONERA

Monday PM	Room: Asia 3
March 16, 2015	Location: Dolphin

Session Chair: Yunzhi Wang, Ohio State University

2:00 PM Invited

Microstructure-Property Relations in Dislocated Martensitic Steel: *John Morris*¹; Chris Kinney¹; Liang Qi¹; Ken Pytlewski²; Armen Khachaturyan¹; ¹University of California Berkeley; ²Anamet, Inc.

2:30 PM Invited

Coupled Kinetic Monte Carlo-Finite Element Mesoscale Simulation of Reversible Thermoelastic Martensitic Transformations: *Ying Chen*¹; ¹Rensselaer Polytechnic Institute

3:00 PM Invited

Atomic Scale Modeling of Microstructural Evolution: *Helena Zapolsky*¹; Armen Khachaturyan²; ¹University of Rouen; ²University of California and Rutgers University

3:30 PM Break

3:50 PM Invited

Pressure Induced Alpha to Epsilon Transformation in Iron at 15 GPa: Modeling and Experiment: Christophe Denoual¹; Aurélien Vattré¹; ¹CEA

4:20 PM Invited

Pathway of the Mixed-Mode Phase Transformation in the Zr-U System : Srikumar Banerjee¹; ¹Bhabha Atomic Research Centre

4:50 PM

Numerical Investigation of the Interaction between the Martensitic Transformation Front and the Plastic Strain in Austenite: Julia Kundin¹; Heike Emmerich¹; ¹University Bayreuth

Microstructural Processes in Irradiated Materials – Ferritic/Martensitic Alloys

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Dane Morgan, University of Wisconsin -Madison; Thak Sang Byun, Oak Ridge National Laboratory; Yasuyoshi Nagai, Tohoku University; Zhijie Jiao, University of Michigan; Kai Nordlund, University of Helsinki; Ming-Jie Zheng, University of Wisconsin

Monday PM March 16, 2015 Room: Asia 1 Location: Dolphin

Funding support provided by: Idaho National Laboratory Oak Ridge National Laboratory

Session Chairs: Zhijie Jiao, University of Michigan; Janelle Wharry, Boise State University

2:00 PM

Role of Alloy Variation on Swelling Behavior in Self-Ion Irradiated Ferritic-Martensitic Steel: *Elizabeth Getto*¹; Zhijie Jiao¹; Kai Sun¹; Gary Was¹; ¹University of Michigan

2:15 PM

Void Swelling Behavior in High Dose Ion Irradiated Ferritic-Martensitic Steels: Xu Wang¹; Lumin Wang¹; ¹University of Michigan

2:30 PM

Progress on Understanding Helium-Displacement Damage Interaction Effects on Void Swelling in Tempered Martensitic Steels: *G. Robert Odette*¹; Takuya Yamamoto¹; Yuan Wu¹; Peter Wells¹; Stephan Kraemer¹; Hee Joon Jung²; Danny Edwards²; Richard Kurtz²; ¹University of California Santa Barbara; ²Pacific Northwest National Laboratory

2:45 PM

On The Effects of Helium-dpa Interactions on Cavity Evolutions in Tempered Martensitic Steels: Analyses of Dual Ion Irradiations Data: *Takuya Yamamoto*¹; G. Robert Odette¹; Yuan Wu¹; Sosuke Kondo²; Akihiko Kimura²; ¹University of California Santa Barbara; ²Kyoto University

3:00 PM

The Capillarity Equation at the Nanoscale: He Trapping at Grain Boundaries: *Alfredo Caro*¹; Daniel Schwen¹; Enrique Martinez¹; ¹Los Alamos National Laboratory

3:15 PM

Strength Factor of Voids and He Bubbles in BCC Fe: Kiyohiro Yabuuchi¹; Ryosuke Nakai¹; Kouki Kasumi¹; Shuhei Nogami¹; Akira Hasegawa¹; ¹Tohoku University

3:30 PM Break

3:45 PM

Cluster Dynamics Modeling of Irradiation Induced Defects in Ferritic Alloys: *Aaron Kohnert*¹; Brian Wirth¹; Cem Topbasi²; ¹University of Tennessee; ²Pennsylvania State University

4:00 PM

Strengthening Mechanisms Due to Hard Obstacles in Ferritic Alloys: Yury Osetskiy¹; Roger Stoller¹; ¹Oak Ridge National Laboratory

4:15 PM

Multiscale Simulations of Strengthening Induced by Radiation-Induced Cr Precipitates: Ghiath Monnet¹; ¹EDF

4:30 PM

Precipitation Evolution in HT9 at High Dose: *Zhijie Jiao*¹; Elizabeth Getto¹; Anthony Monterossa¹; Kai Sun¹; Gary Was¹; ¹University of Michigan

4:45 PM

Radiation-Induced Segregation at High Doses in Self-Ion Irradiated F/M Alloys: Janelle Wharry¹; Anthony Monterrosa²; Gary Was²; ¹Boise State University; ²University of Michigan

www.tms.org/TMS2015

5:00 PM

A TEM Study of the Effect of Neutron Irradiation on the Microstructure of Fe-Cr Alloys: *Dhriti Bhattacharyya*¹; Yuan Wu²; Joel Davis¹; Robert Harrison¹; Emmanuelle Marquis³; Takuya Yamamoto²; G. Robert Odette²; ¹ANSTO; ²University of California Santa Barbara; ³University of Michigan

5:15 PM

Influence of Electronic Stopping on Radiation-Induced Defect Formation in Iron: Roger Stoller¹; ¹Oak Ridge National Laboratory

5:30 PM

Thermal and Irradiation Response of CORRAX Steel: Insight into the

Revert Austenite Transformation: *Djamel Kaoumi*¹; Joshua Ramsey¹; Peter Hosemann²; Z. Huang³; S.A. Maloy³; ¹The University of South Carolina; ²University of California Berkeley; ³Los Alamos National Laboratory

Multiscale Microstructure, Mechanics and Prognosis of High Temperature Alloys — Atomistic and Mesoscale Modeling

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: High Temperature Alloys Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Mark Tschopp, Army Research Laboratory; Jeffrey Evans, University of Alabama in Huntsville; Jonathan Cormier, ENSMA / Institut Pprime - UPR CNRS 3346; Qiang Feng, University of Science and Technology Beijing

Monday PM	Room: Oceanic 7
March 16, 2015	Location: Dolphin

Session Chairs: Mark Tschopp, Army Research Laboratory; Avinash Dongare, University of Connecticut

2:00 PM Invited

Ni-Based Superalloy Casting Parameters from Ab-Initio Molecular Dynamic Simulations: Christopher Woodward¹; James Lill²; Jonathan Miller¹; ¹Air Force Research Laboratory; ²High Performance Computing Modernization Program

2:20 PM

Discrete Dislocation Plasticity Simulations of Rate Effects with Solute and Vacancy Diffusion: Run Zhu¹; *Srinath Chakravarthy*¹; ¹Northeastern University

2:40 PM Invited

Temperature Dependent Deformation Mechanisms Via Ab-Initio Methods: *Ajey Venkataraman*¹; Michael Sangid¹; ¹Purdue University

3:00 PM

Atomistic Simulation of Shear-Behavior of γ/γ Interfaces in TiAl Lamellar Microstructures: *Mansour Kanani*¹; Rebecca Janisch¹; Alexander Hartmaier¹; ¹Interdisciplinary Centre for Advanced Materials Simulation (ICAMS), Ruhr-Universität Bochum

3:20 PM Break

3:40 PM Invited

Atomistic Simulations of Dislocation-Interface Interactions in the γ/γ' Microstructure in Ni-Based Superalloys: Juan Wang¹; Julien Guénolé¹; *Erik Bitzek*¹; ¹Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

4:00 PM Invited

Modeling Precipitate Shearing in Superalloys: Duchao Lv¹; Donald McAllister¹; Michael Mills¹; *Yunzhi Wang*¹; ¹Ohio State University

4:20 PM

Atomic Scale Modeling of High Temperature Deformation and Failure of FCC and HCP Metals: *Avinash Dongare*¹; Karoon Mackenchery¹; Garvit Agarwal¹; ¹University of Connecticut

4:40 PM Invited

Predicting Fundamental Properties for Accelerated Materials Design of High Temperature Alloys: Zi-Kui Liu¹; ¹The Pennsylvania State University

Nanocomposites III — Polymer Nanocomposites I

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Muralidharan Paramsothy, National University of Singapore, NanoWorld Innovations (NWI); Meisha Shofner, Georgia Institute of Technology; Changsoo Kim, University of Wisconsin-Milwaukee

Monday PM	Room: Europe 2
March 16, 2015	Location: Dolphin

Session Chair: Chang-Soo Kim, University of Wisconsin-Milwaukee

2:00 PM Keynote

High Power Factor, Completely Organic, Nanotube-Filled Thermoelectric Polymer Nanocomposites: *Jaime Grunlan*¹; Choongho Yu¹; Gregory Moriarty¹; ¹Texas A&M University

2:40 PM Invited

Controlling Nanoparticle Microstructure, Dispersion, and Rheology in Polymer Nanocomposites.: David Green¹; ¹University of Virginia

3:20 PM Break

3:40 PM

Highly-Loaded Cellulose Nanocrystal/Poly(Vinyl Alcohol) Composites: Caitlin Meree¹; Gregory Schueneman²; J. Carson Meredith¹; *Meisha Shofner*¹; ¹Georgia Institute of Technology; ²USDA Forest Service Forest Products Laboratory

4:00 PM

Environmental Degradation of Carbon Nanofiber Reinforced Syntactic Foams: *Steven Eric Zeltmann*¹; Ronald Poveda¹; Nikhil Gupta¹; ¹New York University

4:20 PM

Improved Laser-Induced Thermal Degradation Resistance of Polymer Nanocomposites: *Stephen Bartolucci*¹; Jeffrey Warrender¹; Karen Supan²; ¹US Army ARDEC; ²Norwich University

4:40 PM

FEM Investigation of Field Effects Processing and Designed Microstructural Toughening in Nanoparticulate Reinforced Composites: *Garrett Nygren*¹; ¹University of Miami

5:00 PM

Characterization of Polymer Nanocomposites: *Brigitte Wendel*¹; Breanne Martin¹; Kiara Pontious¹; Perrin Godbold¹; Kyle Gipson¹; ¹James Madison University

5:20 PM

Fabrication of a Nanofibrous Mat with Geometric Uniformity: Young Hun Jeong¹; ¹Kyungpook National University

Nanostructured Materials for Rechargeable Batteries and for Supercapacitors III — Session II: Supercapacitors

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee Program Organizers: Reza Shahbazian-Yassar, Michigan Technological University; Yan Yao, University of Houston; David Mitlin, Clarkson University

/londay PM	Room: Europe 3
/larch 16, 2015	Location: Dolphin

Session Chairs: David Mitlin, University of Alberta; Jagit Nanda, Oak Ridge National Laboratory

2:00 PM Invited

Cotton Templated Transition Metal Oxide/Graphene Hybrid Composites for Flexible High-Performance Supercapacitors: Xiaodong Li¹; ¹University of Virginia

2:25 PM Invited

Imaging the Structure of Ionic Liquids on Charged Surfaces: *Nina Balke*¹; ¹Oak Ridge National Laboratory

2:50 PM Invited

Design and Performance of Microfabricated Supercapacitors on Flexible Platforms: *Husam Alshareef*¹; Narendra Kurra¹; Nuha Alhebshi¹; ¹King Abdullah University of Science & Technology (KAUST)

3:15 PM Invited

Electrical Cables that Store Energy? Zenan Yu¹; *Jayan Thomas*¹; ¹University of Central Florida

3:40 PM Break

4:05 PM Invited

Surface Modification of Highly Porous Carbon for Enhanced Electric Double Layer Capacitors (EDLCs): *Guozhong Cao*¹; ¹University of Washington

4:30 PM Invited

1D, 2D and 3D Nanocombinatorial Approaches for Supercapacitor Electrodes: *Pooi See Lee*¹; ¹Nanyang Technological University

4:55 PM Invited

Scalable Ambient Hydrolysis Deposition for Capacitive Energy Storage: *Xiulei* (*David*) *Ji*¹; Vadivukarasi Raju¹; Xingfeng Wang¹; ¹Oregon State University

Neutron and X-Ray Studies of Advanced Materials VIII: Diffraction Limit and Beyond — Space and Time Resolved II

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Brent Fultz, California Institute of Technology; Peter Liaw, University of Tennessee; Jaimie Tiley, Air Force Research Laboratory

Monday PM	Room: Pelican 1
March 16, 2015	Location: Swan

Funding support provided by: Air Force Research Laboratory

Session Chairs: Chen Li, Oak Ridge National Laboratory; Thomas Watkins, Oak Ridge National Laboratory

2:00 PM Keynote

Microbeam X-ray and Ultra-Small-Angle X-ray Scattering Measurements of Additive Manufactured Metals: *Lyle Levine*¹; Andrew Allen¹; Fan Zhang¹; Ruqing Xu²; Jan Ilavsky²; ¹National Institute of Standards and Technology; ²Argonne National Laboratory

2:40 PM Invited

Effect of Particle Size on Diffraction from Nanoparticle Powder Aggregates: Hande Ozturk¹; Hanfei Yan²; John Hill²; *IC Noyan*¹; ¹SEAS Columbia University; ²Brookhaven National Laboratory

3:10 PM Invited

On the Misalignments of a High-Energy X-ray Diffractometer and the Accuracy of Cell Parameter Measurements: Loïc Renversade¹; Peter Kenesei²; Jonathan Wright³; Andras Borbely¹; ¹Ecole des Mines de Saint-Etienne; ²Advanced Photon Source; ³European Synchrotron Radiation Facility

3:40 PM Break

3:50 PM

Anisotropic Thermal Transport in Thermoelectric CrSb₂: *Chen Li*¹; Olivier Delaire¹; Jiawang Hong¹; Brian Sales¹; Matt Stone¹; Barry Winn¹; Jie Ma¹; Doug Abernathy¹; Tao Hong¹; Georg Ehlers¹; Jennifer Niedziela¹; Jeff Lynn²; ¹Oak Ridge National Laboratory; ²NIST Center of Neutron Research

4:10 PM Invited

Energy Selective Neutron Transmission for Determination of H Concentration and Diffusion Rates in Zirconium: *Mark Daymond*¹; Javier Santisteban²; Laura Barrow³; Anton Tremsin⁴; ¹Queen's University; ²Centro Atomico Bariloche; ³AMG Superalloys; ⁴University of California Berkeley

4:40 PM Invited

High Resolution Diffraction Analysis Using Nanometer-Sized Electron Probes and Applications for Materials Characterization: *Jian Min Zuo*¹; Yang Hu¹; Honggyu Kim¹; ¹University of Illinois

5:10 PM Invited

Quantitative Microstructural Imaging by Synchrotron Laue Diffraction: Nobumichi Tamura¹; Martin Kunz¹; *Arief Budiman*²; ¹Lawrence Berkeley National Laboratory; ²Singapore University of Technology and Design

New Horizons for Mechanical Spectroscopy in Materials Science — Dislocations, Crystals, Meta-Materials and Applications

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Nicolás Mujica, Universidad de Chile; Michael Demkowicz, MIT; Fernando Lund, Universidad de Chile; Alfredo Caro, Los Alamos National Laboratory

Monday PM March 16, 2015 Room: Macaw 1 Location: Swan

Session Chair: Michael Demkowicz, Massachusetts Institute of Technology

2:00 PM Invited

Atomistic Investigation of Dynamic Dislocation Properties in FCC Metals: *Erik Bitzek*¹; Daniel Weygand²; Yuanfeng Cheng²; Peter Gumbsch²; ¹Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU); ²Karlsruhe Institute of Technology (KIT)

2:30 PM Invited

Exploiting Resonances to Tailor the Acoustic Properties of Phononic Crystals and Metamaterials: J.H. Page¹; ¹University of Manitoba

3:00 PM

The Bordoni Peak in Internal Friction at the Atomic Scale: Mauricio Morales¹; Fernando Lund¹; Alfredo Caro²; ¹Universidad de Chile; ²Los Alamos National Laboratory

3:20 PM

Non-Destructive Bulk HCP Texture from Ultrasound: A Solution to the Inverse Problem: *Bo Lan*¹; Michael Lowe²; Fionn Dunne²; ¹Oxford University; ²Imperial College London

3:40 PM Break

4:00 PM Invited

Linear and Nonlinear Acoustic Lenses: From Sound Bullets to Acoustic Edge Detection: *Miguel Moleron*¹; Paul Anzel²; Marc Serra Garcia¹; Chiara Daraio¹; ¹ETH Zurich; ²California Institute of Technology

4:30 PM

Resonant Ultrasound Spectroscopy of Irradiated HT-9 Duct Material: Tarik Saleh¹; Stuart Maloy¹; Tobias Romero¹; ¹Los Alamos National Laboratory

Novel Synthesis and Consolidation of Powder Materials — Novel Consolidation of Powder Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: Ma Qian, RMIT University (Royal Melbourne Institute of Technology); Iver E Anderson, The Ames Laboratory

Room: Swan 10 March 16, 2015 Location: Swan

Session Chairs: Paul Prichard, Innovation Ventures Group; Young Do Kim, Hanyang University

2:00 PM

Monday PM

Consolidation of Cemented Tungsten Carbide with Non-Traditional Metal Binders: James Cahill¹; Olivia Graeve¹; ¹University of California San Diego

2:20 PM

Fabrication of Diamond-WC-Based Cemented Carbide Composites by Microwave Sintering: Quanchao Gu¹; Lei Xu¹; Jinhui Peng¹; Yi Xia¹; Libo Zhang1; Shaohua Ju1; Chenglong Wei1; 1The Key Laboratory of Unconventional Metallurgy, Ministry of Education, Kunming University of Science and Technology

2:40 PM

Microstructure and Mechanical Properties of Bulk Nanostructured Cu-Ta Alloys Consolidated by Equal Channel Angular Extrusion: Laszlo Kecskes1; Kris Darling1; Mark Tschopp1; Rojhirunsakool Tanaporn2; Rajarshi Banerjee²; Ganga Purja Pun³; Yuri Mishin³; ¹ARL; ²University of North Texas; ³George Mason University

3:00 PM

Photocatalytic Degradation of Rhodamine B over Dy-Doped TiO2 Film Synthesized through Microwave Sintering: Wang Hongwei¹; Bingchang Li¹; ¹Shaanxi Energy Vocational and Technological College

3:20 PM Break

3:40 PM

Densification of High Purity Aluminum Nitride by Plasma Activated Sintering: Meijuan Li¹; Dandan Wang¹; Chuanbin Wang¹; Qiang Shen¹; ¹Wuhan University of Technology

4:00 PM Invited

Using Energy Efficient Microwaves to Synthesize High Performance Energy Saving Magnesium (Nano) Composites: Manoj Gupta¹; S Sankaranarayanan1; 1National University of Singapore

4:25 PM

Continuous-Heating Ignition Testng of Hybrid Al-Ni-CuO Reactive Composites Fabricated by Ultrasonic Powder Consolidation: Somayeh Gheybi Hashemabad1; Teiichi Ando1; 1Northeastern University

4:45 PM

Use of Spark Plasma Sintering for Producing Compositionally Graded Austenitic Stainless Steel/Titanium Samples: Naveen Kumar¹; G. D. Janaki Ram1; S.S. Bhattacharya1; 1Indian Institute of Technology Madras

5:05 PM

Nano-Phase Separation Sintering for the Manufacture of Bulk Nanocrystalline Alloys: Mansoo Park1; Christopher Schuh1; 1MIT

5:25 PM

Minimizing Surface Oxidation of Tungsten Nanopowders: Scott Middlemas1; Brady Butler1; David Runk1; 1Army Research Laboratory

Pb-Free Solders and Emerging Interconnect and Packaging — 3D Microelectronic Packages

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Electronic Packaging and Interconnection Materials Committee Program Organizers: John Elmer, Los Alamos National Laboratory; Yan Li, Intel Corp.; Andre Lee, Michigan State University; Fan-Yi Ouyang, National Tsing Hua University; Srini Chada, Schlumberger; Kyu-Oh Lee, Intel Corp.; Kwang-Lung Lin, National Cheng Kung University; Christopher Gourlay, Imperial College; Daniel Lewis, Rensselaer Polytechnique Institute; Fan Gao, U. Masachusetts Lowell

Monday PM	Room: Lark
March 16, 2015	Location: Swan

Session Chairs: Yan Li, Intel Corporation; Fay Hua, Intel Corporation

2:00 PM Invited

Packaging and Failure Analysis Challenges in Advanced 3D Packages: Purushotham Srinath1; Yan Li; Deepak Goyal1; 1Intel Corporation

2:25 PM

Deformation of Copper through Silicon via under Thermal Cycling: H. Ma1; J. Guo1; Q. Zhu1; J. Shang2; 1Institute of Metal Research; 2University of Illinois

2:50 PM

Development of a Fracture Mechanism Map for Thin Solder Joints with High Intermetallic Content: Babak Talebanpour¹; Indranath Dutta¹; Ganesh Subbarayan²; ¹Washington State University; ²Purdue University

3:15 PM

Electromigration in 3D-IC Scale Cu/Sn/Cu Solder Joints: Md. Arifur Rahman¹; Cheng-En Ho¹; T. H. Yang¹; C. H. Yang¹; C. N. Chen¹; ¹Yuan Ze University

3:40 PM Break

3:55 PM

In Situ Observations of Micromechanical Behaviours of Intermetallic Compounds for Structural Applications in 3D IC Micro Joints: Jen-Jui Yu1; Jui-Yang Wu1; Li-Jen Yu1; C. Kao1; 1National Taiwan University

4:20 PM

Study of Grain Size and Orientation of 30 µm Solder Microbumps Bonded by Thermal Compression: Yu-An Shen1; Chih Chen1; 1National Chiao Tung University

4:45 PM

Low-Temperature and Low-Pressure Direct Copper-to-Copper Bonding: Chien-Min Liu1; Han-wen Lin1; Chih Chen1; 1National Chiao Tung University

5:10 PM

Thiol-Based Self-Assembled Monolayers (SAMs) as an Alternative Surface Finish for 3D Cu Microbumps: Silvia Armini¹; Yannick Vandelaer¹; Alicja Lesniewska¹; Vladimir Cherman¹; Inge De Preter¹; Fumihiro Inoue¹; Jaber Derakhshandeh1; George Vakanas2; Eric Beyne1; 1imec; 2Intel Corporation NV/SA

Phase Transformations and Microstructural Evolution — Crystallization and Diffusional Transformations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Soumya Nag, University of North Texas; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama ; Amy Clarke, Los Alamos National Laboratory; Frederic Danoix, CNRS - Université de Rouen; Emmanuelle Marquis, University of Michigan

Monday PM	Room: Swan 3
March 16, 2015	Location: Swan

Session Chairs: Eren Kalay, Middle East Technical University; Ashley Paz y Puente, Northwestern University

2:00 PM

Microstructural Analysis of Laser Surface Melted Pd-Si and Zr-Cu Alloys: *Fanqiang Meng*¹; Emrah Simsek¹; Shihuai Zhou¹; Matt Besser¹; Ryan Ott¹; ¹Ames Laboratory

2:20 PM

Prenucleation Clustering in Supercooled Liquid and Amorphous Marginal Metallic Glasses: *Mert Ovun*¹; Mustafacan Kutsal¹; Eren Kalay¹; ¹METU

2:40 PM Invited

Study of Phase Precipitation in Binary Systems Using the Diffusion-Multiple Approach: *Qiaofu Zhang*¹; Ji-Cheng Zhao¹; ¹The Ohio State University

3:10 PM

Ostwald's Step Rule in the Crystallization of Supercooled Magnesium from Molecular Dynamics Simulation: *Junjiang Xiao*¹; Yongquan Wu¹; Rong Li¹; ¹Shanghai University

3:30 PM Break

3:50 PM

Use of XRD to Determine the Crystallinity and Crystallite Sizes of Reduce Graphene Oxide Cement Composite in the First 24-Hour of Hydration: *Baig Abdullah Al Muhit*¹; BooHyun Nam¹; Lei Zhai¹; ¹University of Central Florida

4:10 PM Invited

Phase and Kirkendall Void Evolution Study in Aluminized Ni-Cr Wires via *Ex Situ* Annealing and *In Situ* X-ray Tomographic Microscopy Experiments: *Ashley Paz y Puente*¹; Dinc Erdeniz¹; Julie Fife²; David Dunand¹; ¹Northwestern University; ²Paul Scherrer Institut

Phase Transformations and Microstructural Evolution — Iron Chromium Alloys II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Soumya Nag, University of North Texas; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama ; Amy Clarke, Los Alamos National Laboratory; Frederic Danoix, CNRS - Université de Rouen; Emmanuelle Marquis, University of Michigan

Monday PM	Room: Swan 1
March 16, 2015	Location: Swan

Session Chairs: Emmanuelle Marquis, University of Michigan; Philippe Maugis, CNRS

2:00 PM Invited

Kinetics of Spinodal Decomposition during Ageing of a Precipitation Hardened Martensitic Stainless Steel: Laurent Couturier¹; Frédéric De Geuser²; *Alexis Deschamps*¹; ¹Grenoble Institute of Technology; ²CNRS, SIMAP

2:40 PM

Thermal Embrittlement of Duplex Stainless Steels: *Julie Tucker*¹; Michael Miller²; George Young³; ¹Oregon State University; ²Oak Ridge National Laboratory; ³Knolls Atomic Power Laboratory

3:00 PM

Characterization of Nuclear Materials Using Combined TEM and Atom Probe Tomography: *Peter Wells*¹; Stephan Kraemer¹; Yuan Wu¹; Takuya Yamamoto¹; G. Odette¹; ¹University of California Santa Barbara

3:20 PM Break

3:40 PM

Microstructural Evolution of Lean Duplex Stainless Steels during Isothermal Ageing: Jean-Yves Maetz; *Sophie Cazottes*¹; Frederic Danoix; C. Verdu¹; X. Kleber¹; ¹INSA-Lyon

4:00 PM Invited

Effect of Homogenization Microstructure on Phase Separation Kinetics during Subsequent Aging of Fe-Cr Alloys: *Peter Hedström*¹; Joakim Odqvist¹; Jing Zhou¹; Xin Xu¹; Mattias Thuvander²; ¹KTH - Royal Institute of Technology; ²Chalmers University

4:40 PM

Kinetics of Secondary Phase Precipitation during Spinodal Decomposition in Ferrite of Duplex Stainless Steels: A Kinetic Monte Carlo Model - Comparison with Atom Probe Tomography Experiments: *Cristelle Pareige*¹; Emo Jonathan¹; Christophe Domain²; Sebastien Saillet²; Philippe Pareige¹; ¹University of Rouen; ²EDF

5:00 PM

Analysis of Phase Decomposition in Fe-Cr Alloys by Diffusion Couples: Victor Lopez-Hirata¹; Orlando Soriano-Vargas²; Nicolas Cayetano-Castro³; Maribel Saucedo-Muñoz¹; Erika Avila-Davila⁴; Hector Dorantes-Rosales¹; ¹Instituto Politecnico Nacional (ESIQIE); ²Universidad Politécnica del Valle de Toluca; ³Instituto Politecnico Nacional (CNMN); ⁴Instituto Tecnologico de Pachuca

Polycrystalline Materials: Bringing Together Experiments, Simulations, and Analytic Theories — Session II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Dana Zöllner, Otto von Guericke University Magdeburg; Douglas Medlin, Sandia National Laboratories; Dmitri Molodov, RWTH Aachen

Monday PM March 16, 2015

Session Chairs: Anthony Rollett, Carnegie Mellon University; Matthias Militzer, The University of British Columbia

Room: Oceanic 8

Location: Dolphin

2:00 PM Invited

Combining Experiments, Mean-Field and Full-Field Modelling to Predict Microstructure Evolution during Thermomechanical Processing of Ni Base Superalloys: *Nathalie Bozzolo*¹; Roland E. Logé²; Marc Bernacki¹; ¹MINES ParisTech; ²EPFL

2:30 PM

An Investigation into the Effects of Thermomechanical History on the Microstructure of a Nickel-Base Superalloy during Forging: Sam Gardner¹; Richard Johnston¹; Wei Li²; Henry Illsley¹; ¹Swansea University; ²Rolls-Royce plc

2:50 PM

Mesoscale Modelling of Plastic Deformation and Subsequent Recrystallization: Role of GNDs and Capillarity Effects: *Roland Loge*¹; Ana Laura Cruz Fabiano²; Nathalie Bozzolo²; Marc Bernacki²; ¹EPFL; ²Mines Paristech

3:10 PM

Parallel Modeling of Recrystallization in a TWIP-Steel: Markus Kühbach¹; *Luis Barrales-Mora*²; Christian Haase¹; Dmitri Molodov¹; ¹Institut fuer Metallkunde und Metallphysik; ²Institut für Metallkunde und Metallphysik

3:30 PM Break

3:50 PM

Dynamic Behavior of a Nanocrystalline Cu-Ta Alloy: *Scott Turnage*¹; Kristopher Darling²; Mansa Rajagopalan¹; Mark Tschopp²; Kiran Solanki¹; ¹Arizona State University; ²Army Research Laboratory

4:10 PM

MONDAY PM

Plastic Anisotropy of Face-Centered-Cubic Materials: Roles of Textures and Dislocation Interactions: *Minh-Son Pham*¹; Adam Creuziger²; Mark Iadicola²; Timothy Foecke²; Anthony Rollett¹; ¹Carnegie Mellon University; ²National Institute of Standards and Technology

4:30 PM

A New Three Dimensional Thermo-Elasto-Viscoplastic Constitutive Model for FCC Polycrystals: Edward Cyr¹; Mohsen Mohammadi¹; Raja Mishra²; Kaan Inal¹; ¹University of Waterloo; ²General Motors Research & Development Center

4:50 PM

Microstructure and Mechanical Properties of Iron Based Shape Memory Alloy Severe Deformed by High Speed High Pressure Torsion: Gheorghe Gurau¹; Carmela Gurau¹; Hanna Myalska²; Meisam Kouhi Habibi³; *Mihaela Banu*³; ¹Dunarea de Jos University of Galati; ²Silesian University of Technolgy; ³University of Michigan

Rare Metal Extraction & Processing 2015 — Precious Metals

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee Program Organizers: Neale Neelameggham, Ind LLC; Shafiq Alam, University of Saskatchewan; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto Kennecott Utah Copper

Monday PMRoom: Asbury CMarch 16, 2015Location: Yacht & Beach

Session Chairs: David Dreisinger, Univ.of British Columbia; Shijie Wang, Rio Tinto

2:00 PM

Extraction of Gold from a Low-Grade Double Refractory Gold Ore Using Flotation-Preoxidation-Leaching Process: *Yongbin Yang*¹; Shiqian Liu¹; Bin Xu¹; Qian Li¹; Tao Jiang¹; Peng lv¹; ¹Central South University

2:20 PM

Gold Extraction from a High Carbon Low-Grade Refractory Gold Ore by Flotation-Roasting-Leaching Process: *Yongbin Yang*¹; Zhaohui Xie¹; Bin Xu¹; Qian Li¹; Tao Jiang¹; ¹Central South University

2:40 PM

Gold Leaching from a Refractory Gold Concentrate by the Method of Liquid Chlorination: *Hongxu Li*¹; Chao Li¹; Xie Yang¹; Shuai Wang¹; Lifeng Zhang¹; ¹University of Science and Technology Beijing

3:00 PM

The Effects of Common Associated Sulfide Minerals on Thiosulfate Leaching of Gold: *Yang Yongbin*¹; Zhang Xi¹; Xu Bin¹; Li Qian¹; Jiang Tao¹; ¹Central South University

3:20 PM Break

3:35 PM

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Hydrometallurgical Extraction of Precious, Rare and Base Metals Using an Oxidizing Acid Chloride Heap Leach: David Dreisinger¹; Niels Verbaan²; Ralph Fitch³; ¹University of British Columbia; ²SGS Canada Inc.; ³Trimetals Mining Inc.

3:55 PM

Recovery of Platinum Group Metals from Wasted Automobile Catalyst Using Perovskite-Type Oxide: *Koki Nagai*¹; Hiroki Kumakura¹; Shota Yanai¹; Takashi Nagai¹; ¹Chiba Institute of Technology

4:15 PM

Research on Process of Hydrometallurgical Extracting Au, Ag, and Pd from Decopperized Anode Slime: *Yongbin Yang¹*; Wei Yin¹; Tao Jiang¹; Qian Li¹; Bin Xu¹; ¹Central South University

Recent Developments in Biological, Structural and Functional Thin Films and Coatings — Session II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee

Program Organizers: Adele Carradò, IPCMS; Heinz Palkowski, Clausthal Univ of Technology; Roger Narayan, University of North Caroloina; Nuggehalli Ravindra, New Jersey Institute of Technology; Nancy Michael, University of Texas at Arlington

Monday PM	Room: Parrot
March 16, 2015	Location: Swan

Session Chairs: Adele Carradò, IPCMS University of Strasbourg; Heinz Palkowski, TU Clausthal

2:00 PM Keynote

Antibacterial DLC-Ag Coating for Long-Term High-Stable Applications: Maxime Cloutier¹; Stephane Turgeon¹; Jean-Jacques Pireaux²; *Diego Mantovani*¹; ¹Laval University; ²University of Namur

2:40 PM

The Microstructural and Mechanical Characterisations of Hydroxyapatite Coating Fabricated Using Nd:YAG Laser: *Monnamme Tlotleng*¹; Esther Akinlabi¹; Mukul Shukla¹; Sisa Pityana¹; ¹Council for Scientific and Industrial Research

3:00 PM Invited

Surface-Modified Biological Scaffold: A New Approach for Tissue Engineering: *Francesca Boccafoschi*¹; ¹University of Piemonte Orientale "A. Avogadro"

3:30 PM Break

3:50 PM Introductory Comments Introduce posters

4:20 PM Keynote

Biomimetic Layer-by-Layer Platform for the Promotion of Osseointegration: Fabien Gaudière¹; Khalil Abdelkebir¹; Béatrice Labat¹; Sandrine Morin¹; Jean-Pierre Vannier¹; Hassan Atmani¹; *Guy Ladam*¹; ¹University of Rouen

5:00 PM

Anodization of Ti-Based Alloys for Orthopedic Applications: In-Vitro Corrosion Resistance and Cytotoxicity Assessment: Vishal Musaramthota¹; Rupak Dua¹; ¹Florida International University

5:20 PM

Design of Oxide Interface Between Ca-P and Titanium Alloy: Quang Van Le¹; Geneviève Pourroy¹; Andrea Cochis²; Lia Rimondini²; Wafa Ismail Abdel-Fattah³; *Adele Carradò*¹; ¹IPCMS, UMR 7504 UDS-CNRS; ²Università del Piemonte Orientale Amedeo Avogadro; ³Biomaterials Department

Recycling and Sustainability Update — Recycling

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Randolph Kirchain, Massachusetts Institute of Technology; Jeffrey S. Spangenberger, Argonne National Laboratory

Monday PM March 16, 2015 Room: Grand Harbor Salon 4 Location: Yacht & Beach

Session Chair: Randolph Kirchain, Massachusetts Institute of Technology

2:00 PM

Sustainable Recycling Policies & Practices in India: Lakshmi Raghupathy¹; ¹Consultant Sustainable Development

2:20 PM

Understanding Copper Scrap Availability: *Stian Ueland*¹; Elsa Olivetti¹; Richard Roth¹; Randolph Kirchain¹; ¹MIT

2:40 PM

Investigation on Recycling of Ag from Pb-Cu-Ag Alloy by Vacuum Distillation: *Bingyi Song*¹; Wenlong Jiang¹; Bin Yang¹; Baoqiang Xu¹; Qitong Yang¹; Shuai Xu¹; Dachun Liu¹; ¹Kunming University of Science and Technology

3:00 PM

Recovery of Silver and Copper from Dental Amalgam Wastes via Hydrometallurgical Processes: Emre Yilmaz¹; *Selim Ertürk*¹; Cuneyt Arslan¹; Fatma Arslan¹; ¹Istanbul Technical University

3:20 PM

Solid State Regeneration of Recycled Metallic Materials by Powder Metallurgy Processes: *Deliang Zhang*; Jiamiao Liang; Xun Yao¹; Antoine Rault¹; Dengshan Zhou¹; Tian Xia¹; ¹Shanghai Jiao Tong University

3:40 PM Break

3:55 PM

Recycling of Sinter Plant Offgas Cleaning System Dust by Preagglomeration: Naiyang Ma¹; ¹ArcelorMittal

4:15 PM

Recovery of Metals from Waste Printed Circuit Boards by Leaching with 1-Ethyl-3-Methyl-Imidazolium Hydrogen Sulfate Ionic Liquid: *Tugba Atalay*¹; Ayfer Kiliçarslan¹; Muhlis Saridede¹; ¹Yildiz Technical University

4:35 PM

Use of Recycled Plastic Wastes Instead of Premium Gasesous Hydrocarbons as Feedstocks for Sustainable Synthesis of Carbon Nanotubes: Chuanwei Zhuo¹; *Yiannis Levendis*¹; ¹Northeastern University

4:55 PM

Application of 1-Methylimidazolium Hydrogen Sulfate Ionic Liquid to the Oxidative Leaching of Industrial Brass Dross for Recovery of Metals: *Ayfer Kiliçarslan*¹; Muhlis Saridede¹; ¹Yildiz Technical University

Refractory Metals 2015 — Mechanical Properties, Structure & Processing

Sponsored by: TMS Structural Materials Division, TMS: Refractory Metals Committee

Program Organizers: Gary Rozak, HC Starck Inc; S.K. Varma, University of Texas El Paso

Monday PM	Room: Europe 1
March 16, 2015	Location: Dolphin

Session Chair: Omer Dogan, Dept. of Energy

2:00 PM

Overview of Molybdenum 47.5% Rhenium: *Todd Leonhardt*¹; James Ciulik¹; ¹Rhenium Alloys Inc

2:20 PM

Insights into the Mechanical Behavior of Rhenium and its Alloys from Integrated Computational and Experimental Studies: *Mark Asta*¹; Maarten de Jong¹; Marcel Sluiter²; Josh Kacher¹; Liang Qi¹; David Olmsted¹; J. W. Morris¹; Axel van de Walle³; Andrew Minor¹; ¹University of California Berkeley; ²Delft University of Technology; ³Brown University

2:40 PM

Characterization and Modeling of the Quasi-static Behavior of Polycrystalline Molybdenum: Geremy Kleiser¹; Benoit Revil-Baudard¹; Oana Cazacu¹; ¹University of Florida

3:00 PM

A Strain-Rate and Temperature Dependent Constitutive Model for Tantalum-Tungsten Alloys: *Marko Knezevic*¹; Irene Beyerlein²; Andrew Richards²; Rodney McCabe²; ¹University of New Hampshire; ²Los Alamos National Laboratory

3:20 PM

Containerless Processing of Refractory Nb-Si Alloy by Electrostatic Levitation: *Liang Hu*¹; Shangjing Yang¹; Liuhui Li¹; Bingbo Wei¹; ¹Northwestern Polytechnical University

3:40 PM Break

3:50 PM

On the Deformation Behavior of Mo-Si-X (X = Ti, Zr, Hf) Solid Solution: Daniel Schliephake¹; Julia Wagner¹; *Martin Heilmaier*¹; ¹Karlsruhe Institute of Technology

4:10 PM

Effect of Titanium and Chromium on the Microstructure of Tungsten-Manganese Alloys Prepared by Mechanical Alloying: Ossama Elsebaie¹; Kevin Jaansalu¹; ¹Royal Military College of Canada

4:30 PM

Tungsten Grain Refinement via Low-Energy Cryogenic Ball Milling: *Frank Kellogg*¹; Clara Hofmeister²; Anit Giri³; Yongho Sohn²; Kyu Cho⁴; ¹Bowhead Science and Technology; ²University of Central Florida; ³TKC Global; ⁴US Army Research Laboratory

4:50 PM

Enhancement of Fracture Toughness for Mo-Si-B alloy: *Jong Min Byun*¹; Jung Jun Lee¹; Seong Lee²; Myung-Jin Suk³; Sung-Tag Oh⁴; Young Do Kim¹; ¹Hanyang University; ²Agency for Defense Development; ³Kangwon National University; ⁴Seoul National University of Science and Technology

5:10 PM

The Effects of Grain Size and Texture on Dynamic Abnormal Grain Growth in Mo: *Philip Noell*¹; Daniel Worthington²; Eric Taleff¹; ¹University of Texas at Austin, Dept of Mechanical Engrg; ²Fujifilm Dimatix, Inc

5:30 PM

Textures in Pure Mo Processed by Different Thermomehcanical Processes: *Tongguang Zhai*¹; Yan Jin¹; Lin Yang¹; Todd Leonhardt²; ¹University of Kentucky; ²Rhenium Alloys Inc.

Solar Cell Silicon — Crystallization and Mechanical Properties

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Gabriella Tranell, Norwegian University of Science & Technology; Yulia Meteleva-Fischer, Materials innovation institute M2i; Shadia Ikhmayies, AI Isra University; Arief Budiman, Singapore University of Technology and Design

Monday PM March 16, 2015 Room: Grand Harbor Salon 1 Location: Yacht & Beach

Session Chair: Arief Budiman, Singapore University of Technology and Design

2:00 PM Introductory Comments

2:05 PM

Enabling Thin Silicon Technologies for Next Generation c-Si Solar PV Renewable Energy Systems using Synchrotron X-Ray Microdiffraction as Stress and Crack Mechanism Probe: *Karthic Rengarajan*¹; G. Illya²; V. Handara²; W.A. Caldwell³; C. Bonelli⁴; Martin Kunz⁵; Nobumichi Tamura⁵; D. Verstraeten⁴; Budiman Arief¹; ¹Singapore University of Technology & Design; ²Center for Solar Photo Voltaics; ³Sun Power Corporation; ⁴Total Gas & Power; ⁵Advanced Light Source

2:30 PM

Silicon Purification by Segregation: Theory and Limits: Yves Delannoy¹; Kader Zaidat¹; ¹Univ. Grenoble Alpes, SIMAP

2:55 PM

Numerical Modeling of Stress Distribution in a Bi-Grain Small Scale Silicon Ingot Including Crucible Deformation: Sylvain Gouttebroze¹; Mohammed M'Hamdi¹; ¹SINTEF

3:20 PM Break

3:40 PM

Behavior for Nitrogen and Iron in the Bottom of Casting Multicrystalline Silicon Ingot: *Cong Zhang*¹; Kuixian Wei¹; Wenhui Ma¹; Jiao Li¹; Yongnian Dai¹; ¹Kunming University of Science and Technology

4:00 PM

Thermal Field Design and Optimization of Directional Solidification for Multicrystalline Silicon Growth: *WenHui Ma*¹; Xi Yang¹; Guoqiang Lv¹; ¹Kunming University of Science and Technology

4:25 PM

Use of Silicon for Solar Cell: Victor Onweazu¹; ¹Bridgehead Construction (Nig) Ltd

Structural Materials, Heat Transport Fluids, and Novel System Designs for High Power and Process Heat Generation — Heat Transport Fluids I

Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division (formerly EMPMD), TMS: Corrosion and Environmental Effects Committee, TMS: Energy Conversion and Storage Committee, TMS: Nuclear Materials Committee *Program Organizers*: Peter Hosemann, UC Berkeley; Peiwen Li, University of Arizona; Kumar Sridharan, University of Wisconsin; Bruce Pint, Oak Ridge National Laboratory

Monday PM	Room: Asbury B
March 16, 2015	Location: Yacht & Beach

Session Chairs: Peter Hosemann, University of California, Berkeley; Bruce Pint, Oak Ridge National Laboratory

2:00 PM Invited

The SunShot Initiative: New Opportunities for Applied Materials R&D in Concentrating Solar Power: Levi Irwin¹; ¹US Department of Energy

2:40 PM

Minimum System Entropy Production for the Figure of Merit of High Temperature Heat Transfer Fluid Properties: *Peiwen Li*¹; Ye Zhang¹; ¹University of Arizona

3:00 PM

Materials Compatibility in Dish-Stirling Solar Generators using Cu-Si-Mg Eutectic for Latent Heat Storage: *Elizabeth Withey*; A Kruizenga¹; C Andraka¹; ¹Sandia National Laboratories

3:20 PM

Heat Transfer Property of Gas Jet Cooling in Confined Nozzle: Jin Yang¹; Wu Chengbo¹; *Zhang Jiangbin*¹; ¹Chongqing University

3:40 PM Break

4:00 PM Invited

Compatibility of Liquid Metals with Potential Structural Materials at High Temperatures: *Alfons Weisenburger*¹; Georg Müller¹; Annette Heinzel¹; Renate Fetzer¹; Adrian Jianu¹; ¹Institute for Pulsed Power and Microwave Technology, Karlsruhe Institute of Technology

4:40 PM

Corrosion Behavior of Steels After Exposure to High Flow Velocity Leadbismuth Eutectic (LBE) in the LANL DELTA Loop: *Magda Caro*¹; David Frazer²; Cristian Cionea²; Chloe Rose²; Keith Woloshun¹; Stuart Maloy¹; Peter Hosemann²; ¹Los Alamos National Laboratory; ²University of California Berkeley (UCB)

5:00 PM

Comparison of Static and Flowing Corrosion of Fe-12Cr-2Si by Molten Lead-Bismuth Eutectic: Elliott Fray¹; Khalil Hill²; Magdalena Serrano De Caro³; *Michael Short*¹; Ronald Ballinger¹; ¹MIT; ²Pennsylvania State University; ³Los Alamos National Laboratory

5:20 PM

New Alternatives in Liquid Metal Eutectics for Application in Solar Concentrators and as Coolants in Generation IV Nuclear Power Plants: Sn-Pb, Sn-Bi and Sn-Pb-Bi Systems: *Miroslav Popovic*¹; Alan Bolind¹; Mark Asta¹; Yerbol Aussat¹; Peter Hosemann¹; ¹University of California Berkeley

5:40 PM

Analyzing Mass Transfer in Nonisothermal Liquid Metal Systems Using Comprehensive Datasets: *Peter Tortorelli*¹; Steven Pawel¹; ¹Oak Ridge National Laboratory

2015 Functional Nanomaterials: Energy and Sensing — Sensing and Electronics I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee

Program Organizers: Jung-Kun Lee, University of Pittsburgh; Behrang Hamadani, National Institute of Standards and Technology; Sung Hun Wee, HGST, a Western Digital Company; Nitin Chopra, University of Alabama, Tuscaloosa; Terry Xu, The University of North Carolina at Charlotte; Jang-Sik Lee, Pohang University of Science and Technology (POSTECH) POSTECH

Tuesday AM	Room: Swan 4
March 17, 2015	Location: Swan

Session Chair: Terry Xu, The University of North Carolina at Charlotte

8:30 AM Invited

Illuminating Chemical Interfaces with Plasmonics: Jason Hafner¹; ¹Rice University

9:10 AM

Magnetostrictive and Ferroelectric Properties of CFO – BCZT Particulate Multiferroic Composites: *Vinitha Monaji*¹; Paul Praveen¹; Dibakar Das¹; ¹University of Hyderabad

9:30 AM Invited

The Next Big Thing in Photovoltaics: Perovskite Solar Cell: *Nam-Gyu Park*¹; ¹Sungkyunkwan University

10:10 AM Break

10:25 AM Invited

Detecting Bacteria by Surface Enhanced Raman Spectroscopy: *Yiping Zhao*¹; ¹University of Georgia

11:05 AM

Dynamic Probing of Microstructural Evolution by Magnetic Nanofluids: *Raju Ramanujan*¹; Z Wang¹; V. Verma¹; H. Xia¹; Z. Wang¹; ¹Nanyang Technological University

11:25 AM Invited

One-Dimensional Nanostructures for Wearable Devices: *Yong Zhu*¹; ¹North Carolina State University

6th International Symposium on High Temperature Metallurgical Processing — Fundamental Research of Metallurgical Process II

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Gerardo Alvear, Xstratatech; Onuralp Yucel, Istanbul Technical University; Xinping Mao, Wuhan Iron and Steel Corporation; Hong Yong Sohn, University of Utah; Naiyang Ma, ArcelorMittal; Phillip Mackey, P.J. Mackey Technology; Tom Battle, Midrex Technologies

Tuesday AM	Room: Swan 5
March 17, 2015	Location: Swan

Session Chairs: Mingming Zhang, ArcelorMittal Global R&D; Xuewei Lv, Chongqing University, China

8:30 AM

Solubility of Sc₂O₃ in Na₃AlF₆-K₃AlF₆-AlF₃ Melts: *Zhongliang Tian***¹; Xun Hu¹; Yanqing Lai¹; Shu Yang¹; Shaolong Ye¹; Jie Li¹; ¹Central South University**

8:50 AM

Formation Mechanism of 2CaO-SiO2 and 3CaO-P2O5 Solid Solution in CaO-SiO2-FetO-P2O5 Slags: *Xiaofei Dou*¹; Mingmei Zhu¹; Tiancheng Lin¹; Yu Wang¹; Bin Xie¹; Bin Zhu²; Hong Zhou²; ¹College of Materials Science and Engineering, Chongqing University,; ²Chongqing Iron and Steel Group Corporation

9:10 AM

Liquidus in the System Cu₂O - CaO - Al₂O₃ at 1250 °C: *Joseph Hamuyuni*¹; Pekka Taskinen¹; ¹Aalto University School of Chemical Technology

9:30 AM

The Substitutional Effects of TiO₂ and MnO for SiO₂ on the Wetting Properties in a Quaternary Slag System at High Temperature: *Jongbae Kim*¹; Il Sohn¹; ¹Yonsei University

9:50 AM

Cohering Behavior of Coal Ash with Pellet Scrap Powder and Relationship Between Coal Ash and Kiln Ringing: *Yong-bin Yang*¹; Yan Zhang¹; Qiang Zhong¹; Tao Jiang¹; Qian Li¹; Bin Xu¹; ¹Central South University

10:10 AM Break

10:30 AM

Improving the Pelletization of Chromite Concentrate by HPGR and Its Mechanism: Deqing Zhu¹; *Congcong Yang*¹; Jian Pan¹; Yang Zhong¹; ¹Central South University

10:50 AM

Influence of Sulfur on Dissolution of Graphite in Molten Iron: *Zhijia Zhang*¹; Jianliang Zhang¹; ¹University of Science and Technology Beijing

11:10 AM

Effect of MgO on Emergence of Blast Furnace Primary Slag with Comprehensive Furnace Burden: *Kaifa Zhang*¹; Shengli Wu¹; Wei Huang¹; Xinliang Liu¹; Juan Zhu¹; Kaiping Du¹; ¹University of Science and Technology Beijing

11:30 AM

Volatilization Behavior and Mechanisms of Arsenic, Sulfur, and Carbon in the Refractory Gold Concentrate: Hou Li-chen¹; Li Qian¹; Hu Jian-Jun¹; Yang Yong-Bin¹; Xu Bin¹; *Jiang Tao*¹; ¹Central South University

11:50 AM

Study on Enhanced Reduction of Liquid lead Slag with Coal Particles: Weifeng Li¹; *Jing Zhan*²; Chuanfu Zhang²; Gui LI¹; Jiann-yang Huang³; ¹Henan Yuguang Gold & Lead Co., Ltd.; ²Central South University; ³Michigan Technological University

Additive Manufacturing: Interrelationships of Fabrication, Constitutive Relationships Targeting Performance, and Feedback to Process Control — The Melt Pool and Cellular Foams

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; David Bourell, University of Texas at Austin; Reginald Hamilton, Pennsylvania State University; James Sears, GE Global Research Center; Allison Beese, Pennsylvania State University; Rajiv Mishra, University of North Texas

Tuesday AM March 17, 2015 Room: Northern Hemisphere A1 Location: Dolphin

Session Chairs: Brian Patterson, Los Alamos National Laboratory; Jack Beuth, Carnegie Mellon Univ

8:30 AM Invited

Aspects of the Process and Material Relationships in the Selective Laser Melting of Aluminium Alloys: *Christopher Tuck*¹; Ian Maskery¹; Marco Simonelli¹; Nesma Aboulkhair¹; Ian Ashcroft¹; Nicola Everitt; Nicola Everitt¹; Ricky Wildman¹; Richard Hague¹; ¹University of Nottingham

9:00 AM

Time-resolved In Situ Characterization of Laser-induced Rapid Solidification: *Joseph McKeown*¹; Kai Zweiacker²; Can Liu²; Aurelien Perron¹; Jean-Luc Fattebert¹; Patrice Turchi¹; Jörg Wiezorek²; Geoffrey Campbell¹; ¹Lawrence Livermore National Laboratory; ²University of Pittsburgh

9:20 AM Invited

Mapping of Ti64 Melt Pool Geometry and Microstructure Across All Direct Metal AM Processes: *Jack Beuth*¹; Jason Fox¹; Colt Montgomery¹; Zachary Francis¹; Daniel Christiansen¹; Sneha Narra¹; ¹Carnegie Mellon University

9:50 AM

A Sequential Minimum Energy Design Approach for Optimizing Process Parameters in Additive Manufacturing: *W. Young*¹; Brian Torries¹; Scott Thompson¹; Nima Shamsaei¹; Linkan Bian¹; ¹Mississippi State University

10:10 AM Break

10:30 AM

Micro CT Imaging of Metals and Polymers Made Through Additive Manufacturing: *Brian Patterson*¹; Mathew Robinson²; Kevin Henderson¹; Nikolaus Cordes¹; ¹Los Alamos National Laboratory; ²Atomic Weapons Establishment

10:50 AM

Variable-Density Cellular Structures: Additive Manufacturing, Constitutive Modeling, and Topology Optimization: *Pu Zhang*¹; Emre Biyikli¹; Jakub Toman¹; Yiqi Yu¹; Kevin Laux¹; Markus Chmielus¹; Albert To¹; ¹University of Pittsburgh

11:10 AM

Mechanical Characterization of Cellular Materials Manufactured Using 3D Printing: *Abhishek Kumar*¹; Nutan Singh²; ¹Aerospace Department; ²Bundelkhand Institute of Engineering & Technology

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms Micro-strain

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee Program Organizers: Rodney McCabe, Los Alamos National Laboratory; John Carpenter, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Khalid Hattar, Sandia National Laboratory; Irene Beyerlein, Los Alamos National Laboratory; Wolfgang Pantleon, Technical University of Denmark

Tuesday AM Room: Pelican 2 March 17, 2015

Location: Swan

Session Chairs: Matthew Barnett, Deakin University; Benjamin Morrow, Los Alamos National Laboratory

8:30 AM Invited

Characterization of Inhomogeneous Local Strain during Plastic Deformation in Aluminum Alloy: Masakazu Kobayashi1; Toshinobu Matsumoto¹; Aya Kouno¹; Hiromi Miura¹; Hiroyuki Toda²; ¹Toyohashi University of Technology; ²Kyushu University

9:00 AM

High Resolution Strain Measurement at Sub-Grain Scale of Nickel-Base Superalloy René 88DT: J.C. Stinville¹; F. Bridier²; P. Bocher³; T.M. Pollock1; 1University of California Santa Barbara; 2Department of Mechanical Engineering, École de Technologie Supérieure now at DCNS Reasearch; ³Department of Mechanical Engineering, École de Technologie Supérieure

9:20 AM

Study of Stress State Inside Twin and Parent Grains at Various Length Scales: Hamidreza Abdolvand¹; Angus Wilkinson²; Mark Daymond³; Jette Oddershede4; 1The University of Oxford; 2The University of Oxford; 3Queen's University; 4Technical University of Denmark

9:40 AM

Strain Measurement in HAZ during Arc Welding by Digital Image Correlation Method: Jian Chen¹; Xinghua Yu¹; Roger Miller¹; Zhili Feng¹; ¹Oak Ridge National Laboratory

10:00 AM Break

10:20 AM Invited

The Evolution of Deformation Patterning in Two FCC Metals with Different Stacking Fault Energies: Joao Fonseca1; 1The University of Manchester

10:50 AM

A Novel, High Resolution Approach for Concurrent Mapping of Mmicro-Strain and Micro-Structure Evolution up to Damage Nucleation: Cem Tasan¹; Dingshun Yan¹; Dierk Raabe¹; ¹Max-Planck Institute for Iron Research

11:10 AM

Role of Microstructure Evolution during High Strain-Rate Deformation of Tantalum: Shraddha Vachhani¹; Nathan Mara¹; Veronica Livescu¹; Ellen Cerreta1; 1Los Alamos National Laboratory

11:30 AM

A 3D Laue Micro-diffraction Study of Slip Band and Grain Boundary Interactions in Commercially Pure Titanium: Yi Guo1; Ben Britton2; Edmund Tarleton¹; David Collins¹; Angus Wilkinson¹; ¹University of Oxford; ²Imperial College

11:50 AM

Effect of Loading Boundary Conditions on Three-Dimensional Distribution of Local Stress, Strain and Misorientation Heterogeneity in a Ferritic Steel: Vahid Tari¹; Anthony Rollett²; Hossein Beladi³; Haitham ElKadiri4; 1Mississippi State University; 2Department of Materials Science and Engineering, Carnegie Mellon University; ³Institute for Frontier Materials, Deakin University; ⁴Mechanical Engineering Dept., Mississippi State University

Advanced Composites for Aerospace, Marine, and Land Applications II — Composite Microstructure and Mechanical Property Characterization

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Tomoko Sano, US Army Research Laboratory; Tirumalai Srivatsan, The University of Akron

Tuesday AM March 17, 2015

Room: Asia 5 Location: Dolphin

Session Chairs: Christopher Muhlstein, Georgia Institute of Technology; Paul Moy, Army Research Laboratory

8:30 AM Invited

Strain Field Mining: Identifying, Quantifying, and Validating "Hot Spots" in Free Surface Strain Fields: James Collins¹; Vincent Wu¹; Christopher Muhlstein1; 1Georgia Institute of Technology

8:50 AM

In-situ Microscopy for Both Qualitative and Quantitative Measurements in Single UHMWPE Fiber Tensile Experiments: Paul Moy¹; Brett Sanborn¹; Tusit Weerasooriya1; 1Army Research Laboratory

9:10 AM

Strain Field Mining: Predicting the Performance of Epoxy Bonded Joints from Free Surface Strain Field Metrics: James Collins¹; Christopher Muhlstein1; 1Georgia Institute of Technology

9:30 AM

Quasi-Static and Dynamic Nanoindentation Study of Local Mechanical Properties and Creep Effects of Carbonated Wollastonite Mineral System: Nannan Tian1; Warda Ashraf1; David Bahr1; 1Purdue University

9:50 AM

Prediction of Crack Initiation Site in Fastener Hole of Composite Laminate: Hossam El-Din Sallam¹; Amr Abd-Elhady¹; ¹Jazan University

10:10 AM Break

10:30 AM

Finite Element Analysis of Quantitative Percussion Diagnostics for Evaluating the Strength of Bonds Between Composite Laminates: Scott Poveromo1; James Earthman1; 1University of California, Irvine

10:50 AM

Characterization of Ti/Al Multilayered Composites Subjected to Perforation Testing: Derrick Stokes1; Stan Jones1; Viola Acoff1; 1The University of Alabama

11:10 AM

Oxidation Behavior Characterization of Zirconium Diboride Composites at Above 2000°: Ziyuan Zhou1; Xianghe Peng1; Zhen Wei1; 1College of Aerospace Engineering, Chongqing University

11:30 AM

Fiber/Matrix Reaction Kinetics in SiC/Ti-15-3 Composites: A. Muthuchamy1; G.D Janaki Ram1; V. Subramanya Sarma1; 1Indian Institute of Technology Madras

Advanced Materials and Reservoir Engineering for Extreme Oil & Gas Environments II — Nanocrystalline Materials and Novel Innovations for Oil and Gas Applications I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee *Program Organizers:* Indranil Roy, Schlumberger; Xinghang Zhang, Texas A&M University; Ting Chen, West Virginia University; Greg Kusinski, Chevron; Jefferson Rodrigues, Petrobras; Hani Elshahawi, Shell Exploration & Production, Co.

Tuesday AM	Room: Swan 7
March 17, 2015	Location: Swan

Session Chairs: Indranil Roy, Schlumberger; Terry Lowe, Colorado School of Mines

8:30 AM Keynote

Nanostructural Design of Ultrafine Grained Materials with Multifunctional

Properties: *Ruslan Valiev*¹; Maxim Murashkin²; Ilchat Sabirov³; ¹Ufa State Aviation Technical University, Saint Petersburg State University; ²Ufa State Aviation Technical University; ³IMDEA Materials Institute

8:55 AM Invited

Exceptional Functional Properties of Bulk Nanomaterials Processed by Severe Plastic Deformation Techniques: *Michael Zehetbauer*¹; ¹University of Vienna

9:20 AM Invited

Ultrafine-grain Metals by Severe Plastic Deformation for Tube Applications: *Laszlo Toth*¹; ¹Université de Lorraine

9:45 AM Invited

Surface Duplex Treatments of Steels: Characterization and Properties of the Modified Layers: *Thierry Grosdidier*¹; ¹Laboratoire d'Etude des Microstructures et de Mécanique des Matériaux (LEM3)

10:10 AM Break

10:25 AM Keynote

Simultaneous High Strength and Ductility Achieved via Distributed Nanoscale Domains in Elemental Metals: Evan Ma¹; ¹Johns Hopkins University

10:50 AM Invited

Nanostructured Materials and Design Innovations for Step Changes in Multi Stage Stimulation: *Gregoire Jacob*¹; Indranil Roy¹; Tony Collins¹; Rashmi Bhavsar¹; ¹Schlumberger

11:15 AM

Multifunctional Composites- Engineered Materials for Enhanced Completion and Stimulation Efficiencies: *Andrew Sherman*¹; Brian Doud¹; Nick Farkas¹; ¹Terves Inc

11:35 AM

Advanced High-Performance Composite Molding Systems for Oil & Gas Extreme HP/HT Applications: Yusheng Yuan¹; David Gerrard¹; Daniel Sequera¹; Christopher Campo¹; ¹Baker Hughes

11:55 AM

Novel Cement Composition for Sustaining Wellbore Integrity and Microstructural Characterization: Ruixuan Guo¹; ¹Louisiana State University

Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion III — Capacitors and Dielectric Materials I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee, TMS: Magnetic Materials Committee

Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael Lanagan, Penn State University; Michael McHenry, Carnegie Mellon University; Rachael Myers-Ward, Naval Research Laboratory; Clive Randall, Pennsylvania State University; Matthew Willard, Case Western Reserve University; Ty McNutt, APEI, Inc.

Tuesday AM March 17, 2015 Room: Asbury A Location: Yacht & Beach

Session Chair: Michael Lanagan, Pennsylvania State University

8:30 AM Invited

Recent Development of LTCC Technologies Designed for Nonconventional Applications: Yong Soo Cho¹; ¹Yonsei University

9:00 AM Invited

Carbon Microelectromechanical Systems (C-MEMS) Based Microsupercapacitors: Chunlei Wang¹; ¹Florida International University

9:30 AM Invited

Glass Capacitors for Power Electronics: *Mike Lanagan*¹; ¹Pennsylvania State University

10:00 AM Break

10:20 AM

Development of Predictive Tools for Self-Healing Behavior in Coated-Glass Systems: *Matthew Pyrz*¹; Michael Lanagan¹; ¹Pennsylvania State University

10:40 AM

Cubic Pyrochlore Bismuth Zinc Niobate Thin Films for Dielectric Energy Storage: *Elizabeth Michael*¹; Susan Trolier-McKinstry¹; ¹Pennsylvania State University

Advanced Materials in Dental and Orthopedic Applications — Session III

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Elizabeth Trillo, Southwest Research Institue; Grant Crawford, South Dakota School of Mines and Technology

Tuesday AM March 17, 2015 Room: Swan 8 Location: Swan

Funding support provided by: Magnetic, and Photonic Materials Division

Session Chairs: Grant Crawford, South Dakota School of Mines and Technology ; Terry Lowe, Colorado School of Mines; Tolou Shokuhfar, Michigan Technological University

8:30 AM Invited

Nanostructured Metals for Dental and Orthopedic Applications: *Ruslan Valiev*¹; Terry Lowe²; ¹Ufa State Aviation Technical University/Saint Petersburg State University; ²Colorado School of Mines

9:00 AM Invited

Processing, Microstructure Characterization and Biological Response of Cold Sprayed Biocomposite Coatings: *Eden Bhatta*¹; Grant Crawford¹; ¹South Dakota School of Mines and Technology

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9:30 AM

Surface Treatment of Ti-45Nb Open Porous Structures Towards Biomedical Applications: A Modified Approach: Ganna Yablokova1; Sasan Dadbakhsh1; Mathew Speirs1; Aliakbar Khangholi1; Jean-Pierre Kruth1; Jan Luyten¹; Jan Schrooten¹; Jan Humbeeck¹; ¹KU Leuven

9:50 AM

Strong Osseo-Integration in Dental and Orthopaedic Implants by Surface TiO2 Nanotubes: Sungho Jin1; 1University of California San Diego

10:10 AM Break

10:30 AM Invited

Nature of Inflammatory Response in Metal-on-Metal Surface Replacement Compared to Metal-on-Polyethylene Bearings with Corroded Modular Junctions: Deborah Hall¹; Robert Urban¹; Joshua Jacobs¹; ¹Rush Univerity Medical Center

11:00 AM

The Analysis of Mechanical and Electrical Property Effects of Bovine Bone Hydroxyapatite Composites Produced with the Addition of LiCO, on Biocompatibility: Sibel Daglilar1; Isil Kerti1; Murat Karagöz1; Fatih Dumludag¹; Faik Oktar¹; ¹Yildiz Technical University

11:20 AM

Tissue Response and Degradation Performance of a Novel Biodegradable Mg-Ca-Sr for Orthopedic Applications: Ida Berglund¹; Brittany Jacobs¹; Josephine Allen¹; Stanley Kim¹; Antonio Pozzi¹; Kyle Allen¹; Michele Manuel¹; 1University of Florida

11:40 AM

Influence of Testing Environment on the Degradation Behavior of Magnesium Alloys for Bioabsorbable Implants: Iñigo Marco Pelegrin1; Frank Feyerabend²; Regine Willumeit-Römer²; Omer van der Biest¹; ¹KU Leuven; ²Helmholtz-Zentrum Geesthacht

Advances in Solidification of Metallic Alloys under External Fields — Solidification under Magnetic Field

Sponsored by: TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS: Aluminum Committee, TMS: Solidification Committee Program Organizers: Jiawei Mi, University of Hull; Dmitry Eskin,

Brunel University

Tuesday AM March 17, 2015

Session Chairs: Patrick Grant, University of Oxford; Hideyuki Yasuda, Kyoto University

Room: Swan 1

Location: Swan

8:30 AM Introductory Comments

8:35 AM Invited

Influence of the Static Magnetic Field on Dendritic/Columnar Solidification, Observed by X-ray Imaging: Hideyuki Yasuda1; Keisuke Inoue²; Yudai Minami²; Tomoya Nagira²; Masato Yoshiya²; Kohei Morishita¹; Kantaro Uesugi3; 1Kyoto University; 2Osaka University; 3JASRI/SPring08

9:05 AM

A Comparative Study on Microstructure Refinement in Al3xxx and Al7xxx Alloys Solidified by the Electromagnetic Vibration Technique: Mingjun Li¹; Takuya Tamura¹; Naoki Omura¹; Yuichiro Murakami¹; Kenji Miwa¹; Shuji Tada¹; Koichi Takahashi²; ¹National Institute of Advanced Industrial Science and Technology, Materials Research Institute for Sustainable Development,; ²UACJ Corporation

9:25 AM

DC Casting of Magnesium Alloy AZ80 with Low-Voltage Pulsed Magnetic Field: Yuansheng Yang1; Tianjiao Luo1; Huanming Ji1; Xiaohui Feng1; Yingju Li1; 1Institute of Metal Research, Chinese Academy of Sciences

9:45 AM

Dispersion of Nanoparticles in Magnesium and Aluminum Alloys Using Magnetic Fields: Mariano Garrido Pacheco1; Valdis Bojarevics2; Yves Fautrelle1; Laurent Davoust1; 1SIMAP-EPM; 2Greenwich University

10:05 AM Break

10:20 AM

Refinement and Enhanced Growth of Al2Cu Dendrite during Magnetic Field Assisting Directional Solidification: Jiang Wang¹; Sheng Yue¹; Zhongming Ren²; Yves Fautrelle³; Yunbo Zhong²; Xi Li²; Peter Lee¹; ¹The University of Manchester; ²Shanghai University; ³SIMAP/EPM

10:40 AM

Effects of High Magnetic Fields on the Microstructures and Thermoelectric Properties of Zn-Sb Alloy: Yi Yuan1; Jun Mao2; Tie Liu2; Qiang Wang2; Masahiro Tahashi3; Jicheng He2; 1School of Materials and Metallurgy, Northeastern University; ²Key Laboratory of Electromagnetic Processing of Materials (Ministry Education), Northeastern University; 3Department of Electrical Engineering, Chubu University

11:00 AM

Application of Rotating Magnetic Field to Improve to Reinforcement Distribution, Electrical Conductivity and Mechanical Properties of Copper Matrix Composite: Tongmin Wang1; 1Dalian University of Technology

11:20 AM

The Effect of Static Magnetic Field on the Length of Mushy Zone of a Single-Crystal Nickel-Base Superalloy during Directional Solidification: Zhining Hu1; Weili Ren1; 1Shanghai University

11:40 AM

The Effect of Magnetic Field on the Morphology of γ ' Precipitates in DD483 Nickel-base Superalloy during Directional Solidification: Bin Liu¹; Weili Ren1; 1Shanghai University

Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu — Solidification Processing III

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Laurentiu Nastac, The University of Alabama; Baicheng Liu, Tsinghua University; Hasse Fredriksson, KTH - Royal Institute of Technology; Jacques Lacaze, Université de Toulouse; Chun-Pyo Hong, Yonsei University; Adrian Catalina, Caterpillar Inc.; Andreas Buhrig-Polaczek, RWTH Aachen University; Daan Maijer, The University of British Columbia; Charles Monroe, University of Alabama at Birmingham; Adrian Sabau, Oak Ridge National Laboratory; Roxana Ruxanda, Emerson Climate Technologies; Alan Luo, The Ohio State University; Subhayu Sen, GEOCENT; Attila Diószegi, Jönköping University, School of Engineering

Tuesday AM	Room: Swan 6
March 17, 2015	Location: Swan

Session Chair: Amber Genau, The University of Alabama at Birmingham

8:30 AM Invited

Use of AC Magnetic Fields for Flow Control in Solidifying Metallic Alloys: Dirk Räbiger¹; Tobias Vogt¹; Sven Eckert¹; ¹Helmholtz Zentrum Dresden-Rossendorf

8:55 AM

Dynamic Stability of Three-Phased Eutectic Patterns during Thin-Sample Directional Solidification: Sinan Yücetürk¹; Melis Serefoglu¹; S. Bottin-Rousseau²; S. Akamatsu²; G. Faivre²; ¹Koc University; ²INSP, UPMC, CNRS

9:15 AM

A Coupled Thermo-Mechanical Simulation on Squeeze Casting Solidification Process of Three-Dimensional Geometrically Complex Components: Jie Tang¹; Zhiqiang Han¹; Jue Sun²; Shanxin Xu²; ¹Tsinghua University; ²Suzhou Sanji Foundry Equipment Co., Ltd.

9:35 AM

Effects of Transition Element Additions on the Oxidation of 2L99 Alloy: *Elizabeth Hinton*¹; William Griffiths¹; ¹University of Birmingham

9:55 AM

Double Oxide Film Defects in Al Castings and the Effect of Different Element Additions: *Qi Chen*¹; Adrian Caden¹; William Griffiths¹; ¹University of Birmingham

10:15 AM Break

10:35 AM Invited

The Design of New Submerged Entry Nozzles for Beam-Blank Continuous Casting: *Miaoyong Zhu*¹; Mianguang Xu¹; Sen Lou¹; ¹Northeastern University

11:00 AM

Eutectic Solidification: From Multicomponent Alloys to the Macroscale: O. Senninger¹; A.V. Catalina²; *Peter Voorhees*¹; ¹Northwestern University; ²Caterpillar Inc.

11:20 AM

Effects of Ce on the Thermal Stability of the Ω Phase in a Cast Aluminum Metal Matrix Composite: *Federico Melotti*¹; William Griffiths¹; Terry Hirst²; Alan Dustan³; ¹University of Birmingham; ²Controls and Data Services; ³Aeromet International PLC

Advances in Thin Films for Electronics and Photonics — Functional Materials for Electronics and Photonics I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee

Program Organizers: Federico Rosei, INRS; Nuggehalli Ravindra, New Jersey Institute of Technology; Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Terry Alford, Arizona State University

Tuesday AM	Room: Europe 7
March 17, 2015	Location: Dolphin

Session Chair: Ravindra Nuggehalli, NJIT

8:30 AM Invited

3D Orientation Imaging in the Transmission Electron Microscope: *Søren Schmidt*¹; Peter Larsen¹; Jakob Schøitz¹; Xiaoxu Huang¹; ¹Technical University of Denmark

9:00 AM Invited

Photophysical and Morphological Characteristics of Luminescent Compounds-Dopes Peptide Nanostructures Systems: *Tatiana Martins*¹; ¹Federal University of Goias

9:30 AM Invited

Polynitrogen Cluster Films for Fuel Cell Catalysis: Zafar Iqbal¹; ¹New Jersey Institute of Technology

10:00 AM Break

10:20 AM Invited

Role of Complex Energy Landscapes and Strains in Multiscale Inhomogeneities in Perovskite Manganites: *Keun Hyuk Ahn*¹; Tsezar F. Seman²; Turab Lookman³; A. R. Bishop³; ¹New Jersey Institute of Technology; ²Nothern Illinois University and Argonne National Laboratory; ³Los Alamos National Laboratory

10:45 AM Invited

Role of Electric Field, Defects and Radiation Damage in Determining Reliability in AlGaN/GaN High Electron Mobility Transistors: *Steve Pearton*¹; Fan Ren¹; ¹Univ.Florida

11:10 AM Invited

Symbiotic Bimetallic Nanoparticles: Synthesis and Properties: *Abhinav Malasi*¹; Jingxuan Ge¹; Ritesh Sachan²; Anup Gangopadhyay³; Hernando Garcia⁴; Gerd Duscher²; Ramki Kalyanaraman¹; ¹University of Tennessee, Knoxville; ²University of Tennessee Knoxville, ORNL Oak Ridge; ³Washington University, St. Louis; ⁴Southern Illinois University Edwardsville

11:35 AM Invited

Use of Two Photon Polymerization to Create Functional Structures for Biomedical Applications: *Roger Narayan*¹; ¹UNC/NCSU Joint Department of Biomedical Engineering

Alloys and Compounds for Thermoelectric and Solar Cell Applications III — Session III

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Stéphane Gorsse, Bordeaux INP; Chih-Huang Lai, National Tsing Hua University; Yoshisato Kimura, Tokyo Institute of Technology; Ce-Wen Nan, Tsinghua University; G. Jeffrey Snyder, California Institute of Technology; Hsin-jay Wu, National Sun Yat-Sen University

Tuesday AM March 17, 2015 Room: Europe 5 Location: Dolphin

Session Chairs: Terry Tritt, Clemson University; Takao Mori, National Institute for Materials Science

8:30 AM Invited

Hybrid Effect to Possibly Overcome the Trade-Off between Seebeck Coefficient and Electrical Conductivity: *Takao Mori*¹; ¹National Institute for Materials Science (NIMS)

8:55 AM

Transport Properties of ABX Type Thermoelectric Alloys: *Haoxing Yang*¹; Ramana Reddy¹; ¹The University of Alabama

9:15 AM

Effects of Electrical Stressing on Microstructure and Thermoelectric Properties of Bismuth Telluride Compounds: *Yao-Hsiang Chen*¹; Chien-Neng Liao¹; Hsu-Shen Chu²; ¹National Tsing Hua University; ²Industrial Technology Research Institute

9:35 AM Invited

Boosted Thermoelectric Performance of Half-Heusler Compound via Carrier Engineering and Nanostructuring Approaches: *Wenjie Xie*¹; Anke Weidenkaff¹; Terry Tritt²; ¹University of Stuttgart; ²Clemson University

10:00 AM Break

10:20 AM

Structures and Thermoelectric Properties of Double-Filled Skutterudites: Lan Li¹; Izaak Williamson¹; ¹Boise State University

10:40 AM

Phase Equilibria Isoplethal Section at 40at%Bi of the Bi-Te-Se-In System: *Po-Han Lin*¹; Sinn-Wen Chen¹; ¹National Tsing Hua University

11:00 AM

Flexural Behavior of p-Type Half-Heusler Thermoelectric Material: *Sonika Gahlawai*¹; Ran He¹; Shuo Chen¹; Zhifeng Ren¹; Ken White¹; ¹University of Houston

Alumina and Bauxite — Digestion

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Hans-Werner Schmidt, Outotec GmbH

Tuesday AM March 17, 2015 Room: Southern Hemisphere IV Location: Dolphin

Session Chair: Andrey Panov, RUSAL

8:30 AM Introductory Comments

8:35 AM

A Novel Self-stirring Tubular Reactor Used in Bauxite Digestion Process: Zhang Zimu¹; Zhao Qiuyue¹; Zhang Dianhua¹; *Zhang Ting 'an*¹; Liu Yan¹; Lv Guozhi¹; Dou Zhihe¹; Zhang Changdong¹; ¹Northeastern University

9:00 AM

Research on Digestion Behavior of Sulfur in High-Sulfur Bauxite: *Zhanwei Liu*¹; Wangxing Li²; Wenhui Ma¹; Zhonglin Yin²; Guobao Wu²; ¹Faculty of Metallurgical and Energy Engineering, Kunming University of Science and Technology; ²Zhengzhou Research Institute of CHALCO

9:25 AM

The Impact of Sulphate and Carbonate on the Performance of Siliconate-Type Polymers as Inhibitor of Scaling: Vladimir Kazakov¹; *Vadim Lipin*¹; ¹Saint Petersburg State Polytechnical University

9:50 AM

Fuzzy Technology Application in a Bauxite Digestion Unit: *Thiago Franco*¹; Roberto Seno¹; Anderson Duck¹; Igor Santiago²; Leonardo Freitas²; ¹CBA/ Votorantim Metais; ²I.Systems

10:15 AM Break

10:30 AM

Research of the Mineral Fouling Composition and Removal Method in Bauxite Digestion Process: *Cao Wenzhong*¹; Dongdong Wang¹; Weiwei Tian¹; Hong Zhong¹; ¹Nanchang University

10:55 AM

Synergistic Effect of $C_{12}A_7$ and CA on Alumina Leaching Property of Calcium Aluminate Clinker: *Bo Wang*¹; Jiajia Liu¹; Huilan Sun¹; Yubing Zhang¹; Dongdong Liu¹; ¹Hebei University of Science and Technology

11:20 AM Question and Answer Period

11:45 AM Concluding Comments

Aluminum Alloys: Development, Characterization, and Applications — Development and Applications

Sponsored by: TMS Light Metals Division, TMS: Aluminum Processing Committee

Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix,LLC; Tongguang Zhai, University of Kentucky

Tuesday AMRoom: Northern Hemisphere E3March 17, 2015Location: Dolphin

Session Chair: Zhengdong (Steven) Long, Kaiser Aluminum

8:30 AM

Process Development for Stamping A-Pillar Covers with Aluminum: Jung-Pyung Choi¹; *Aashish Rohatgi*¹; Mark Smith¹; Curt Lavender¹; ¹Pacific Northwest National Laboratory

8:50 AM

Development of the Next Generation of Aluminum Alloys for Packaging: *Gyan Jha*¹; ¹MetalCure LLC

9:10 AM

Innovative and Sustainable Development of Aluminum Alloys for Transportation: *Gyan Jha*¹; ¹MetalCure LLC

9:30 AM

Development of an Accelerated Ageing Test on an Al-Si-Cu-Mg Alloy for Aeronautics: *Lisa Grosset*¹; Christophe Desrayaud¹; Anna Fraczkiewicz¹; Cédric Bosch¹; Lucie Anssems²; Samuel Becquerelle²; Baptiste Guerin²; ¹Ecole Nationale Supérieure des Mines de Saint-Etienne; ²Hispano-Suiza (SAFRAN)

9:50 AM

Mechanical and Thermal Properties of Rheocast Telecom Component Using Low Silicon Aluminium Alloy In As-Cast and Heat-Treated Conditions: *Mostafa Payandeh*¹; Emma Sjölander¹; Anders Jarfors¹; Magnus Wessen¹; ¹Jönköping University

10:10 AM Break

10:20 AM

Aluminum High Pressure Vacuum Die Casting Applications for the Multi Materials Lightweight Vehicle (MMLV) Program Body Structure: *Randy Beals*¹; Jeff Conklin¹; Tim Skszek²; David Wagner³; Matt Zaluzec³; ¹Cosma; ²Magna Intl Inc.; ³Ford Motor Co.

10:40 AM

Warm Forming of AA7075-T6 with Direct Electrical Resistance Heating: *Thomas Ivanoff*¹; Eric Taleff¹; Louis Hector²; ¹University of Texas at Austin; ²General Motors

11:00 AM

Influence of Heat Treatment Parameters on the Metallurgical Quality of EN AW 7068 Extruded Bars: *Mario Rosso*¹; ¹Politecnico di Torino

11:20 AM

Scrap-Intensive Wrought Aluminum Alloys of Standard Quality: *Varužan Kevorkijan*¹; Peter Cvahte²; Branko Hmelak³; Sara Hmelak³; Vukašin Dragojevic²; Marina Jelen²; Marjana Lažeta²; Uroš Kovacec²; ¹Impol R in R d.o.o.; ²Impol Aluminium Industry; ³Alcad d.o.o.

11:40 AM

Simultaneously Increasing the Strength and Ductility of Cold-Worked 2024 Aluminum Alloy: *Zhiqing Yang*¹; ¹Institute of Metal Research

Aluminum Processing — Session II

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: John Griffin, ACT LLC

Tuesday AM	Room: Southern Hemisphere I
March 17, 2015	Location: Dolphin

Session Chair: Kiran Manchiraju, Southwire Company

8:30 AM

Strain Analysis during Symmetric and Asymmetric Rolling of AA 7075 Al Alloy Sheets: *Cunqiang Ma*¹; Longgang Hou¹; Jishan Zhang¹; Linzhong Zhuang¹; ¹University of Science and Technology, Beijing

8:55 AM

Results in Production of an Improved Grain Refinement Practise for 6xxx Extrusion Billets: *John Courtenay*¹; Marcel Rosefort²; Rein Vainik¹; ¹MQP Limited; ²Trimet Aluminium SE

9:20 AM

Structural Studies on the Evolution of Texture in Heavily Wire Drawn and Subsequently Annealed Pure Al Metal: Mohammad Shamsuzzoha¹; ¹University of Alabama

9:45 AM Break

10:00 AM

Use of Vaporizing Foil Actuator for Impact Welding of Aluminum Alloy Sheets with Steel and Magnesium Alloys: *Anupam Vivek*¹; Bert Liu¹; Glenn Daehn¹; ¹Ohio State University

10:25 AM

Microstructure Evolution of AA3003 Aluminum Alloys Enhanced by Zirconium Addition Studied by Electron Microscopy: Michaela Poková¹; Miroslav Cieslar¹; Mariia Zimina¹; ¹Charles University in Prague, Faculty of Mathematics and Physics

10:50 AM

Theoretical and Experimental Studies of a Thermal Regenerator for Heat Recovery in Aluminum Melting Furnaces: Seyed Mojtaba Sadrameli¹; Hamid Ajdari²; ¹TMU; ²Ferdowsi University

Aluminum Reduction Technology — Environment I

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pascal Lavoie, LMRC

Tuesday AMRoom: Southern Hemisphere IIIMarch 17, 2015Location: Dolphin

Session Chair: Eric Phillips, Noranda Aluminum

8:30 AM Introductory Comments

8:35 AM

Use of the Life Cycle Assessment Methodology to Support Sustainable Aluminum Production and Technology Developments: *Guillaume Girault*¹; Stéphane Petit¹; Jean-Philippe Rheault¹; David Mercereau²; Benoît Verzat³; ¹Rio Tinto Alcan; ²ENEA Consulting; ³Quantis

9:00 AM

Comparative Analysis of the Environmental Impacts of Aluminum Smelting Technologies: Viktória Kovács¹; László Kiss²; ¹Budapest University of Technology and Economics; ²Université du Québec à Chicoutimi

9:25 AM

Anode Effect Reduction at Nordural – Practical Points: Andri Thorhallsson¹; ¹Nordural - Grundartangi

9:50 AM Break

10:05 AM

Studies on Background PFC Emission in Hall-Héroult Reduction Cells using Online Anode Current Signals: *Ali Jassim*¹; Akhemtov Sergey¹; Barry Welch²; Maria S. Kazacos³; Yuchen Yao³; Jie Bao³; ¹DUBAL; ²Welbank Consulting Ltd; ³University of New South Wales

10:30 AM

Non Anode Effect PFCs: Measurement Considerations and Potential Impacts: *Neal Dando*¹; Nick Menegazzo¹; Nathan Westendorf¹; Luis Espinoza-Nava¹; Eliezer Batista¹; ¹Alcoa

Aluminum Reduction Technology — Fundamentals Chemistry

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pascal Lavoie, LMRC

Tuesday AMRoom: Southern Hemisphere VMarch 17, 2015Location: Dolphin

Session Chair: Xiangwen Wang, Alcoa, Inc.

8:30 AM Introductory Comments

8:35 AM

Effect of Operational Parameters on the Behavior of Phosphorous and Sulfur in Aluminum Reduction: *Rauan Meirbekova*¹; Geir Haarberg²; Jomar Thonstad²; Donald Ziegler³; Julius Brynjarsson⁴; Gudrun Saevarsdottir¹; ¹Reykjavik University; ²Norwegian University of Science and Technology; ³Alcoa Technical Center; ⁴Alcoa Fjarðaál

9:00 AM

Chemical Characterization and Thermodynamic Investigation of Anode Crust Used in Aluminum Electrolysis Cells: *Francois Allard*¹; Martin Désilets¹; Marc LeBreux¹; Alexandre Blais²; ¹Université de Sherbrooke; ²Rio Tinto Alcan

9:25 AM

Non-Intrusive Freeze Layer Detection Method in an Aluminum Reduction Cell: *Laszlo Kiss*¹; Adam Ugron¹; Sebastien Guerard²; Jean-Francois Bilodeau²; ¹Universite du Quebec a Chicoutimi; ²Rio Tinto Alcan

9:50 AM

Monitoring Local Alumina Dissolution in Aluminum Reduction Cells Using State Estimation: Yuchen Yao¹; Cheuk-Yi Cheung¹; Jie Bao¹; Maria Skyllas-Kazacos¹; ¹University of New South Wales

10:15 AM Break

10:30 AM

Study on the Dissolution of Alumina in Cryolite Electrolyte Using the See-Through Cell: *Youjian Yang*¹; Bingliang Gao¹; Zhaowen Wang¹; Zhongning Shi¹; Xianwei Hu¹; ¹Northeastern University

10:55 AM

Production of Al-Sc alloy by Electrolysis of Cryolite-Scandium Oxide Melts: Yuriy Shtefanyuk¹; V. Mann¹; V. *Pingin*²; D. Vinogradov²; Yu. Zaikov³; O. Tkacheva³; ¹UC RUSAL; ²LLC RUSAL ETC; ³Ural University of Hight Temperature

Biological Materials Science Symposium — Biomimetic Systems I

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Kalpana Katti, North Dakota State University; Rajendra Kasinath, DePuy Synthes Products, LLC; Michael Porter, Clemson University; Francois Barthelat, McGill University

Tuesday AM March 17, 2015 Room: Swan 9 Location: Swan

Session Chairs: Francois Barthelat, McGill University; Kalpana Katti, North Dakota State University

8:30 AM

Adhesion of Anodic Titanium Dioxide Coatings on Titanium Grades 5 Alloys: Maria Vera¹; Mario Rosenberger¹; *Carlos Schvezov*¹; Alicia Ares¹; ¹IMAM (CONICET-UNaM)

8:50 AM

Bio-inspired Synthesis of Ceramic Scaffolds by a Novel Sol-Gel/Freeze Casting Hybrid Method: *Haw-Kai Chang*¹; Po-Yu Chen¹; ¹National Tsing Hua University

9:10 AM

Bone Mimetic Nanoclay Testbed for Prostate Cancer: *Kalpana Katti*¹; Shahajahan Molla¹; Dinesh Katti¹; ¹North Dakota State University

9:30 AM

Bone Growth Behavior of Hydroxyapatite-Coated TiO₂ Nanotubes: *Jirapon Khamwannah*¹; Gary Johnston¹; Sungho Jin¹; ¹Materials Science and Engineering, University of California San Diego

9:50 AM

Creating Multi-Layered Collagen-Hydroxyapatite Composites Using Biomimetic Processing to Emulate Bone's Mechanical Properties: Brian Wingender¹; Patrick Bradley²; Jeff Ruberti²; Laurie Gower¹; ¹University of Florida; ²Northeastern University

10:10 AM Break

10:20 AM

Bioinspired Protection from the Armored Carapace of the Boxfish: *Steven Naleway*¹; Wen Yang¹; Michael Porter¹; Marc Meyers¹; Joanna McKittrick¹; ¹University of California San Diego

10:40 AM

Dentin Remineralization using Anionic Process-Directing Agents and Phosphate-Containing Small Molecules: *Neha Saxena*¹; Manuel Esparragoza¹; Stefan Habelitz²; Grayson Marshall²; Laurie Gower¹; ¹University of Florida; ²University of California San Fransisco

11:00 AM

Interfacial Adhesion between Polymer and Osteoconductive Minerals: Faezeh Shalchy¹; Sina Youssefian¹; Pingsheng Liu²; Jie Song²; *Nima Rahbar*¹; ¹Worcester Polytechnic Institute; ²UMass Medical School

11:20 AM

Laser Induced Diffusion in Metallic Implants for Reduced Heating in MRI Environments: *Thiwanka Wickramasooriya*¹; Ashwani Kaul¹; Aravinda Kar¹; Raj Vaidyanathan¹; ¹University of Central Florida

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TUESDAY AM

Bulk Metallic Glasses XII — Structures and Mechanical Properties I

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Hahn Choo, Univ of Tennessee; Yanfei Gao, University of Tennessee

Tuesday AM March 17, 2015 Room: Asia 4 Location: Dolphin

Session Chairs: Takeshi Egami, University of Tennessee; Michael Atzmon, University of Michigan

8:30 AM Keynote

Structure and Properties of Shear-Transformation-Zone: Takeshi Egami¹; Yue Fan²; Takuya Iwashita¹; Wojciech Dmowski¹; ¹University of Tennessee; ²Oak Ridge National Laboratory

9:00 AM Invited

Atomistic Interpretation of the Dynamic-Mechanical Behavior of Metallic Glasses: JongDoo Ju¹; *Michael Atzmon*¹; ¹University of Michigan

9:25 AM

Fine Tuning the Microstructure and Mechanical Properties of a ZrCuNiAl Bulk Metallic Glass by Electropulsing: *Yongjiang Huang*¹; Hongbo Fan¹; Shisong Guan¹; Dongjun Wang; Jianfei Sun¹; Jun Shen¹; ¹Harbin Institute of Technology

9:45 AM Invited

High Pressure, High Temperature Structural Study of Zr-Based Glasses: Wojciech Dmowski¹; Stanislaw Gierlotka²; Yoshihiko Yokoyama³; Takeshi Egami⁴; ¹University of Tennessee; ²Polish Academy of Sciences; ³Tohoku University; ⁴Oak RIdge National Laboratory

10:10 AM Break

10:25 AM Invited

In-Situ TEM Tensile Experiments on Metallic Glasses: Challenges and Opportunities: *Jeff De Hosson*¹; ¹Univ of Groningen

10:45 AM

Micro-Mechanical Behavior of Fe Based Bulk Metallic Glass: *Thien Phan*¹; Olivia Graeve²; James Kelly²; Andrea Hodge¹; Michael Kassner¹; ¹University of Southern California; ²UCSD

11:05 AM Invited

Relation between Mechanical Relaxations and Plasticity in Bulk Metallic Glasses: Jean-Marc Pelletier¹; Jichao Qiao; Sandrine Cardinal¹; ¹INSA-Lyon

11:25 AM Invited

Structure Evolution and Hot Hardness of Co-Fe-Zr-B-Cu Magnetic Material: *Song Lan*¹; Matthew Willard¹; John Lewandowski¹; ¹Case Western Reserve University

11:45 AM Invited

Deformation in Ni-Nb Metallic Glassy Film: Jianzhong Jiang¹; ¹Zhejiang University

CALPHAD-Based ICME Research for Materials Genomic Design — Materials Genome: ICME and CALPHAD-Based Materials Design 2

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Wei Xiong, Northwestern University; Shihkang Lin, National Cheng Kung University; Chao Jiang, Thermo-Calc Software Inc; Shenyang Hu, Pacific Northwest National Laboratory; Wen-dung Hsu, National Cheng Kung University; Sinn-wen Chen, National Tsinghua University; Shuanglin Chen, CompuTherm LLC

Tuesday AM March 17, 2015 Room: Northern Hemisphere A2 Location: Dolphin

Session Chairs: Eric Lass, NIST; Shuanglin Chen, CompuTherm LLC; Chao Jiang, Thermo-Calc Software Inc; Shengyang Hu, Pacific Northwest National Laboratory

8:30 AM Keynote

CALPHAD Modeling and Materials Genome®: *Zi-Kui Liu*¹; ¹The Pennsylvania State University

9:00 AM Keynote

High Performance Aluminum Foundry Alloy Development Based on ICME Approach: Xinyan Yan¹; Jen Lin¹; ¹Alcoa

9:30 AM

Investigate Mechanical Properties of Multi-Component Solid Solution Alloy Using First Principles Methods: *Lizhi Ouyang*¹; ¹Tennessee State University

9:50 AM Break

10:05 AM

Thermodynamic Investigation on the LSM Perovskite Thermal Cycle Shrinkage: Ali Karbasi¹; Shadi Darvish¹; Maria Mora¹; *Yu Zhong*¹; ¹Florida International University

10:25 AM Keynote

The Materials Genome Initiative, CALPHAD and the Data Problem: *Carelyn Campbell*¹; Ursula Kattner¹; Alden Dima¹; ¹National Institute of Standards and Technology

10:55 AM Invited

Materials Design by the CALPHAD Modeling Tool in the Framework of ICME: *Fan Zhang*¹; Weisheng Cao¹; Shuanglin Chen¹; Chuan Zhang¹; Jun Zhu¹; ¹CompuTherm, LLC

11:20 AM

Competitive Stabilities of D8m, D88, D8l Structures in Ternary T-X-X' Ternary Systems: *jean claude Tedenac*¹; Catherine Colinet²; ¹University Montpellier; ²Science et Ingénierie des Matériaux et Procédés, UMR 5266

11:40 AM

Simulation of Precipitation of Nitrides in CrMnN Steels: Karin Frisk¹; ¹Swerea KIMAB

TUESDAY AM

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Cast Shop for Aluminum Production — Furnaces and Energy Efficiency

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pete Forakis, STAS Middle East

Tuesday AMRoom: Northern Hemisphere E4March 17, 2015Location: Dolphin

Session Chairs: Mark Jolly, Cranfield University; Cynthia Belt, Consultant

8:30 AM Introductory Comments

8:35 AM

Developing a Do-It-Yourself Excel Model of a Reverberatory Side-Well Aluminum Melting Furnace: Art Morris¹; ¹Thermart Software

9:00 AM

Numerical Modeling of Heat Transfer in a Full Scale Industry Furnace: *Jørgen Furu*¹; Andreas Buchholz¹; ¹Hydro Aluminium

9:25 AM

Rotary Flux Injector: (RFI) Recent Development towards an Autonomous Technology: *André Larouche*¹; Francis Breton¹; Peter Waite¹; Pascal Côté²; Simon Claveau²; ¹Rio Tinto Alcan; ²STAS

9:50 AM

Truths and Falsehoods of Molten Metal Explosions in the Aluminium Industry: Alex Lowery¹; ¹WISE CHEM LLC

10:15 AM Break

10:30 AM

Calculated Aluminum Oxidation Rates During Rotary Furnace Melting Through Flue Gas Analysis: Stewart Jepson¹; ¹Air Liquide

10:55 AM

CFD Comparison of Immersed Heater and Open Fire Burner Designs for Casting Furnaces: *Mohamed Hassan*¹; Ayoola Brimmo¹; ¹Masdar Institute of Science and Technology

Characterization of Materials through High Resolution Coherent Imaging — Phase Contrast Imaging

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Ross Harder, Argonne National Lab; Richard Sandberg, Los Alamos National Laboratory; Brian Abbey, La Trobe University; Xianghui Xiao, Argonne National Laboratory; John Carpenter, Los Alamos National Laboratory

Tuesday AM	Room: Macaw 2
March 17, 2015	Location: Swan

Session Chair: Ross Harder, Argonne National Laboratory

8:30 AM

Phase Contrast In-situ X-ray Tomographic Imaging for Materials Science: Brian Patterson¹; Kevin Henderson¹; Nikolaus Cordes; Amy Clarke; Paul Gibbs; Seth Imhoff; Virginia Manner¹; Xianghui Xiao; Tyler Stannard²; James Williams²; Sudhanshu Shekhar Singh; Angel Ovejero²; Nikhilesh Chawla; ¹Los Alamos National Laboratory; ²Arizona State University

9:00 AM Invited

In Situ Investigation of Dynamic Material Response Using Synchrotronbased Propagation Phase Contrast Imaging: *Kyle Ramos*¹; Brian Jensen¹; Adam Iverson²; David Montgomgery¹; Richard Sandberg¹; John Barber¹; Kamel Fezzaa³; ¹Los Alamos National Laboratory; ²National Security Technologies; ³Argonne National Laboratory, Advanced Photon Source

9:20 AM

Soft-X-ray Holographic Imaging of Magnetic Nanostructures: *Bastian Pfau*¹; Christian Günther²; Thomas Hauet³; Stefan Eisebitt²; Olav Hellwig⁴; ¹Lund University; ²Technical University Berlin; ³Université de Lorraine; ⁴HGST a Western Digital Company

9:40 AM

In Situ Investigation of Stress Corrosion Cracking of Aluminum Alloys by X-ray Synchrotron Tomography: Sudhanshu Singh¹; Tyler Stannard¹; Jason Williams¹; Xianghui Xiao²; *Nikhilesh Chawla*¹; ¹Arizona State University; ²Advanced Photon Source, Argonne National Laboratory

10:00 AM Break

10:20 AM Invited

Fast X-ray Tomography Applications in Material Sciences with Phase-Contrast Imaging: Xianghui Xiao¹; ¹Argonne National Laboratory

10:40 AM

Integrated Solution for Quantification of Filamentous Material in 3D Imaging: *Ming Lei*¹; Patrick Barthelemy¹; ¹FEI

11:00 AM Invited

Holography Using an Arbitrary Reference Wave: Adrian D'Alfonso¹; Andrew Martin¹; Andrew Morgan²; Peng Wang³; Hidetaka Sawada⁴; Angus Kirkland⁵; Leslie Allen¹; ¹University of Melbourne; ²DESY; ³Nanjing University; ⁴JEOL Ltd; ⁵University of Oxford

11:20 AM

Ultrafast Imaging of Shocked Material Dynamics with X-ray Fee Electron Laser Pulses: *Richard Sandberg*¹; Cindy Bolme¹; Kyle Ramos¹; Virginia Hamilton¹; Tim Pierce¹; John Barber¹; Brian Abbey²; Andreas Schropp³; Frank Seiboth³; Phil Heiman⁴; Bob Nagler⁴; Eric Galtier⁴; Eduardo Granados⁴; ¹Los Alamos National Laboratory; ²La Trobe University; ³Technische Universitat Dresden; ⁴SLAC National Accelerator Laboratory

Characterization of Minerals, Metals, and Materials — Method Development in Characterization

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chenguang Bai, Chongqing University; Juan Pablo Escobedo, University of New South Wales; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Neves Monteiro, Military Institute of Engineering, IME, Materials Science Department; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal; Jian Li, CanmetMATERIALS

Tuesday AM March 17, 2015 Room: Mockingbird 1 Location: Swan

Session Chairs: John Carpenter, Los Alamos National Laboratory; Jian Li, CanmetMATERIALS

8:30 AM

Advanced FIBApplications in Materials Research at CanmetMATERIALS: Jian Li¹; P. Liu¹; R. Zhang¹; J. Lo¹; ¹CanmetMATERIALS

8:50 AM

Coupling the Digital Image Correlation and Finite Element Methods for Determining Flow Behavior Beyond Uniform Elongation: Daniel Gerbig¹; Allan Bower¹; Vesna Savic²; Louis Hector²; ¹Brown University; ²General Motors

9:10 AM

Cyclic Hardness Test PHYBAL-CHT – A New Short-Time Procedure to Estimate Fatigue Properties of Metallic Materials: *Marcus Klein*¹; Hendrik Hramer¹; Dietmar Eifler¹; ¹TU Kaiserslautern

www.tms.org/TMS2015

9:30 AM

9:10 AM

Study of Metallic Calibrated Defects by Subsurface Nanoscale Imaging: *Pauline Vitry*¹; Laurène Tétard²; Eric Bourillot¹; Cédric Plassard¹; Yvon Lacroute¹; Eric Lesniewska¹; ¹University of Bourgogne; ²University of Central Florida

9:50 AM

Effective Measurement of Elastic Constants from Polycrystalline Samples: *Xinpeng Du*¹; Peng Zhao¹; Ji-Cheng Zhao¹; ¹The Ohio State University

10:10 AM Break

10:20 AM

Interface-Driven Plasticity: The Presence of an Interface Affected Zone in Metallic Lamellar Composites: *John Carpenter*¹; Rodney McCabe¹; Jason Mayeur¹; Nathan Mara¹; Irene Beyerlein¹; ¹Los Alamos National Laboratory

10:40 AM

Investigation of Strain Transfer Across Grain Boundaries in Commercially Pure Tantalum: *Bret Dunlap*¹; Philip Eisenlohr¹; Claudio Zambaldi²; David Mercier²; Yang Su¹; Thomas Bieler¹; Martin Crimp¹; ¹Michigan State University; ²Max-Planck-Institut für Eisenforschung

11:00 AM

Innovative Procedure for the Characterisation of Thermo-mechanical Properties Of Carbon Base Materials Using The Gleeble® 3800 System: *Dany Racine*¹; Dmitry Lukovnikov¹; Daniel Marceau¹; Denis Laroche²; ¹University Research Centre on Aluminium (CURAL) - Aluminium Research Centre (REGAL) - University of Québec at Chicoutimi; ²Rio Tinto Alcan (Arvida Research and Development Center)

11:20 AM

Solid Solution Characterization in Metal by Original Tomographic Scanning Microwave Microscopy Technique: *Eric Bourillot*¹; Pauline Vitry¹; Virgil Optasanu¹; Tony Montessin¹; Eric Lesniewska¹; ¹University of Bourgogne

11:40 AM

Real Space Measurement of Lattice Misfit with Scanning Transmission Electron Microscopy: Adedapo Oni¹; Xiahan Sang¹; Santoshrupa Dumpala²; Selva Raju³; Aakash Kumar⁴; Srikant Srinivasan²; Scott Broderick²; Surendra Saxena³; Susan Sinnott⁴; Krishan Rajan²; James LeBeau¹; ¹North Carolina State University; ²Iowa State University; ³Florida International University; ⁴University of Florida

Computational Modeling and Stochastic Methods for Materials Discovery and Properties — Stochastic, Statistic, and Multiscale Methods

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Dallas Trinkle, University of Illinois at Urbana-Champaign; Mikhail Mendelev, Ames Laboratory; Adri van Duin, Pennsylvania State University

Tuesday AM	Room: Northern Hemisphere A4
March 17, 2015	Location: Dolphin

Session Chair: Adri van Duin, Pennsylvania State University

8:30 AM

Atoms-to-Continuum Simulation of the Rapid Solidification of Metallic Liquids: *Howard Sheng*¹; ¹GMU

8:50 AM

Computer Simulation of Martensite Spread: A Stochastic Approach: *Paulo Rios*¹; Filipi Cardoso¹; Matheus Nogueira¹; Tiago Neves¹; José Roberto Guimarães¹; ¹UFF-EEIMVR Grain Network Representation of Microstructure: Predicting Rare Microstructural Events: *Brian DeCost*¹; Elizabeth Holm¹; ¹Carnegie Mellon University

9:30 AM

Kinetic Monte Carlo Enabled Modeling of Diffusion Assisted Plastic Deformation: James Martino¹; Srinath Chakravarthy¹; ¹Northeastern University

9:50 AM Break

$10{:}05\,\mathrm{AM}$

Modeling Chemical Fluctuations Across Stacking Faults in L12-Containing Co-base Superalloys Using Cluster-Assisted Statistical Mechanics: *Michael Titus*¹; Robert Rhein¹; Philip Dodge¹; Alessandro Mottura¹; Anton Van der Ven¹; Tresa Pollock¹; ¹University of California, Santa Barbara

10:25 AM

Modeling Stress Corrosion Cracking in Metals and Alloys: *Tahir Cagin*¹; Hieu Pham¹; Richard Gustafson¹; ¹Texas A&M University

10:45 AM

Obtaining a Bimodal Grain Size Distribution via Thermal Treatment for Property Optimization: *David Wu*¹; Hao Yuan Tay¹; Muhammad Huzaifah¹; Siu Sin Quek¹; ¹Institute of High Performance Computing, A*STAR

11:05 AM

Parameter Estimation in Mechanistic Tool Wear Model: A Bayesian Approach: Farbod Akhavan Niaki¹; Durul Ulutan¹; Laine Mears¹; ¹Clemson University

11:25 AM

Thermally-Activated Non-Schmid Glide of Screw Dislocations in W Using Atomistically-Informed Kinetic Monte Carlo Simulations: Alexander Stukowski¹; David Cereceda²; Thomas Swinburne³; *Jaime Marian*²; ¹Darmstadt University of Technology; ²University of California Los Angeles; ³Imperial College

Computational Thermodynamics and Kinetics — Grain Boundary and Grain Growth

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Maryam Ghazisaeidi, The Ohio-State University; Vidvuds Ozolins, University of California Los Angeles

Tuesday AM March 17, 2015 Room: Oceanic 3 Location: Dolphin

Session Chair: Dallas Trinkle, University of Illinois, Urbana-Champaign

8:30 AM

Atomistic Modeling of Pre-Melted Grain Boundaries: J. Hickman¹; Y. Mishin¹; ¹George Mason University

8:50 AM

Atomistic Simulations of Grain Boundary Mobilities in the Iron-Helium System: *Tegar Wicaksono*¹; Chad Sinclair¹; Matthias Militzer¹; ¹The University of British Columbia

9:10 AM

Computational Study of the Stiffness of Asymmetric Tilt Boundaries in a Model Bcc Binary Alloy: *Isaac Toda-Caraballo*¹; Paul Bristowe¹; ¹University of Cambridge

9:30 AM Invited

Grand-Canonical Thermodynamics of Grain Boundaries: *Danny Perez*¹; Thomas Vogel¹; Blas Uberuaga¹; ¹Los Alamos National Laboratory
10:00 AM Break

10:15 AM

Mechanisms of Thermally Damped Grain Boundary Motion, and Its Role in Low Temperature Abnormal Grain Growth: *Jonathan Humberson*¹; Elizabeth Holm¹; ¹Carnegie Mellon University

10:35 AM

Shear Accommodation in Dirty Grain Boundaries: *Moneesh Upmanyu*¹; Changjian Wang¹; ¹Northeastern University

10:55 AM

Hydrogen Segregation to Vicinal Twin Boundaries in Nickel: *Christopher O'Brien*¹; Stephen Foiles¹; Richard Karnesky¹; ¹Sandia National Laboratories

11:15 AM

Investigation of Grain Boundary Triple Junction Energetics in Face Centered Cubic Materials: *Ilaksh Adlakha*¹; Kiran Solanki¹; ¹Arizona State University

11:35 AM

Influences of Solute Segregation on Grain Boundary Motion: Hao Sun¹; *Chuang Deng*¹; ¹University of Manitoba

Constitutive Response and Modeling of Structural Materials: An SMD Symposium in Honor of G.T. Gray III's 60th Birthday — Dynamic Damage Evolution and Defect Storage

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Neil Bourne, University of Manchester; Eric Brown, Los Alamos National Laboratory; James Williams, Ohio State University; Kenneth Vecchio, University of California- San Diego

Tuesday AM	Room: Asia 2
March 17, 2015	Location: Dolphin

Session Chairs: Jim Williams, Ohio State University; Carl Cady, Los Alamos National Laboratory

8:30 AM Invited

Damage Development Induced by Femtosecond Laser Pulses: Michael Titus; McLean Echlin; *Tresa Pollock*¹; ¹University of California Santa Barbara

8:50 AM

The Role of Pulse Length and Amplitude on Incipient Damage in Ductile Failure: *Neil Bourne*¹; Sam McDonald¹; Philip Withers¹; G.T. Gray²; ¹ISchool of Materials, University of Manchester, Manchester M13 9PL, UK.; ²Los Alamos National Laboratory

9:10 AM Invited

Simulation of Fragmentation Process in Expanding Ring Test of OFHC Copper Using Continuum Damage Mechanics: *Nicola Bonora*¹; Andrew Ruggiero¹; Gianluca Iannitti²; ¹University of Cassino; ²TECHDYN Engineering

9:30 AM

When Do Interfaces Become Important for Failure? Saryu Fensin¹; Ellen Cerreta¹; G.T. Gray¹; ¹Los Alamos National Laboratory

9:50 AM Invited

Effects of Microstructure on the Dynamic Tensile Spall Behavior of Al 5083: Ricky Whelchel¹; Naresh Thadhani¹; ¹Georgia Institute of Technology

10:10 AM Break

10:30 AM

Biaxial Deformation and Damage Initiation in Aluminum: *Veronica Livescu*¹; John Bingert²; Cheng Liu¹; Manuel Lovato¹; Brian Patterson¹; Ellen Cerreta¹; ¹Los Alamos National Laboratory; ²OUSD(AT&L)/TWS/LW&M

10:50 AM Invited

Pressure Effects on Flow and Fracture of Structural Materials: John Lewandowski¹; ¹Case Western Reserve University

11:10 AM

Laser Shock-Induced Spalling in Tantalum: Tane Remington¹; ¹University of California San Diego

11:30 AM Invited

Defect-Defect Interactions in Shock Loaded Materials: Voids and Bubbles at Copper Grain Boundaries: *Steven Valone*¹; Saryu Fensin¹; Ellen Cerreta¹; G.T. Gray¹; Richard Hoagland¹; ¹Los Alamos National Laboratory

11:50 AM Invited

Damage Evolution in HT-9 and its Relation to Second Phase Precipitation: *Stuart Maloy*¹; Osman Anderoglu¹; Eda Aydogan¹; Sara Perez-Bergquist²; ¹Los Alamos National Laboratory; ²University of Tennessee

12:10 PM

Spall Behaviour of Aluminium at Three Different Crystalline Orientations: *Gareth Owen*¹; David Chapman²; Steven Johnson²; Glenn Whiteman¹; Jeremy Millett¹; ¹AWE; ²Imperial College

12:30 PM Invited

Localized Shear and Damage Evolution at High Strain Rates: *Carl Cady*¹; G.T. Gray¹; Ellen Cerreta¹; Curt Bronkhorst¹; ¹Los Alamos National Laboratory

Development of "Weak Links" during the Processing of Metallic Materials — Microstructure Evolution

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Lee Semiatin, US Air Force Research Laboratory; Anthony Rollett, Carnegie Mellon University; Thomas Bieler, Michigan State University; Mark Stoudt, National Institute of Standards and Technology

Tuesday AM March 17, 2015 Room: Peacock Location: Swan

Session Chairs: David Furrer, Pratt & Whitney; Anthony Rollett, Carnegie Mellon University

8:30 AM Invited

Effects of Clustered Nucleation in Partially Recrystallized Samples on Ductility: *Dorte Jensen*¹; ¹DTU

9:00 AM Invited

Prevention of Coarse Microstructure Features during Conversion of Ingot Metallurgy Nickel- and Titanium-Based Alloys: *J.P. Thomas*¹; S. L. Semiatin²; ¹ATI Specialty Materials; ²Air Force Research Laboratory AFRL/ RXCM

9:30 AM Invited

Abnormal Grain Growth during Supersolvus Heat Treatment of PM Superalloys: *Eric Huron*¹; David Mourer¹; Ken Bain¹; Joseph Heaney¹; Arturo Acosta¹; Timothy Hanlon¹; ¹GE Aviation

10:00 AM Break

10:15 AM Invited

Grain Size Distribution Evolution during Thermomechanical Processing of Powder Metallurgical Superalloys: *Eric Payton*¹; ¹Alfred University

10:45 AM

Effect of Zr Addition on Recrystallization Behavior in Rolled Ti-Zr Alloys: *Tomoyuki Homma*¹; Yusuke Matayoshi¹; ¹Nagaoka University of Technology

11:05 AM

Effect of Microstructure Nonuniformity on Hot Rolling of TiAl Foil: *Lee Semiatin*¹; Fred Meisenkothen²; ¹US Air Force Research Laboratory; ²National Institute of Standards and Technology

11:25 AM

Thermal Stability of FeZr Nanocomposites Containing Nanolaminates: *Zhe Fan*¹; Xinghang Zhang¹; Haiyan Wang¹; ¹Texas A&M University

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Dynamic Probing of Microstructure Evolution in Nanostructured Materials — Interface Mediated Deformation Mechanism

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee Program Organizers: Nan Li, Los Alamos National Laboratory; Caizhi Zhou, Missouri University of Science and Technology; Dan Gianola, University of Pennsylvania; Marc Legros, CEMES-CNRS

Tuesday AM March 17, 2015 Room: Mockingbird 2 Location: Swan

Session Chairs: Caizhi Zhou, Missouri University of Science and Technology; Siddhartha Pathak, Los Alamos National Laboratory

8:30 AM Invited

Deformation Mechanisms in Nanocrystalline Metals: Influence of Grain Boundary Topology and Loading Conditions: Aruna Prakash¹; Benoit Merle¹; *Erik Bitzek*¹; ¹Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

9:00 AM

Indentation-Induced Grain Growth and Deformation in Nanocrystalline Nickel: *Garritt Tucker*¹; Stephen Foiles²; ¹Drexel University; ²Sandia National Laboratories

9:20 AM Invited

A Mesoscale Model of Plasticity: Dislocation Patterns, Size and Stochastic Effects: Hussien Zbib¹; Nasrin Taheri-Nassaj¹; ¹Washignton State University

9:50 AM

Mapping Grains and Interface Networks in Atomistic Simulations: Tracking Dynamic Nanocrystalline Microstructures: Jason Panzarino¹; Timothy Rupert¹; ¹University of California Irvine

10:10 AM Break

10:30 AM Invited

Determining the Strength of Individual Phases within Nanolayered Composites: *Peter Anderson*¹; Michael Gram¹; Andrew Payzant²; ¹The Ohio State University; ²Oak Ridge National Laboratory

11:00 AM Invited

Exploring the Role of Interfaces in Metal-Ceramics Composites from Atomic to Continuum Scales: *Jian Wang*¹; Shuai Shao¹; Caizhi Zhou²; Amit Misra³; ¹Los Alamos National Laboratory; ²Missouri S&T; ³University of Michigan

11:30 AM

Lattice Dislocation Nucleation from Nodes of the (111) Semi-Coherent Interfaces: *Shuai Shao*¹; Jian Wang¹; Irene Beyerlein¹; ¹Los Alamos National Laboratory

11:50 AM

Deformability of UltaHigh Strength Metal-Ceramic Cu/TiN Nanolayered Composites: *Siddhartha Pathak*¹; Nan Li¹; Richard Hoagland¹; Jon Baldwin¹; Jian Wang¹; Amit Misra²; Nathan Mara¹; ¹Los Alamos National Laboratory; ²University of Michigan

Electrode Technology for Aluminum Production – Anode Forming and Baking

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Arne Ratvik, SINTEF

Tuesday AM March 17, 2015 Room: Southern Hemisphere II Location: Dolphin

Session Chair: Angelique Adams, Alcoa

8:30 AM Introductory Comments

8:35 AM

A Dynamic Process Model for Predicting the Performance of Horizontal Anode Baking Furnaces: *Noura Oumarou*¹; Yasar Kocaefe¹; Duygu Kocaefe¹; Brigitte Morais²; Jacques Lafrance²; ¹University of Quebec at Chicoutimi (UQAC); ²AAL

9:00 AM

Environmental and Operating Benefits of a New Fume Treatment System at a Restarted Anode Plant: Matthias Hagen¹; Bernd Schricker¹; Peter Deinlein¹; ¹LTB

9:25 AM

Successful Start-up of Firing Control System at Vlissingen: *Nicolas Fiot*¹; Pierre Mahieu¹; Bart Van Garsel²; Fabienne Virieux³; ¹Solios Carbone; ²Century Aluminium; ³Fives Solios

9:50 AM

Quality Control via Electrical Resistivity Measurement of Industrial Anodes: *Yasar Kocaefe*¹; Duygu Kocaefe¹; Dipankar Bhattacharyay¹; ¹University of Quebec at Chicoutimi

10:15 AM Break

10:30 AM

Xelios Vibrocompactors: A Step Towards Sustainability: *Vincent Philippaux*¹; Jean-François Andre¹; Bertrand Somnard¹; Fabienne Virieux²; ¹Solios Carbone; ²Fives Solios

10:55 AM

Baking Furnace Rebuild Strategy at Dubal to Improve Productivity: Tapan Sahu; *Amer Al Marzouqi*¹; Saleh Rabba¹; Pragasan Palavar¹; Galappaththi Priyantha¹; Thaseen Aiyaz¹; ¹Dubal

11:20 AM

Description and Applications of a 3D Mathematical Model for Horizontal Anode Baking Furnaces: *Mounir Baiteche*¹; Duygu Kocaefe¹; Yasar Kocaefe¹; Daniel Marceau¹; Brigitte Morais²; Jacques Lafrance²; ¹University of Québec at Chicoutimi; ²Aluminerie Alouette Inc.

Energy Technologies and Carbon Dioxide Management Symposium 2015 — Carbon Management

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee

Program Organizers: Animesh Jha, University of Leeds; Brajendra Mishra, Colorado School of Mines; Eric Peterson, Idaho National Lab; Cong Wang, Northeastern University; Neale Neelameggham, Ind LLC; Donna Guillen, Idaho National Lab; Li Li, Cornell University

luesday AM	Room: Grand Harbor Salon 4
March 17, 2015	Location: Yacht & Beach

Session Chairs: Animesh Jha, University of Leeds; Cynthia Belt, Consultant

8:30 AM

A Thermodynamic Study of Gasification Mixed Carbon Feedstock Slags: Jinichiro Nakano¹; Marc Duchesne²; Xueyan Song³; James Bennett¹; Kyei-Sing Kwong¹; Anna Nakano¹; ¹US Department of Energy National Energy Technology Laboratory; ²Natural Resources Canada CanmetENERGY; ³West Virginia University

8:50 AM

Carbon Dioxide Reforing of Coke Oven Gas: A Comparison Investigation of LaNiO₃ Perovskite Catalysts Supported on Several Common High Surface Area Carries: *Qiuhua Zhu*¹; Xionggang Lu¹; Hongwei Cheng¹; Changyuan Lu¹; Xingli Zou; Guangshi Li¹; ¹Shanghai University

9:10 AM

CO₂ Reforming of Hydrocarbon Gaseous Feedstock for Synthesis Gas Production: Alexei M. Essiptchouk¹; *Gilberto Petraconi*¹; ¹Instituto Tecnológico de Aeronáutica

9:30 AM

Effect of Additives on Sulfur Retention and Combustion Behavior of Pulverized Coal during Combustion Process: *Qin Yuelin*¹; Guangjun Zhu¹; Yanhua Yang¹; Qianying Zhang¹; Nengyun Deng¹; ¹Chongqing University of Science and Technology

9:50 AM Invited

Manipulating the Electronic Structure and Catalytic Activity of Au Nanomaterials for CO₂ Conversion Applications: Christopher Matranga¹; ¹US DOE- NETL

10:10 AM Break

10:30 AM

Evaluation of Heat Treatment Performance of Potential Pipe Steels in CCS-Environment: Anja Pfennig¹; ¹HTW Berlin

10:50 AM

The Preparation of a New Biodiesel Antioxidant and Kinetic Analysis: Li She¹; ¹Kunming University of Science and Technology

11:10 AM

Economic Assessment of Methanol Synthesis by Co2 from Coal-Fired Power Plants: *Yudong Wang*¹; Yongnian Dai¹; ¹Kunming University of Science and Technology

11:30 AM

Thermal Wastes from Energy Conversions and Global Anthropogenic Warming: *Neale Neelameggham*¹; Brian Davis²; Robert Brown³; Ian Howard-Smith⁴; ¹Ind LLC; ²Brian Davis Associates Consulting; ³Magnesium Assistance Group; ⁴Teks

Fatigue in Materials: Fundamentals, Multiscale Modeling, Life Prediction and Prevention — General Session

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Antonios Kontsos, Drexel University

Tuesday AM	Room: Oceanic 4
March 17, 2015	Location: Dolphin

Session Chairs: Tongguang Zhai, University of Kentucky; Antonios Kontsos, Drexel University

8:30 AM

Investigation of Fully-Reversed Low-Cycle Fatigue Behavior in a Wrought Magnesium Alloy by Real-time in-situ Neutron Diffraction: *Wei Wu*¹; Peter Liaw²; Ke An¹; ¹Oak Ridge National Laboratory; ²University of Tennessee

8:55 AM

Fatigue Behavior of Aluminum-Magnesium-Silicon Alloy (AA6061) Processed by Equal Channel Angular Pressing: *P.Siva Sai Kishore*¹; Uday Chakkingal¹; S.Ganesh Sundara Raman¹; ¹Indian Institute of Technolgy, Madras

9:15 AM

A Crystal Plasticity Description of Cyclic Fatigue in an Mg Alloy Bi-Crystal: Simon Knight¹; Brad Diak¹; Mark Daymond¹; ¹Queen's University

9:35 AM

Hysteresis Prediction under Thermomechanical Fatigue with Dwells: Thomas Bouchenor¹; Ali Gordon¹; ¹University of Central Florida

9:55 AM

Real-Time In Situ Neutron Diffraction Study of the Hardening Mechanism of A 304L Stainless Steel under Strain Cycling: *Dunji Yu*¹; Ke An²; Yan Chen²; Xu Chen¹; ¹Tianjin University; ²Oak Ridge National Laboratory

10:15 AM Break

10:35 AM

Real Time Damage Detection: A Novel Use of Triboluminescent Materials: *William Hollerman*¹; Ross Fontenot¹; ¹University of Louisiana at Lafayette

10:55 AM

Effect of High Altitude (Low Temperature and Water Vapor Pressure) Environments on Fatigue Crack Propagation Rates in Aerospace Aluminum Alloys: *Jennifer Jones*¹; James Burns¹; ¹University of Virginia

11:15 AM

Quantifying Surface Roughness Evolution under Cyclic Loads in FCC Metals through Discrete Dislocation Dynamics Simulations: Ahmed Hussein¹; Jaafar Elawady¹; ¹Johns Hopkins University

11:35 AM

Cyclic Behavior and Microstructure-Property Relation of Semi-Crystalline Polymers: Jutima Simsiriwong¹; Nima Shamsaei¹; ¹Mississippi State University

Fatigue in Materials: Fundamentals, Multiscale Modeling, Life Prediction and Prevention — Microstructure Effects on Fatigue Properties

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Antonios Kontsos, Drexel University

Tuesday AM March 17, 2015 Room: Australia 3 Location: Dolphin

Session Chairs: Antonios Kontsos, Drexel University; Tongguang Zhai, University of Kentucky

8:30 AM Keynote

Length-Scale Effects on Fatigue of Metal Structures: *Oliver Kraft*¹; Charlotte Ensslen¹; Reiner Mönig¹; ¹Karlsruhe Institute of Technology

9:05 AM

Modeling of the 3D Effects of Particles on Fatigue Crack Initiation in High Strength Al Alloys: *Pei Cai*¹; Yan Jin¹; Tongguang Zhai¹; ¹University of Kentucky

9:25 AM Invited

Damage Behavior at Twin and Grain Boundary in Alloy 690 Material in the Very High Cycle Fatigue Regime: *Guocai Chai*¹; ¹Sandvik Materials Technology

9:45 AM

Simulating the Effect of Inclusions on Microstructure-Sensitive HCF/ VHCF Life Scatter of Notched Components: *William Musinski*¹; David McDowell²; ¹US Air Force Research Lab; ²Georgia Institute of Technology

10:05 AM Break

10:20 AM

Threshold Values for Crack Initiation by FGA-Formation at Non-Metallic Inclusions in the Very High Cycle Fatigue Regime of High Strength Steels: Daniel Spriestersbach¹; Patrick Grad¹; Eberhard Kerscher¹; ¹TU Kaiserslautern

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10:40 AM Invited

Controllable Fatigue Cracking Mechanisms of Copper Bicrystals with a Coherent Twin Boundary: *Linlin Li*¹; Zhenjun Zhang¹; Peng Zhang¹; Zhefeng Zhang¹; ¹Institute of Metal Research, Chinese Academy of Science

11:00 AM

Crack Tip Dislocations under Static and Cyclic Loading: Ramasis Goswami¹; Syed Qadri¹; Chandra Pande¹; ¹Naval Research Laboratory

11:20 AM

Microstructure-Based Probabilistic Modeling of Small Fatigue Crack Growth Behavior in a Ni-Base Superalloy: Sushant Jha¹; Patrick Golden²; Reji John²; James Larsen²; ¹Air Force Research Laboratory/Universal Technology Corporation; ²US Air Force Research Laboratory

11:40 AM

Multiscale Investigation of Dislocation Annihilation during Fatigue in Metals and Alloys: *Hao Wang*¹; Dongsheng Xu¹; Rui Yang¹; ¹Institute of Metal Research, Chinese Academy of Sciences

Friction Stir Welding and Processing VIII — Aluminum and Magnesium Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Rajiv Mishra, University of North Texas; Murray Mahoney, retired from Rockwell Scientific; Yutaka Sato, Tohoku University; Yuri Hovanski, Pacific Northwest National Laboratory

Tuesday AM	Room: Northern Hemisphere A3
March 17, 2015	Location: Dolphin

Session Chairs: John Baumann, The Boeing Company; Z.Y. Ma, Institute of Metal Research, Chinese Academy of Sciences

8:30 AM Keynote

Experiences with FSW of Traditional and Advanced Aerospace Aluminium Alloys in the Airbus Group: Juergen Silvanus¹; ¹Airbus Group

9:10 AM Invited

FSW of High Strength 7XXX aluminum Using Four Process Variants: Xiaomin Huang¹; Jason Scheuring²; *Anthony Reynolds*¹; ¹University of South Carolina; ²Kaiser Aluminum

9:30 AM Invited

FSW of Aluminum Tailor Welded Blanks Across Machine Platforms: *Yuri Hovanski*¹; Piyush Upadhyay¹; Blair Carlson²; Robert Szymanski²; Tom Luzanski³; Dustin Marshall³; ¹Pacific Northwest National Laboratory; ²General Motors; ³TWB Company

9:50 AM

The Effect of Friction Stir Welding on the Mechanical Properties on Al 2139-T8: Uchechi Okeke¹; Tomoko Sano²; Jian Yu²; Chian-Fong Yen²; *Carl Boehlert*¹; ¹Michigan State University; ²US Army Research Lab

10:10 AM Break

10:30 AM

Characterization of a Friction Stir Weld in Aluminum Alloy 7055 Using Microhardness and Differential Scanning Calorimetry (DSC): *Ralph Bush*¹; Michelle Kiyota²; Catherine Kiyota²; ¹US Air Force; ²USAFA

10:50 AM Invited

Natural Aging in Friction Stir Welded 7136-T76 Aluminum Alloy: Izabela Kalemba¹; *Carter Hamilton*²; Stanislaw Dymek¹; ¹AGH University of Science and Technology; ²Miami University

11:10 AM

Aluminum Tailor Welded Blanks – Preparing for High Volume Production: *Yuri Hovanski*¹; John Carsley²; Blair Carlson²; Susan Hartfield-Wunsch²; Mark Eisenmenger³; Brandon Landino⁴; ¹Pacific Northwest National Laboratory; ²General Motors Research & Development; ³TWB Company; ⁴Alcoa

11:30 AM

Study on the Microstructure and Tensile Properties of FSPed 7075 Al Alloy after Aging Treatment: *Ming-Hsiang Ku*¹; Fei-Yi Hung¹; Truan-Sheng Lui¹; Li-Hui Chen¹; ¹National Cheng Kung University

11:50 AM

The Effect of Heat Treatment on the Properties of Friction Stir Processed AA7075-O With and Without Nano Alumina Additions: Mohamed Refat¹; *Mohamed Ahmed*²; Abdel Rahman Abdelmotagaly²; Iman El Mahallawi³; ¹The British University in Egypt; ²Suez University; ³Cairo University

Frustrated Ferroic Materials — General Principles and Commonalities

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Michael Manley, Oak Ridge National Laboratory; Raymundo Arroyave, Texas A & M University; Navdeep Singh, University of Houston

Tuesday AM	Room: Europe 1
March 17, 2015	Location: Dolphin

Session Chairs: Xiaobin Ren, National Institute for Materials Science; Peter Entel, TU Duisburg-Essen

8:30 AM Invited

Mesoscopic Modeling of Ferroic and Multiferroic Glasses: Avadh Saxena¹; Teresa Castan²; Antoni Planes²; ¹Los Alamos National Laboratory; ²University of Barcelona

9:00 AM

Displacive Phase Transition Precursor Phenomena: Theory, Computation, and Experiment: *Yu Wang*¹; Yongmei Jin¹; Yang Ren²; ¹Michigan Technological University; ²Argonne National Laboratory

9:20 AM Invited

Co-Doped NiMnGa Ferromagnetic Shape Memory Alloys: A Magnetic and Structural Playground: *Franca Albertini*¹; Simone Fabbrici²; Giacomo Porcari³; Massimo Solzi³; Peter Entel⁴; Lara Righi⁵; ¹IMEM-CNR; ²MIST E-R; ³Dipartimento di Fisica e Scienze della Terra, Università di Parma; ⁴Faculty of Physics and CENIDE, University of Duisburg-Essen; ⁵Dipartimento di Chimica

9:50 AM Break

10:10 AM Invited

Multiple Ferroic Glasses via Ordering in a Single Material Composition: James Monroe¹; Jeffery Raymond¹; Xiao Xu²; Ryosuke Kainuma²; Yuri Chumlyakov³; Raymundo Arroyave; Ibrahim Karaman; ¹Texas A&M University; ²Tohoku University; ³Siberian Physical Technical Institute

10:40 AM

Unique Properties of Ferroic Nanodomains: Dong Wang¹; Xiaobing Ren²; *Yunzhi Wang*³; ¹Xi'an Jiao Tong University; ²NIMS; ³Ohio State University

11:00 AM Invited

Ferromagnetic Strain Glass Phenomenon in Ni-Mn-Ga Based Alloy Systems: Yu Wang¹; Xiaoping Song¹; Xiaobing Ren²; ¹MOE Key Laboratory for Nonequilibrium Synthesis and Modulation of Condensed Matter, Xi'an Jiaotong University; ²National Institute for Materials Science

11:30 AM Invited

Relaxor Ferroelectrics, Spin-Glass and Real Glass: *Takeshi Egami*¹; ¹University of Tennessee

Fundamental Methods for Integrating Microstructure-Property-Design Relationships into the ICME Paradigm — Mechanics and Multi-Scale Modeling

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee *Program Organizers:* Christopher Woodward, Air Force Research Laboratory; Somnath Ghosh, Johns Hopkins University

Tuesday AM March 17, 2015 Room: Oceanic 2 Location: Dolphin

Session Chairs: Dennis Dimiduk, Retired Air Force Research Lab; Somnath Ghosh, Johns Hopkins University

8:30 AM Invited

Addressing Some Issues in Computational Mechanics of Materials for Modeling Metals and Composites: An ICME Initiative: Somnath Ghosh¹; ¹Johns Hopkins University

9:00 AM

Homogenization-Based Modeling of Coupled Crystal Plasticity and Ductile Damage Evolution at High Strain Rates: Coleman Alleman¹; Somnath Ghosh¹; ¹Johns Hopkins University

9:20 AM

A Continuum Dislocation Dynamics Approach to Crystal Plasticity of Two-Phase Titanium Alloys: *Hector Basoalto*¹; Jeffery Brooks¹; ¹University of Birmingham

9:40 AM

A Multi-Scale Method for Predicting the Influence of Microstructure on Forming Limit Diagrams for Advanced High Strength Steels: Ankit Srivastava¹; H. Sung¹; H.G. Armaki¹; S. Kumar¹; A.F. Bower¹; L. Zhang²; J. Min³; F. Abu Farha⁴; J. Carsley⁵; L.G. Hector Jr.⁵; ¹School of Engineering, Brown University; ²School of Mechanical Engineering, Tongji University; ³Mechanical Engineering Dept., University of Michigan; ⁴Clemson University - International Center for Automotive Research; ⁵General Motors R&D Center

10:00 AM Break

10:20 AM Invited

High-temperature Discrete Dislocation Plasticity: Amine Benzerga¹; Shyam Keralavarma; ¹Texas A&M University

10:50 AM

Statistical Analysis of Failure in Polymer Matrix Composites: Masoud Safdari¹; Nancy Sottos¹; Philippe Geubelle¹; ¹University of Illinois

11:10 AM

ICME for Crashworthiness of TWIP Steels: From Ab Initio to the Crash Performance: Onur Güvenc¹; Markus Bambach¹; Gerhard Hirt¹; ¹IBF -RWTH-Aachen

11:30 AM

Micro and Meso-Scale Strength Modeling of Cast Aluminum Alloys: Shibayan Roy¹; Adrian Sabau¹; G. Muralidharan¹; Dongwon Shin¹; Lawrence Allard¹; Amit Shyam¹; ¹Oak Ridge National Laboratory

11:50 AM

Concurrent Atomistic Continuum Simulation of Brittle-to-Ductile Transitions in Single Crystal Solids Using Adaptive Mesh Refinement: *Shuozhi Xu*¹; Rui Che²; Liming Xiong³; David McDowell¹; Youping Chen²; ¹Georgia Institute of Technology; ²University of Florida; ³Iowa State University

High-Entropy Alloys III — Alloy Development and Applications

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Michael Gao, National Energy Technology Lab; Suveen Mathaudhu, University of California Riverside

Tuesday AM March 17, 2015 Room: Oceanic 5 Location: Dolphin

Session Chairs: Peter Liaw, The University of Tennessee; Suveen Mathaudhu, University of California Riverside

8:30 AM

A Low-Density, Single-Phase High Entropy Alloy Produced by Mechanical Alloying: *Alexander Zaddach*¹; Khaled Youssef²; Changning Niu¹; Douglas Irving¹; Carl Koch¹; ¹North Carolina State University; ²Qatar University

8:50 AM Invited

Accelerated Exploration of Multi-Principal Element Alloys with Solid Solution Phases: *Oleg Senkov*¹; Jonathan Miller¹; Daniel Miracle¹; Christopher Woodward¹; ¹Air Force Research Laboratory, Materials and Manufacturing Directorate

9:10 AM Invited

Designing High Entropy Alloys Using an Optimization Heuristic: *Ganesh Balasubramanian*¹; ¹Iowa State University

9:30 AM Invited

A Critical Review of High Entropy Alloys: Dan Miracle¹; Oleg Senkov¹; ¹AF Research Laboratory

9:50 AM Invited

Irradiation Resistance of High-Entropy Alloys: *Takeshi Egami*¹; Takeshi Nagase²; Wei Guo¹; Phillip Rack¹; ¹University of Tennessee; ²Osaka University

10:10 AM Break

10:25 AM Invited

Multiphase Multicomponent Alloys with Simple Structures: C. Cline¹; Abraham Munitz¹; R.D. Field¹; *Michael Kaufman*¹; ¹Colorado School of Mines

10:45 AM Invited

Phase Formation Rules and Serrated Flow in High Entropy Multicomponent Alloys: *Yong Zhang*¹; ¹University of Science and Technology Beijing

11:05 AM

Ultrastrong and Thermally Stable Multi-component Alloys at Small Scales: Yu Zou¹; Huan Ma¹; Ralph Spolenak¹; ¹ETH Zurich

11:25 AM Invited

High-Entropy Alloys in Hexagonal Closed Packed Structure: Michael Gao¹; Jeff Hawk¹; ¹National Energy Technology Lab

11:45 AM Invited

High-Throughput Synthesis and Characterization of Thin Film High Entropy Alloys Based on the Fe-Ni-Co-Cu-Ga System: Samuel Guérin¹; Anaïs Guyomarc'h¹; Brian Hayden¹; Jean-Philippe Soulié¹; Sergey Yakvolev¹; James Cotton²; ¹Ilika Technologies; ²The Boeing Company

High-Performance Aerospace Alloys Design Using ICME Approach — Session III

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee *Program Organizers*: Awadh Pandey, Pratt & Whitney; Somnath Ghosh, Johns Hopkins University; Dongsheng Li, Pratt & Whitney

Tuesday AMRoom: Oceanic 6March 17, 2015Location: Dolphin

Session Chair: Somnath Ghosh, Johns Hopkins University

8:30 AM Invited

Aerospace Alloys by Design: From CALPHAD to Flight: Greg Olson¹; ¹Northwestern University

9:00 AM Invited

Microstructure Quantification and Analysis for ICME of High Temperature Alloys: *Mark Tschopp*¹; ¹U.S. Army Research Laboratory

9:30 AM

Grain Boundary Engineering of Powder Processed Ni-base Superalloy RR1000: Martin Detrois¹; Sammy Tin¹; ¹Illinois Institute of Technology

9:50 AM Break

10:10 AM Invited

Strategies for Multiscale Materials Simulations Using Calibrated Metamodels: Surya Kalidindi¹; Yuksel Yabansu¹; ¹Georgia Institute of Technology

10:40 AM

Ni-based Superalloy Micro-lattice Structures: *Dinc Erdeniz*¹; Tobias Schaedler²; Zhou Lu¹; Alan Jacobsen²; William Carter²; David Dunand¹; ¹Northwestern University; ²HRL Laboratories, LLC

11:00 AM

Simulation of Gamma-Prime Precipitation Kinetics in Commercial Ni-Base Superalloys: *Michael Fahrmann*¹; David Metzler¹; ¹Haynes International Inc.

High-Temperature Electrochemistry II — Sensors and Advanced Materials

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee *Program Organizers:* Prabhat Tripathy, Idaho National Laboratory; Guy Fredrickson, Idaho National Lab

Tuesday AMRoom: Grand Harbor Salon 2March 17, 2015Location: Yacht & Beach

Session Chairs: Michael Simpson, University of Utah; Hirokazu Konishi, Osaka University

8:30 AM

Solid-State Sensing Using High Temperature Electrolytes: *Ramachandran Kumar*¹; ¹University of Cambridge

9:10 AM

Production of Titanium Oxycarbide from Titania-rich Mineral Sands: *Farzin Fatollahi-Fard*¹; Petrus Pistorius¹; ¹Carnegie Mellon University

9:50 AM Break

10:10 AM

Diffuse-Interface Electrochemical Modeling of Metal Oxidation at Elevated Temperatures: Tianle Cheng¹; *Youhai Wen*¹; ¹National Energy Technology Laboratory

10:50 AM

Experimental Thermodynamic Study on the Ag–Sb System at Elevated Temperatures: *Markus Aspiala*¹; Fiseha Tesfaye¹; Pekka Taskinen¹; ¹Aalto University

11:20 AM

Production of Fine Tungsten Powder by Electrolytic Reduction of Solid CaWO4 in Molten Salt: *Dingding Tang*¹; Dihua Wang¹; Wei Xiao¹; ¹Wuhan University

High-Temperature Systems for Energy Conversion and Storage — Solid Oxide Fuel Cell: Recent Developments I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee Program Organizers: Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Kyle Brinkman, Clemson University; Paul Ohodnicki, National Energy Technology Laboratory; Amit Shyam, Oak Ridge National Laboratory; Jung Pyung Choi, Pacific Northwest National Laboratory

Tuesday AMRoom: Grand Harbor Salon 1March 17, 2015Location: Yacht & Beach

Session Chairs: Paul Ohodnicki, National Energy Technology Laboratory; Kyle Brinkman, Clemson University

8:30 AM Introductory Comments

8:35 AM Keynote

Low Temperature Solid Oxide Fuel Cells: A Transformational Energy Conversion Technology: Eric Wachsman¹; ¹University of Maryland, College Park

9:25 AM Invited

Advanced Energy Storage through Solid Oxide Fuel Cells: Kevin Huang¹; ¹University of South Carolina

10:00 AM Break

10:15 AM Invited

 $(La_{0,6}Sr_{0,4})xCo_{0,2}Fe_{0,8}O_3$ and Related Cathode Materials in Solid Oxide Fuel Cells: *Kathy Lu*¹; Kris Shen¹; ¹Virginia Tech

10:50 AM Invited

Solid Oxide Fuel Cell Development in the Office of Research and Development at the National Energy Technology Laboratory: *Kirk Gerdes*¹; ¹U.S. Dept of Energy

11:25 AM

Synthesis of Nanocrystalline Mesoporous Cu-(CeO2-d)-YSZ Composite and Its Electrocatalytic Behavior as Anode in Solid Oxide Fuel Cells: Corina Chanquia¹; Alejandra Montenegro Hernández¹; Liliana Mogni¹; *Alberto Caneiro*¹; ¹CNEA-CONICET

Hume-Rothery Award Symposium: Multicomponent Alloy Metallurgy, the Bridge from Materials Science to Materials Engineering — Diffusion Sponsored by: TMS Functional Materials Division (formerly EMPMD),

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee

Program Organizers: Ursula Kattner, National Institute of Standards and Technology; Mark Asta, University of California at Berkeley; Raymundo Arroyave, Texas A&M University

Tuesday AM March 17, 2015 Room: Oceanic 1 Location: Dolphin

Session Chairs: Nils Warken, University of Birmingham; John Agren, KTH

8:30 AM Invited

First-Principles Statistical Mechanics and Its Role in Informing Phenomenological Descriptions of Dynamic Processes in the Solid State: *Anton Van der Ven*¹; ¹University of California

9:00 AM Invited

Analysis and Control of Interface Reactions in Multicomponent Systems: John Perepezko¹; ¹University of Wisconsin-Madison

9:30 AM Invited

Multicomponent Diffusion Couple Experiments: Opportunities and Challenges in Determining Thermo-Kinetic and Other Functional Properties: Yongho Sohn¹; ¹University of Central Florida

10:00 AM Break

10:30 AM Invited

Simulation of Concentration Evolution of Multiple Species with Kinetic Asymmetry: Application of Physical Metallurgy Fundamentals to Materials for Energy Storage: Hui-Chia Yu¹; *Katsuyo Thornton*¹; ¹University of Michigan

11:00 AM Invited

Application of Diffusion Studies to the Accelerated Development of Engineering Alloys: *Ji-Cheng Zhao*¹; ¹The Ohio State University

11:30 AM Invited

Multicomponent Diffusion Controlled Processes in Industry: Carelyn Campbell¹; ¹National Institute of Standards and Technology

Integrative Materials Design II: Performance and Sustainability — Design of Magnesium Alloys and Steels

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Materials and Society Committee

Program Organizers: Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Labs; Michael Sangid, Purdue University; Weizhou Li, Caterpillar Inc

Tuesday AMRoom: Grand Harbor Salon 8March 17, 2015Location: Yacht & Beach

Session Chairs: Weizhou Li, Caterpillar Inc.; Joy Forsmark, Ford Motor Co.

8:30 AM Invited

Can Sustainable Materials Development Ever Become Economically Feasible? Case in Point: The Evolution of the Magnesium Revolution: *Eric Nyberg*¹; Suveen Mathaudhu²; ¹Pacific Northwest National Laboratory; ²University of California Riverside

8:55 AM Invited

Using Quality Mapping to Predict Spatial Variation in Local Properties and Component Performance in Mg Alloy Body Castings: *Joy Forsmark*¹; Jacob Zindel¹; Larry Godlewski¹; Jiang Zheng²; John Allison²; Mei Li¹; ¹Ford Motor Company; ²University of Michigan

9:20 AM

Intrinsic Microstructure Modeling for Mechanistic-Based Ductility Prediction for Cast: *Erin Barker*¹; Kyoo Sil Choi¹; Xin Sun¹; ¹Pacific Northwest National Laboratory

9:40 AM

Effects of Porosity on the Ductility of Thin-Walled High Pressure Die Casting Magnesium: Kyoo Sil Choi¹; Erin Barker¹; Xin Sun¹; ¹Pacific Northwest National Laboratory

10:00 AM

Influence of Aluminum Content and Thickness on the Tensile Behavior of Mg AM Series Alloys: Erin Deda¹; John Allison¹; ¹University of Michigan

10:20 AM Break

10:30 AM Invited

Mechanistic-Based Design of Mechanical Properties in a Mg-Y Binary Alloy: Dalong Zhang; Subhash Mahajan; *Enrique Lavernia*¹; ¹University of California Davis

10:55 AM Invited

M³C – Magnesium Metal Matrix Composites: *Norbert Hort*¹; Karl Kainer¹; Hajo Dieringa¹; ¹Helmholtz-Zentrum Geesthacht

11:20 AM

Effects of MC Morphology and SDAS on Oxidation and Low Cycle Fatigue (LCF) at 950°C for Heat Resistant Austenitic Cast Steel: Hailong Zhao; Jacob Zindel¹; Larry Godlewski¹; Carlos Engler-Pinto; Yinhui Zhang; Qiang Feng; *Mei Li*¹; ¹Ford Motor Company

11:40 AM

First-Principles Study of Degradation of Mechanical Property of Oxidation and Inhibition of Chromium Alloying in Magnetite: *Ying Chen*¹; Arkapol Saendeejing¹; Ken Suzuki¹; Hideo Miura¹; ¹Tohoku University

Magnesium Technology 2015 — Deformation I Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee Program Organizers: Michele Manuel, University of Florida; Martyn

Alderman, Magnesium Elektron; Alok Singh, National Institute for Materials Science; Neale Neelameggham, Ind LLC

Tuesday AM March 17, 2015 Room: Northern Hemisphere E1 Location: Dolphin

Session Chairs: Bilal Mansoor, Texas A&M University at Qatar; Haitham El Kadiri, Mississippi State University

8:30 AM

In-Situ Neutron Diffraction Study of the Deformation Mechanisms in Solutionized Mg-Zn Alloys: *Rupalee Mulay*¹; Sean Agnew²; Carlos Caceres³; ¹Lawrence Livermore National Laboratories; ²University of Virginia; ³University of Queensland

8:50 AM

Investigation of Compression Behavior of Mg-4Zn-2(Nd,Gd)-0.5Zr at 350°C by In Situ Synchrotron Radiation Diffraction: *Ricardo Buzolin*¹; Domonkos Tolnai¹; Chamini Mendis¹; Andreas Stark¹; Norbert Schell¹; Haroldo Pinto¹; Karl Kainer¹; Norbert Hort¹; ¹Helmholtz-Zentrum Geesthacht

9:10 AM

The Deformation Behavior, Microstructure and Mechanical Properties of Cast and Extruded Mg-1Mn-xNd (wt%) at Temperatures between 50°C and 250°C: *Ajith Chakkedath*¹; Jan Bohlen²; Sangbong Yi²; Dietmar Letzig²; Zhe Chen³; Carl Boehlert¹; ¹Michigan State University; ²Magnesium Innovation Centre; ³University of Michigan

9:30 AM

Effect of Dynamic Strain Aging On the Strain Rate Sensitivity of an Mg-2Zn-2Nd Alloy: *Tong Wang*¹; Stephen Yue¹; John J. Jonas¹; ¹McGill University

9:50 AM Break

10:10 AM

The Deformation Gradient of Interfacial Defects on Twin-Like Interfaces: *Christopher Barrett*¹; Haitham El Kadiri¹; ¹Mississippi State University

10:30 AM

Geometrically Necessary Twins in Sheet Bending of an AZ31 Alloy: *Bin Li*¹; Zackery McClelland²; Stephen Horstemeyer²; ¹University of Nevada, Reno; ²Center for Advanced Vehicular Systems

10:50 AM

Dislocation-twin Interactions in Magnesium Alloy AZ31: *Fulin Wang*¹; Sean Agnew¹; ¹University of Virginia

11:10 AM

Role of Tensile Twinning on Fracture Behavior of Magnesium AZ31 Alloy: Subrahmanya Narla¹; Narasimhan R¹; Satyam Suwas¹; ¹Indian Institute of Science

11:30 AM

Deformation Twinning Effects on Texture and Microstructure of AZ31B Magnesium Rolled Samples: *Litzy Lina Catorceno*¹; Luis Flavio Herculano²; Hamilton Ferreira Gomes de Abreu²; ¹UFC-Universidade Federal do Ceará ; ²UFC-Universidade Federal do Ceará

Magnetic Materials for Energy Applications V — Permanent Magnets II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Magnetic Materials Committee

Program Organizers: Francis Johnson, GE Global Research; Raju Ramanujan, Nanyang Technological University; Paul Ohodnicki, National Energy Technology Laboratory

Tuesday AM March 17, 2015 Room: Grand Harbor Salon 7 Location: Yacht & Beach

Session Chairs: Hariharan Srikanth, University of South Florida; Lin Zhou, Ames Lab

8:30 AM Invited

Limits of Magnetic Anisotropy: *Ralph Skomski*¹; Priyanka Manchanda¹; Tushar Rana²; Renu Choudhary³; Arti Kashyap⁴; D. J. Sellmyer¹; ¹University of Nebraska; ²IIT Jaipur; ³UNL / IIT Mandi (India); ⁴IIT Mandi

9:00 AM Invited

Non-Zero Temperature Micromagnetics for Rare-Earth Permanent Magnets: Thomas Schreff¹; Simon Bance²; ¹Danube University Krems, Austria; ²St. Pölten University of Applied Sciences, Austria

9:30 AM Invited

Electronic Structure and Maximum Energy Product of Rare-Earth Free Permanent Magnet (LTP-MnBi): Jihoon Park¹; *Yang-Ki Hong*¹; Jaejin Lee¹; Woncheol Lee¹; Seong-Gon Kim²; Chul-Jin Choi³; ¹The University of Alabama; ²Mississippi State University; ³Korea Institute of Materials Science

9:50 AM Break

10:05 AM Invited

Chemical Synthesis and Rational Assembly of Magnetic Nanoparticles into Exchange-Spring Nanocomposites: *Shouheng Sun*¹; ¹Brown University

10:35 AM Invited

Ferromagnetic Nanoparticles with High Aspect Ratio: *J.Ping Liu*¹; ¹University of Texas-Arlington

11:05 AM

Influence of Surface Segregation on Magnetic Properties of FePt Nanoparticles: *Guofeng Wang*¹; Yinkai Lei¹; ¹University of Pittsburgh

11:25 AM Invited

Coercivity Enhancement of Nanostructured NdFeB Magnets by Grain Boundary Engineering: *George Hadjipanayis*¹; Rajasekhar Madugundo¹; Daniel Salazar²; José Manuel Barandiarán³; ¹Department of Physics and Astronomy, University of Delaware; ²BCMaterials; ³Faculty of Science and Technology, University of the Basque Country

11:45 AM

Role of the Applied Magnetic Field on the Microstructural Evolution

in Alnico 8 Alloys: Lin Zhou¹; Wei Tang¹; H. Dillon¹; R. McCallum¹; I. Anderson¹; *M. Kramer*¹; ¹Ames Laboratory

Materials and Fuels for the Current and Advanced Nuclear Reactors IV — Fuels III

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory

Tuesday AM	Room: Grand Harbor Salon 6
March 17, 2015	Location: Yacht & Beach

Session Chair: Dennis Keiser, Idaho National Laboratory

8:30 AM

Graphene-UO2 Composites for Accident Tolerant Nuclear Fuel: *Jie Lian*¹; Tiankai Yao¹; ¹Rensselaer Polytechnic Institute

8:50 AM

High Energy Xe Ion Irradiation Study of U-Mo/Al Dispersion Fuel: *Bei* Ye¹; Di Yun¹; Kun Mo¹; Jian Gan²; Sumit Bhattacharya³; Jeffrey Fortner¹; Walid Mohamed¹; Yeon Soo Kim¹; Gerard Hofman¹; Michael Pellin¹; Abdellatif Yacout¹; ¹Argonne National Laboratory; ²Idaho National Laboratory; ³Northwestern University

9:10 AM

Enhanced Thermal Conductivity of Uranium Dioxide-Diamond Composite Fuel: *Zhichao Chen*¹; Ghatu Subhash¹; James Tulenko²; ¹Mechanical & Aerospace Engineering Department, University of Florida; ²Materials Science & Engineering Department, University of Florida

9:30 AM

Hydrogen Migration, Precipitation, and Re-orientation of Hydrides in Spent Nuclear Fuel under Dry Storage Conditions: *Nicolas Silva*¹; Wei-Yang Lo¹; Robert Weinmann-Smith¹; Yong Yang¹; ¹University of Florida

9:50 AM

Magnetic Cr-Doped Fe-Fe Oxide Core-Shell Nanoparticles for Used Nuclear Fuel Separation: Y. Wu¹; M. Kaur²; H. Zhang²; Y. Qiang²; L. Martin³; T. Todd³; ¹Boise State University; ²University of Idaho; ³Idaho National Laboratory

10:10 AM Break

10:30 AM

Simulating Changes in Raman Spectra of Point Defects in UO₂ from Lattice Dynamics: *Eugene Ragasa*¹; Aleksandr Chernatynskiy¹; Simon Phillpot¹; ¹University of Florida

10:50 AM

Correlation between Thermal Conductivity and Microstructural Evolutions in CeO₂ upon Radiation and Fission Gas Implantation: *Yuedong Wu*¹; Heng Ban²; Xianming Bai³; Aleksandr Chernatynskiy¹; Jian Gan³; Yong Yang¹; ¹University of Florida; ²Utah State University; ³Idaho National Laboratory

11:10 AM

Hydrogen Induced Degradation Processes in ZrH₂-U Fuel: *Michele Fullarton*¹; Simon Middleburgh¹; ¹ANSTO

Materials Processing Fundamentals — Materials Processing

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: James Yurko, Materion Brush Beryllium and Composites; Antoine Allanore, Massachusetts Institute of Technology; Lifeng Zhang, University of Science and Technology Beijing; Jonghyun Lee, University of Massachusetts; Laura Bartlett, Texas State University

Tuesday AM	Room: Grand Harbor Salon 3
March 17, 2015	Location: Yacht & Beach

Session Chair: Jonghyun Lee, University of Massachusetts, Amherst

8:30 AM Invited

Relation of Local Order and Crystal-Liquid Interfacial Free Energy in Quasicrystals and Bulk Metallic Glasses: *Geun Woo Lee*¹; Byeongchan Lee²; Dong-Hee Kang; Ken Kelton; ¹Korea Research Institute of Standards and Science; ²Kyung Hee University

8:50 AM Invited

Thermophysical Properties of FeCr₂₁**Ni**₁₉ **in the Solid and Liquid Phase**: *Rainer Wunderlich*¹; Jonghyun Lee²; Robert Hyers²; Douglas Matson³; Hans Fecht¹; ¹Universität Ulm; ²University of Massachusetts; ³Tufts University

9:10 AM

Turbulent Transition in Electromagnetically Levitated Liquid Metal Droplets: *Jie Zhao*¹; Jonghyun Lee¹; Robert Hyers¹; ¹University of Massachusetts

9:30 AM

Microstructural Evolution in Cold-Sprayed Ti-6Al-4V: *Jonghyun Lee*¹; Sagar Shah¹; Trenton Bush¹; Victor Champagne²; Dennis Helfritch²; Jonathan Rothstein¹; David Schmidt¹; ¹University of Massachusetts; ²U.S. Army Research Laboratory

9:50 AM

In-Situ Gas Monitoring by Emission Spectroscopy: Thor Anders Aarhaug¹; ¹SINTEF

10:10 AM Break

10:25 AM

Ultrasonic Vibration-Assisted Laser Drilling of Materials: Seyyed Habib Alavi¹; Sandip Harimkar¹; ¹Oklahoma State University

10:45 AM

Thermodynamic Properties of Tellurium in Molten Steel: *Shun Ueda*¹; Kazuki Morita¹; ¹The University of Tokyo

11:05 AM

Improvements of Isasmelt Brick Wear Control: Pengfu Tan1; 1Glencore

11:25 AM

Foam Stability of Bubble Accumulation Stage of Gas Injection Foaming Process: Yutong Zhou¹; Yanxiang Li¹; ¹Tsinghua University

11:45 AM

Effective Dopant Activation and Reduced Dopant Diffusion of Ion Implanted Silicon at Low Temperature via Susceptor-Assisted Microwave Annealing: *Zhao Zhao*¹; N. Theodore²; Rajitha Vemuri³; Sayantan Das¹; Wei Lu⁴; S. Lau⁴; Lea Lanz⁵; Terry Alford¹; ¹Arizona State University; ²Freescale Semiconductor Inc.; ³Lam Research Co.; ⁴University of California San Diego; ⁵Norfolk State University

MHD 2015: Nagy El-Kaddah Memorial Symposium on Magnetohydrodynamics (MHD) in Materials Processing — MHD in Industry

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee Program Organizers: Ramana Reddy, The University of Alabama; Thinium Natarajan, U. S. Steel

Tuesday AM March 17, 2015

Room: Swan 2 Location: Swan

Session Chairs: Il Sohn, Yonsei University; Ashish Patel, Timet

8:30 AM Introductory Comments

8:35 AM Invited

Electromagnetic Damping of Liquid Steel Flows in Horizontal Single Belt Casting (HSBC).: *Roderick Guthrie*¹; Mihaiela Isac¹; Mahdi Aboutalebi¹; ¹McGill Metals Processing Centre

9:00 AM Invited

Effect of Ruler Electromagnetic Braking (EMBr) on Transient Turbulent Flow in Continuous Casting of Steel Slabs: *Brian Thomas*¹; Kai Jin¹; Ramnik Singh¹; S. Pratap Vanka¹; ¹University of Illinois at Urbana-Champaign

9:25 AM Invited

CFD of the MHD Mold Flow by Means of Hybrid LES/RANS Turbulence Modeling: Christoph Kratzsch¹; Rüdiger Schwarze¹; ¹TU Bergakademie Freiberg

9:50 AM Invited

Control of Slag-Dragging Effects at the Metal-Slag Interface through Electromagnetic Breaks in a Slab Mold: *Rodolfo Morales*¹; Saul Garcia²; Ismael Calderon¹; Jesus Barreto²; ¹Instituto Politecnico Nacional; ²Instituto Tecnologico de Morelia

10:15 AM Break

10:30 AM

CUFLOW: A Collaborative Computational Tool for Transport Phenomena in Materials Processing: *Surya Vanka*¹; Brian Thomas¹; Aaron Shinn²; Rajneesh Chaudhary³; Ramnik Singh⁴; Rui Liu¹; Kai Jin¹; Purushotam Kumar¹; ¹University of Illinois at Urbana Champaign; ²Exxon Research; ³ABB Research; ⁴Schlumberge Research

10:55 AM Invited

The Application of MHD Side Stirring Technology to Aluminium Melting Furnaces for Operational Efficiency Improvement – A Case Study: Alan Peel¹; Pierre Menet²; ¹ALTEK Group; ²Constellium

11:20 AM Invited

Optimization of an ElectroMagnetic Technology in ArcelorMittal Gent for Improving Products Quality in Steel Industry: *Jean-Francois Domgin*¹; Marc Anderhuber¹; Annick de Paepe²; Michäel de Doncker²; ¹ArcelorMittal R&D; ²ArcelorMittal Gent

11:45 AM Invited

Phase Separation of Hypermonotectic Alloys during Solidification in Electromagnetically Generated Gravitational Fields: Lazaro Beltran-Sanchez¹; ¹Intel Corporation

Micromechanics of Structurally Inhomogeneous Materials: An FMD Symposium in Honor of Armen Khachaturyan — Grain Growth and Plasticity

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee *Program Organizers:* Long Qing Chen, Penn State University; Mark Asta, University of California, Berkeley; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yongmei Jin, Michigan Technological University; Yann Le Bouar, LEM, CNRS/ ONERA

Tuesday AMRoom: Asia 3March 17, 2015Location: Dolphin

Session Chair: Mark Asta, University of California at Berkeley

8:30 AM Invited

The Phase Field Crystal Model: Grain Growth and Capillarity: K. McReynolds¹; V. Chan²; K. Thornton²; *Peter Voorhees*¹; ¹Northwestern University; ²University of Michigan

9:00 AM

Morphological Instability of Grain Boundaries in Two-Phase Coherent Solids: *Pierre-Antoine Geslin*¹; Yechuan Xu¹; Alain Karma¹; ¹Northeastern University

9:20 AM

Coupling Phase Field Methods with Continuum Plasticity: Yann Le Bouar¹; Maeva Cottura¹; Benoît Appolaire¹; Alphonse Finel¹; ¹LEM, CNRS/ONERA

9:40 AM Invited

Continuum Modeling of Dislocations: *Alphonse Finel*¹; Pierre-Antoine Geslin¹; Pierre-Louis Valdenaire¹; Yann Le Bouar¹; Benoît Appolaire¹; ¹ONERA-CNRS

10:10 AM Break

10:30 AM

Phase Field Modeling of Microstructure Evolution in Solder Interconnects: *Raymundo Arroyave*¹; ¹Texas A&M University

10:50 AM

Multi-Phase Field Model for Heterogeneous Nucleation at Grain Boundaries: *Rongpei Shi*¹; Yunzhi Wang¹; ¹The Ohio State University

Microstructural Processes in Irradiated Materials — Nanostructured Metallic Materials (ODS/NFA, Interfaces)

Sponsored by: TMS: Nuclear Materials Committee

Program Organizers: Dane Morgan, University of Wisconsin -Madison; Thak Sang Byun, Oak Ridge National Laboratory; Yasuyoshi Nagai, Tohoku University; Zhijie Jiao, University of Michigan; Kai Nordlund, University of Helsinki; Ming-Jie Zheng, University of Wisconsin

Tuesday AM	Room: Asia 1
March 17, 2015	Location: Dolphin

Funding support provided by: Idaho National Laboratory and Oak Ridge National Laboratory

Session Chairs: Thak Byun, Oak Ridge National Laboratory; Pascal Bellon, University of Illinois at Urbana-Champaign

8:30 AM

Overview on the Fracture Behavior of High Chromium Ferritic-Martensitic and Nanostructured Ferritic Alloys: *Thak Sang Byun*¹; David Hoelzer¹; Lizhen Tan¹; Stuart Maloy²; ¹Oak Ridge National Laboratory; ²Los Alamos National Laboratory

8:45 AM

Improved Swelling Resistance of ODS Alloys by Combining the Swelling Resistance Arising from both Dispersoids and Tempered Martensite Phase: *Tianyi Chen*¹; Jonathan Gigax¹; Di Chen¹; Eda Aydogan¹; Lloyd Price¹; Jing Wang¹; Xuemei Wang¹; Lin Shao¹; Shigeharu Ukai²; Yuedong Wu¹; Wei-Yang Lo³; Yong Yang³; Frank Garner⁴; ¹Texas A&M University; ²Hokkaido University; ³University of Florida; ⁴Radiation Effects Consulting

9:00 AM

Radiation Response of Nanolayered, Nanoporous and Nanotwinned Metals: *Xinghang Zhang*¹; Kaiyuan Yu¹; Jin Li¹; Youxing Chen¹; Haiyan Wang¹; Lin Shao¹; Mark Kirk²; Meimei Li²; Cheng Sun³; Stuart Maloy³; ¹Texas A&M University; ²Argonne National Laboratory; ³Los Alamos National Laboratory

9:15 AM

Depth-Dependence of Ion-Induced Swelling in Ferritic-Martensitic ODS Alloys: *Frank Garner*¹; Mychailo Toloczko²; Alica Certain²; Lin Shao³; Tianyi Chen³; Jonathan Gigax³; Chaochen Wei³; ¹Radiation Effects Consulting; ²Pacific Northwest National Laboratory; ³Texas A&M University

9:30 AM

Microstructures and Helium Ion Implantation Effects

in HIPed and SPSed 9Cr-ODS Steels: *Chenyang Lu*¹; Zheng Lu²; Lumin Wang¹; ¹University of Michigan; ²Northeastern University

9:45 AM

Irradiation Effects in Oxide Nanoparticle Stability in Oxide Dispersion Strengthened (ODS) Steel: *Alexander Mairov*¹; Jianchao He²; Kumar Sridharan¹; Todd Allen¹; ¹UW-Madison; ²University of Science and Technology Beijing

10:00 AM Break

10:15 AM

Ab Initio Investigation of He Bubbles at the $Y_2Ti_2O_7$ -Fe Interface in Nanostructured Ferritic Alloys: *Thomas Danielson*¹; Celine Hin¹; ¹Virginia Polytechnic Institute and State University

10:30 AM

Energetic Study of Helium Bubble Formation in Y-Ti-O Enriched Iron Matrix: Yingye Gan¹; Di Yun²; David Hoelzer³; *Huijuan Zhao*¹; ¹Clemson University; ²Argonne National Laboratory; ³Oak Ridge National Laboratory

10:45 AM

Characterization of Mesoscopic Fe - $\{111\}$, $\{110\}$ and $\{100\}$ $Y_2Ti_2O_7$ Interfaces: *Tiberiu Stan*¹; Yuan Wu¹; Stephan Kraemer¹; George Odette¹; ¹University of California Santa Barbara

11:00 AM

Investigation of bcc-Fe Interfaces with B2 Intermetallic Alloys: *Benjamin Beeler*¹; Peter Hosemann²; Mark Asta²; Niels Gronbech-Jensen¹; ¹University of California, Davis; ²University of California, Berkeley

11:15 AM

Optimum Size Effect to Achieve Enhanced Radiation Tolerance in Immiscible Cu/Fe Multilayers: *Youxing Chen*¹; Engang Fu²; Haiyan Wang¹; Yongqiang Wang³; Xinghang Zhang¹; ¹Texas A&M University; ²Peking University; ³Los Alamos National Laboratory

11:30 AM

Role of Interfaces in Trapping Implanted He in Two-Dimensional and Three-Dimensional Cu/Nb Nanocomposites: *Timothy Lach*¹; Elvan Ekiz¹; Robert Averback¹; Pascal Bellon¹; ¹University of Illinois at Urbana-Champaign

11:45 AM

In Situ Observation of Defect Annihilation in Kr Ion Irradiated Bulk Fe/ Fe₂Zr Nanocomposite Alloy: *Kaiyuan Yu*¹; Zhe Fan²; Youxing Chen²; Miao Song²; Yue Liu²; Haiyan Wang²; Mark Kirk³; Meimei Li³; Xinghang Zhang²; ¹China University of Petroleum-Beijing; ²Texas A&M University; ³Argonne National Laboratory

Multiscale Microstructure, Mechanics and Prognosis of High Temperature Alloys — Multiscale Modeling and Co-based Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: High Temperature Alloys Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Mark Tschopp, Army Research Laboratory; Jeffrey Evans, University of Alabama in Huntsville; Jonathan Cormier, ENSMA / Institut Pprime - UPR CNRS 3346; Qiang Feng, University of Science and Technology Beijing

Tuesday AM	Room: Oceanic 7
March 17, 2015	Location: Dolphin

Session Chairs: Qiang Feng, University of Science and Technology Beijing; Catherine Rae, Cambridge University; Mark Tschopp, Army Research Laboratory

8:30 AM Keynote

Multi-Scale Crystal Plasticity FEM Approach to Modeling Nickel-Based Superalloys: Somnath Ghosh¹; Shahriyar Keshavarz¹; George Weber¹; ¹Johns Hopkins University

9:10 AM

Multiscale Model of Strength in Single Crystal Tungsten under Uniaxial and Biaxial Loading: *David Cereceda*¹; Martin Diehl²; Franz Roters²; Dierk Raabe²; Jose Manuel Perlado Martin³; Jaime Marian¹; ¹Lawrence Livermore National Laboratory; ²Max-Planck-Institut für Eisenforschung; ³Instituto de Fusion Nuclear. Universidad Politecnica de Madrid

9:30 AM

Impact of Microstructure Evolutions on the Stress/Strain Distribution at Grain Boundaries in Ni-Based Superalloys: *Celine Gerard*¹; Jonathan Cormier¹; Nikolay Osipov²; Djamel Missoum-Benziane²; Alexandre Morel³; ¹Institut Prime, CNRS-ENSMA-Université de Poitiers; ²Mines Paristech -CNRS UMR 7633; ³Université de Poitiers

9:50 AM Invited

Modelling Creep in Single Crystal Superalloys: Enrique Galindo-Nava; Narges Tabrizi; *Catherine Rae*¹; ¹Cambridge University

10:10 AM Break

10:30 AM Invited

Microstructure and Creep Properties of Boron and Titanium Containing Cobalt-Based Superalloys: Peter Bocchini¹; David Seidman¹; David Dunand¹; ¹Northwestern University

10:50 AM Invited

Influence of Ru on the Microstructural Evolution of Gamma Plus Gamma-Prime-Strengthened Co-Base Superalloys: Daniel Sauza¹; Peter Bocchini¹; David Seidman¹; David Dunand¹; ¹Northwestern University

11:10 AM

Creep Deformation Mechanisms and HRSTEM EDS Mapping of Stacking Faults in L12-Containing Co-Base Superalloys: *Michael Titus*¹; Alessandro Mottura²; G. Viswanathan³; Akane Suzuki⁴; Michael Mills³; Tresa Pollock¹; ¹University of California Santa Barbara; ²University of Birmingham; ³The Ohio State University; ⁴GE Global Research

11:30 AM

Portevin-Le Chatelier Effect in a Ni-Co Base Superalloy: *Chuanyong Cui*¹; Kui Du¹; Xiaofeng Sun¹; ¹Institute of Metal Research

11:50 AM Invited

Creep Mechanism of a Ni-Co Based Wrought Superalloy with Low Stacking Fault Energy: Chenggang Tian¹; Chuanyong Cui¹; *Xiaofeng Sun*¹; ¹Institute of Metal Research

Nanocomposites III — Ceramic or Metalloid (Si or C) Nanocomposites I

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Muralidharan Paramsothy, National University of Singapore, NanoWorld Innovations (NWI); Meisha Shofner, Georgia Institute of Technology; Changsoo Kim, University of Wisconsin-Milwaukee

Tuesday AM March 17, 2015 Room: Europe 2 Location: Dolphin

Session Chair: Simona Hunyadi Murph, Savannah River National Laboratory

8:30 AM

Interfacial Fracture in Ceramic Nanocomposites Reinforced with ALD Coated Carbon Nanotubes: Xin Liang¹; Phillip Loya²; Sugeetha Vasudevan¹; Jun Lou²; *Brian Sheldon*¹; ¹Brown University; ²Rice University

8:50 AM Invited

Carbon Nanomaterials Enabled Thin Film Piezoresistive Sensors: *Tao Liu*¹; ¹Florida State University

9:30 AM Invited

The Effect of Si- and Al-Based Additives on the Densification and Microstructure of Boron Carbide: Jerry LaSalvia¹; *Kris Behler*¹; Adam Hutchinson¹; David Manoukian²; ¹U.S. Army Research Laboratory; ²Rutgers University

10:10 AM Break

10:30 AM

Zn2+ Solubilization and Segregation Influence in Macroscopic Properties of SnO2 Nanopowders: *Deise Cristina Rosário*¹; Douglas Gouvea¹; ¹University of São Paulo

10:50 AM

Synthesis of Nanosized Zn1-xCoxAl2O4 Spinels Obtained by Liquid Feed-Flame Spray Pyrolysis Method: Ceramic Pigments Application: *Natalia Betancur Granados*¹; Eongyu Yi²; Richard Laine²; Oscar Restrepo Baena¹; ¹Universidad Nacional de Colombia; ²University of Michigan

11:10 AM

Electronic Structure of Copper Decorated Carbon Nanotubes: *Jingyin Jiang*¹; Chengyu Yang¹; Quanfang Chen¹; ¹University of Central Florida

11:30 AM

Sol-gel/Hydrothermal Method for the Synthesis of Ultralong (NH4)2V6O16•1.5H2O Nanobelts: *Liang Wang*¹; Hong-Yi Li¹; Chuang Wei¹; Yu Wang¹; Bing xie¹; ¹Chongqing University

Nanostructured Materials for Rechargeable Batteries and for Supercapacitors III — Session III: In Situ TEM for Batteries

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee *Program Organizers:* Reza Shahbazian-Yassar, Michigan Technological University; Yan Yao, University of Houston; David Mitlin, Clarkson University

Tuesday AM March 17, 2015 Room: Europe 3 Location: Dolphin

Session Chairs: Reza Shahbazian-Yassar, Michigan Technological University; Haimei Zheng, Lawrence Berkeley National Laboratory

8:30 AM Invited

In Situ Study of Nanostructure Evolution at Electrode-Electrolyte Interfaces in Li-S Batteries: *Haimei Zheng*¹; ¹Lawrence Berkeley National Lab

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8:55 AM Invited

Multiscale Correlation of Structure and Chemistry of Electrode Materials and Their Properties for Lithium Ions and Beyond: *Chongmin Wang*¹; ¹Pacific Northwest National Laboratory

9:20 AM Invited

Dynamic Phenomena in Nano-Structured Electrode Materials for Electrochemical Energy Storage: *Shirley Meng*¹; ¹U.C. San Diego

9:45 AM Invited

In-Situ TEM Characterization on Dynamic Lithiation Process in Nanostructured Electrodes: *Scott Mao*¹; ¹University of Pittsburgh

10:10 AM Break

10:25 AM

Li Transport and the Coupled Structural Evolution in Rechargeable Batteries: Reza Shahbazian-Yassar¹; ¹Michigan Technological University

10:45 AM Invited

In Situ Transmission Electron Microscopy of Deposition on Battery Electrodes: *Todd Brintlinger*¹; Olga Baturina¹; Corey Love¹; ¹U.S. Naval Research Laboratory

11:10 AM Invited

Electrochemical Lithiation Behavior of Individual Co₉S₈/Co-Filled Carbon Nanotubes: *Wenzhi Li*¹; Qingmei Su²; Gaohui Du²; ¹Florida International University; ²Zhejiang Normal University

11:35 AM Invited

Phases and Dynamics of Intercalation in AFePO₄ (A= Li or Na) Positive Electrode Materials: *Philippe Moreau*¹; Joel Gaubicher¹; Florent Boucher¹; Lenaic Madec¹; Marine Cuisinier¹; Donatien Robert²; Pascale Bayle-Guillemaud³; Dominique Guyomard¹; ¹Institut des Matériaux Jean Rouxel; ²CEA/LITEN; ³CEA/INAC

12:00 PM Invited

Controllable Lithium Polyselenides Presence in the New Li-Se Rechargeable Battery System: *Ali Abouimrane*¹; Yanjie Cui¹; Khalil Amine¹; ¹Argonne National Laboratory

Neutron and X-Ray Studies of Advanced Materials VIII: Diffraction Limit and Beyond — Elastic and Inelastic Scattering

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Brent Fultz, California Institute of Technology; Peter Liaw, University of Tennessee; Jaimie Tiley, Air Force Research Laboratory

Tuesday AM	Room: Pelican 1
March 17, 2015	Location: Swan

Funding support provided by: Air Force Research Laboratory

Session Chairs: Brent Fultz, Caltech; Olivier Delaire, ORNL

8:30 AM Keynote

Use of Stochastic Models in the Interpretation and Analysis of Diffuse Scattering: *Richard Welberry*¹; ¹Research School of Chemistry

9:10 AM Invited

Bulk and Near-Surface Microstructure of Fe-27 at.% Pt: Bernd Schoenfeld¹; ¹ETH Zurich

9:40 AM Invited

Phonon Localization Generates Polar Nanoregions in Relaxor Ferroelectrics: *Michael Manley*¹; Jeff Lynn²; Douglas Abernathy¹; Eliot Specht¹; Olivier Delaire¹; Alan Bishop³; Raffi Sahul⁴; John Budai¹; ¹Oak Ridge National Laboratory; ²NIST Center for Neutron Research; ³Los Alamos National Laboratory; ⁴TRS Technologies

10:10 AM Break

10:20 AM Invited

Early Stage of Structure Change in Synchronized Long-Range Stacking Ordered Structures in Mg-Y-Zn and Related Alloy Systems: *Hiroshi Okuda*¹; Hitoto TANAKA¹; Michiaki Yamasaki²; Yoshihito Kawamura²; Shigeru Kimura³; ¹Kyoto University; ²Kumamoto University; ³JASRI SPring-8

10:50 AM Invited

Localized (Selective) Dissolution of Corrosion Model Systems: Frank Renner¹; ¹Hasselt University

11:20 AM Invited

Neutron and X-Ray Scattering Experiments on Levitated Liquid Droplets of Glass-Forming Alloys: *Dirk Holland-Moritz*¹; ¹German Aerospace Center (DLR)

11:50 AM Invited

Anharmonic Lattice Dynamics in Ferroelectrics and Thermoelectrics: Neutron Scattering Experiments and First-Principles Simulations: *Olivier Delaire*¹; Chen Li¹; Jiawang Hong¹; Andrew May¹; Huibo Cao¹; Lynn Boatner¹; ¹Oak Ridge National Laboratory

New Horizons for Mechanical Spectroscopy in Materials Science — Surfaces, Films and Interfaces and Nonlinear Acoustics

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Nicolás Mujica, Universidad de Chile; Michael Demkowicz, MIT; Fernando Lund, Universidad de Chile; Alfredo Caro, Los Alamos National Laboratory

Tuesday AM	Room: Macaw 1
March 17, 2015	Location: Swan

Session Chair: Alfredo Caro, Los Alamos National Laboratory

8:30 AM Invited

Studies of Metal-Metal Interfaces: *Ricardo Schwarz*¹; ¹Los Alamos National Laboratory

9:00 AM Invited

Resonance Ultrasound Microscopy for Imaging Young's Modulus of Solids: Masahiko Hirao¹; H. Ogi¹; ¹Osaka University

9:30 AM

Application of Resonant Ultrasound Spectroscopy to Film-Growth Monitoring on Quartz Substrate: *Nobutomo Nakamura*¹; Naoto Yoshimura¹; Hirotsugu Ogi¹; Masahiko Hirao¹; ¹Osaka University

9:50 AM

Viscoelasticity of Stepped Interfaces: Scott Skirlo¹; *Michael Demkowicz*¹; ¹Massachusetts Institute of Technology

10:10 AM Break

10:30 AM Invited

Physical Properties of Nuclear Fuel Surrogates Using Laser Ultrasonics: *David Hurley*¹; Marat Khafizov¹; Robert Schley¹; Eric Burgett²; ¹Idaho National Laboratory; ²Idaho State University

11:20 AM

Ultrasound – Linear and Nonlinear – As a Quantitative Probe of Plasticity I: Theory: Nicolas Mujica¹; Maria Cerda¹; Carolina Espinoza¹; Rodrigo Espinoza¹; Judit Lisoni¹; *Fernando Lund*¹; ¹Universidad de Chile

11:00 AM

Ultrasound – Linear and Nonlinear – As a Quantitative Probe of Plasticity II: Experiments: *Nicolás Mujica*¹; María Teresa Cerda¹; Carolina Espinoza¹; Rodrigo Espinoza¹; Judit Lisoni¹; Fernando Lund¹; ¹Universidad de Chile

Novel Synthesis and Consolidation of Powder Materials — Powder Metallurgy of Light Alloys (Ti, AI, Mg) and Composites I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: Ma Qian, RMIT University (Royal Melbourne Institute of Technology); Iver E Anderson, The Ames Laboratory

Tuesday March 1

AM	Room: Swan 10
7, 2015	Location: Swan

Session Chairs: Iver Anderson, The Ames Laboratory; Yong Liu, Central South University

8:30 AM

A Study on Dynamic Consolidation of Titanium Powder for Manufacture of Compacts and Foams: Anupam Vivek¹; Alexander Koenig¹; Glenn Daehn¹; ¹Ohio State University

8:50 AM

The Micro-Mechanical Behavior of Electron Beam Melted Ti-6Al-4V Alloy: Yuan-Wei Chang¹; Tait McLouth¹; Marta Pozuelo¹; Chun-Ming Chang²; John Wooten3; Jenn-Ming Yang1; ¹University of California, Los Angeles; ²National Tsing Hua University; ³CalRAM Inc.

9:10 AM Invited

Synthesis and Consolidation of Inhomogeneous Ti-M(M=Ta, Mg) **Composite Structures by Powder Metallurgy for Biomedical Applications:** Yong Liu¹; Bin Liu¹; Xiang Xiong¹; Huiping Tang²; ¹Central South University; ²Northwestern Institute of Nonferrous Metals Research

9:35 AM Invited

'Industrial Grade' Titanium Parts from Powder Compact Forging and Extrusion: Brian Gabbitas1; 1University of Waikato

10:00 AM Break

10:20 AM Keynote

Development of P/M Parts & Techniques in Japan: Hideshi Miura¹; 1Kyushu University

10:55 AM

Fabrication and Characterization of Aluminum Composition Reinforced by Boron Nitride Nano Sheet: Seungjin Nam1; Junyeon Hwang2; Hyunjoo Choi1; 1Kookmin University; 2Korea Institute of Science and Technology

11:15 AM

Microstructural Evolution of Cryomilled Boron Carbide Reinforced Al-Mg Powders: Gaunt Murdock¹; Hanry Yang²; Juie M. Schoenung²; Enrique J. Lavernia²; Troy D. Topping¹; ¹California State University, Sacramento; ²University of California Davis

Pb-Free Solders and Emerging Interconnect and Packaging — Lead-Free Solder Reliability

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Electronic Packaging and Interconnection Materials Committee Program Organizers: John Elmer, Los Alamos National Laboratory; Yan Li, Intel Corp.; Andre Lee, Michigan State University; Fan-Yi Ouyang, National Tsing Hua University; Srini Chada, Schlumberger; Kyu-Oh Lee, Intel Corp.; Kwang-Lung Lin, National Cheng Kung University; Christopher Gourlay, Imperial College; Daniel Lewis, Rensselaer Polytechnique Institute; Fan Gao, U. Masachusetts Lowell

Tuesday AM March 17, 2015 Room: Lark Location: Swan

Session Chairs: Srini Chada, Schlumberger; Christopher Gourlet, Imperial College

8:30 AM

Investigation of Deformation-Induced Sn Whiskers for Growth Mechanism and Mitigation Method: Jaewon Chang¹; Sung Kang²; Jae-Ho Lee³; Keun-Soo Kim⁴; Hyuck Mo Lee¹; ¹KAIST; ²IBM T.J. Watson Research Center; ³Hongik University; ⁴Hoseo University

8:55 AM

Nucleation and Growth of Thermally-Induced Sn Whiskers and Their Relation to Plastic Strain Relaxation: Fei Pei¹; Eric Chason¹; ¹Brown University

9:20 AM

Effect of Solute Addition and Grain Structure Modification on Boundary Diffusion and Whisker Growth in Tin Coatings: Lutz Meinshausen¹; Soumik Banerjee¹; Indranath Dutta¹; Bhaskar Majumdar²; Andrea Buckel²; ¹Washington State University; ²New Mexico Tech

9:45 AM

In-Situ Tensile Behavior of Tin Whiskers: Venkata Sathya Sai Renuka Vallabhaneni1; Ehsan Izadi1; Sudhanshu Singh1; Carl Mayer1; Jagannathan Rajagopalan1; Nikhilesh Chawla1; 1Arizona State University

10:10 AM Break

10:25 AM

Impact of Elevated Temperature Environment on Sn-Ag-Cu Interconnect Board Level High G Mechanical Shock Performance: Tae-Kyu Lee1; Thomas R. Bieler²; Choong-Un Kim³; ¹Cisco Systems; ²Michigan State University; ³University of Texas, Arlington

10:50 AM

Electrochemical Study of Cu-Al IMCs for Service Reliability of Wire Packages: Yuelin Wu1; KN Subramanian1; Andre Lee1; 1Michigan State University

11:15 AM

Impact Strength of Sn-Bi/Cu Joints Soldered by Laser Process: Hiroshi Nishikawa1; Shinya Kubota1; 1Osaka University

11:40 AM

Microstructure Evolution and Stress-Strain Analysis of Wafer Level Chip Scale Package Corner Joints with Different Thermal Conditions and Thermal Cycles Using In-Situ HE-XRD Method: Quan Zhou¹; Chen Zhang1; Thomas Bieler1; Tae-kyu Lee2; 1Michigan State University; 2Cisco Systems Inc.



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Phase Transformations and Microstructural Evolution — Steels I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Soumya Nag, University of North Texas; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama ; Amy Clarke, Los Alamos National Laboratory; Frederic Danoix, CNRS - Université de Rouen; Emmanuelle Marquis, University of Michigan

Tuesday AM	Room: Swan 3
March 17, 2015	Location: Swan

Session Chairs: Sybrand van der Zwaag, Technical University Delft; Mohamed Gouné, Université de Bordeaux

8:30 AM Invited

New Insights into Alloying Elements Interaction with Interfaces by Coupling Advanced Experimental Techniques and Modelling: *Goune Mohamed*¹; Fréderic Danoix²; Xavier Sauvage²; Didier Huin³; Sebastien Allain²; ¹ICMCB-Bordeaux1; ²University of Rouen; ³ArcelorMittal

9:00 AM

Quenching and Partitioning Process Development to Replace Hot Stamping of High Strength Automotive Steel: *Daniel Coughlin*¹; Dean Pierce²; Emmanuel De Moor²; Kester Clarke¹; Amy Clarke¹; Robert Hackenberg¹; Omer Dogan³; Paul Jablonski³; ¹Los Alamos National Laboratory; ²ASPPRC, Colorado School of Mines; ³National Energy Technology Laboratory

9:20 AM Invited

Spinodal Decomposition in Fe-Ni-C Martensite: Atomistic Modelling Versus Experience: *Mykola Lavrsky*¹; Frederic Danoix¹; Armen Khachaturyan²; Helena Zapolsky¹; ¹University of Rouen; ²Department of Materials Science and Engineering, University of California Berkeley

9:50 AM Break

10:10 AM Invited

The Effect of Mn, Mo, Si and Ni on the Bainitic Stasis in Ternary and Quaternary Fe-C-X-(Y) Alloys: Sybrand Van Der Zwaag¹; hao Chen¹; Hussein Farahani¹; Wei Xu¹; ¹Technical University Delft

10:40 AM Invited

Granularization Processes at Low Temperature of Lath Bainitic Microstructures in FeNiC Alloys: *Sébastien Allain*¹; Meriem Ben Haj Slama²; Nathalie Gey²; Lionel Germain²; Kangying Zhu³; ¹Institut Jean Lamour; ²Lem3; ³Arcelormittal Maizières Research SA

11:10 AM Invited

Microstructural Characteristics of Austenite Formed from Lath Martensite via Martensitic Reversion: Nobuo Nakada¹; T. Tsuchiyama¹; Setsuo Takaki; ¹Kyushu University

Polycrystalline Materials: Bringing Together Experiments, Simulations, and Analytic Theories – Session III

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Dana Zöllner, Otto von Guericke University Magdeburg; Douglas Medlin, Sandia National Laboratories; Dmitri Molodov, RWTH Aachen

Tuesday AM	Room: Oceanic 8
March 17, 2015	Location: Dolphin

Session Chairs: Douglas Medlin, Sandia National Laboratories; Nathalie Bozzolo, MINES ParisTech

8:30 AM Invited

A New Look at Abnormal Grain Growth: *Matthias Militzer*¹; Thomas Garcin¹; Mohammad Abdur Razzak¹; Michel Perez²; ¹The University of British Columbia; ²INSA de Lyon

9:00 AM

X-Ray Imaging of Recrystallization and Precipitate Pinning in Al-1.4 wt% Cu: *Paul Gibbs*¹; Seth Imhoff¹; Kester Clarke¹; Kamel Fezzaa²; Wak-Keat Lee³; Anthony Rollett⁴; Amy Clarke¹; ¹Los Alamos National Laboratory; ²Argonne National Laboratory; ³Brookhaven National Laboratory; ⁴Carnegie Mellon University

9:20 AM

Investigation of GB Pinning using Phase Field Modeling and Analytical Theory: *Michael Tonks*¹; Yongfeng Zhang¹; ¹Idaho National Laboratory

9:40 AM

Evolution of Microstructure and Transformation Texture during Alpha Precipitation in Polycrystalline Titanium Alloys: *Rongpei Shi*¹; Stephen Niezgoda¹; Yunzhi Wang¹; ¹The Ohio State University

10:00 AM

The Effect of Bimodal Grain Size Conditions on Abnormal Grain Growth: *Catherine Sahi*¹; Steven Chiu¹; Peter Kellner¹; Jon Madison²; Robert DeHoff¹; Burton Patterson¹; ¹University of Florida; ²Sandia National Laboratories

10:20 AM Break

10:40 AM Invited

Modeling Abnormal Grain Growth with Grain Boundary Complexion Transitions: Anthony Rollett¹; William Frazier¹; *Gregory Rohrer*¹; ¹Carnegie Mellon University

11:10 AM

Impact of Grain Boundary Character on Faceting and Migration of Low Angle Boundaries and Grain Rotation: Experiments and Simulations: Jann-Erik Brandenburg¹; Luis Barrales-Mora¹; *Dmitri Molodov*¹; ¹RWTH Aachen University

11:30 AM

Grain Boundary Mediated Plasticity: In-situ TEM Experiments and Simulations: *Marc Legros*¹; Armin Rajabzadeh¹; Frédéric Mompiou¹; Nicolas Combe¹; ¹CEMES-CNRS

11:50 AM

Boundary Roughening and Repetitive Grain Growth Behavior in Nano-Grained Nickel: Experimental Support for the Microstructural Evolution Principle: Suk-Joong L. Kang¹; Sang-Hyun Jung¹; ¹KAIST

Rare Metal Extraction & Processing 2015 — Rare Earth Metals

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee *Program Organizers:* Neale Neelameggham, Ind LLC; Shafiq Alam, University of Saskatchewan; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto Kennecott Utah Copper

Tuesday AM	Room: Asbury C
March 17, 2015	Location: Yacht & Beach

Session Chairs: Neale R Neelameggham, IND LLC; Joon Soo Kim, Chonnam National University

8:30 AM

Status of Separation and Purification of Rare Earth Elements from Korean Ore: Joon Soo Kim¹; Jin-Young Lee¹; Rajesh Kumar Jyothi¹; ¹KIGAM

8:50 AM

Optimization of Rare Earth Leaching: *Grant Wallace*¹; Sean Dudley¹; ¹Montana Tech of the Univ of MT

9:10 AM

Numerical Simulation of the Mass Transfer for Rare-Earth Concentrate in Leaching Process: Tingyao Liu¹; Yong Sheng¹; Teng Yang¹; Bao Wang²; Liuhui Han³; *Qing Liu*¹; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing; ²Department of Engineering, University of Leicester,UK; ³School of Metallurgical and Ecological Engineering

9:30 AM

Apatite Concentrate, A Potential New Source of Rare Earth Elements: *Tianming Sun*¹; Mark Kennedy²; Gabriella Tranell²; Ragnhild Elizabeth Aune²; ¹KTH; ²NTNU

9:50 AM Break

10:05 AM

Rare Earth Elements Gallium and Yttrium Recovery From (KC)Korean Red Mud Samples by Solvent Extraction and Heavy Metals Removal/ Stabilization by Carbonation: Thenepalli Thriveni¹; Seong Young Nam¹; *Ahn Ji Whan*¹; ¹Korea Institute of Geosciences and Mineral Resources(KIGAM)

10:25 AM

Rare Earth Element Recovery and Resulting Modification of Resin Structure: *Sean Dudley*¹; ¹Montana Tech of the U of M

10:45 AM

Electrochemical Reduction of Eu(III) for the Recovery of Eu from Rare Earth Materials Solution Using Channeled Cell: *Kyeong Woo Chung*¹; Jinyonug Lee¹; ¹Korea Institute of Geosicence and Mineral Resources

11:05 AM

Ultra High Temperature Rare Earth Metal Extraction by Electrolysis: *Bradley Nakanishi*¹; Guillaume Lambotte¹; Antoine Allanore¹; ¹Massachusetts Institute of Technology

Recent Developments in Biological, Structural and Functional Thin Films and Coatings — Session III

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee Program Organizers: Adele Carradò, IPCMS; Heinz Palkowski, Clausthal Univ of Technology; Roger Narayan, University of North Caroloina; Nuggehalli Ravindra, New Jersey Institute of Technology; Nancy Michael, University of Texas at Arlington

Tuesday AM	Room: Parrot
March 17, 2015	Location: Swan

Session Chairs: Heinz Palkowski, TU Clausthal; Adele Carrado, IPCMS University of Strasbourg

8:30 AM Keynote

Interface Characterization of Thermal Spray Coatings via Nanoindentation Methods: Andrew Robertson¹; Kenneth White¹; ¹University of Houston

9:10 AM

Autocatalytic Ni-P and Ni-B Deposition on SiC Ceramic Particles: *Isil Kerti*¹; Gökçe Sezen¹; Ayfer Kiliçarslan¹; Sibel Daglilar¹; ¹Yildiz Technical University

9:30 AM Invited

The Intrinsic Size-Dependent Plasticity of Mg/Ti Multilayer Thin Films: *Yuanyuan Lu*¹; Jonathan Ligda²; Ruben Kotoka³; Brian Schuster²; Sergey Yarmolenko³; Qiuming Wei¹; ¹The University of North Carolina at Charlotte; ²US Army Research Laboratory; ³NC A&T State University

10:00 AM Break

10:20 AM

Ultra-Fast Boriding and Surface Hardening of Low Carbon Steel: Bakr Rabeeh¹; ¹German University in Cairo, GUC

10:40 AM

Phase Stability in Nanostructured Electrodeposited Cobalt-Phosphorous Coatings: *Sriram Vijayan*¹; Na Luo¹; John Carpenter²; Amit Datta²; Mark Aindow¹; ¹University of Connecticut; ²US Chrome Corporation

11:00 AM

Enhanced Corrosion Resistance of Laser Alloyed Al-W Coatings in 3.5% NaCl Solution: *Ravi Rajamure*¹; Hitesh Vora¹; Srinivasan Sriviliputhur¹; Narendra Dahotre¹; ¹University of North Texas

11:20 AM

Magnetic Field Assisted Directed and Deterministic Assembly: B. S. Mani¹; Nuggehalli Ravindra¹; ¹New Jersey Institute of Technology

11:40 AM

Thermoelectric Properties of Si-Ge Systems: Aniketannasaheb Maske¹; Bhakti Jariwala²; Nuggehalli Ravindra¹; ¹New Jersey Institute of Technology; ²S.V. National Institute of Technology

Strip Casting of Light Metals — Process Technology

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee, TMS: Magnesium Committee

Program Organizers: Kai Karhausen, Hydro Aluminium Rolled Products GmbH; Wim Sillekens, European Space Agency; Murat Dundar, Assan Aluminium; Jan Bohlen, Helmholtz-Zentrum Geesthacht; Dietmar Letzig, MagIC - Magnesium Innovation Centre, Helmholtz-Zentrum Geesthacht Zentrum für Material- und Küstenforschung GmbH

Tuesday AM	Room: Northern Hemisphere E2
March 17, 2015	Location: Dolphin

Session Chairs: Kai Karhausen, Hydro Aluminium Rolled Products; Jan Bohlen, Helmholtz-Zentrum Geesthacht

8:30 AM Introductory Comments

8:40 AM Keynote

Magnesium Twin-Roll Casting Benefits from Aluminium Heritage: Frederic Basson¹; ¹Novelis PAE

9:10 AM

Innovations in the Process Technology for Manufacturing Magnesium Alloy Sheet: Enrico Romano¹; Roberto Passoni¹; Chris Romanowski¹; ¹FATA Hunter

9:30 AM

The Importance of Heat Removal for Productivity in Industrial Twin Roll Casting of Aluminium: *Christian Schmidt*¹; Andreas Buchholz¹; Kai-Friedrich Karhausen¹; ¹Hydro Aluminium Rolled Products GmbH

9:50 AM

A Single Roll Caster Equipped with a Scraper: *Toshio Haga*¹; ¹Osaka Institute of Technology

10:10 AM Break

10:30 AM

Effect of Casting Parameters on Microstructure, Recrystallization Behaviour and Final Material Properties of Twin-Roll Cast 1050 Alloy: *Cemil Isiksaçan*¹; Onur Meydanoglu¹; Vakur Ugur Akdogan¹; Gökhan Alper¹; Baris Beyhan¹; ¹Assan Alüminyum A.S

10:50 AM

Comparison of Twin-Roll Casting and High-Temperature Roll Bonding for a Steel-Clad Aluminum Strip Production: *Olexandr Grydin*¹; Mirko Schaper¹; Mykhailo Stolbchenko¹; ¹University of Paderborn

11:10 AM

Casting of Clad Strip by a Twin Roll Cater: *Toshio Haga*¹; ¹Osaka Institute of Technology

11:30 AM

High Strength Aluminum Alloy Sheets Fabricated by Twin Roll Casting for Automobile Application: *Hyoung-Wook Kim*¹; Yun-Soo Lee¹; Min-Seok Kim¹; Cha-Yong Lim¹; ¹Korea Institute of Materials Science

Structural Materials, Heat Transport Fluids, and Novel System Designs for High Power and Process Heat Generation — Heat Transport Fluids II

Sponsored by: TMS Structural Materials Division, TMS Functional Materials Division (formerly EMPMD), TMS: Corrosion and Environmental Effects Committee, TMS: Energy Conversion and Storage Committee, TMS: Nuclear Materials Committee *Program Organizers:* Peter Hosemann, UC Berkeley; Peiwen Li, University of Arizona; Kumar Sridharan, University of Wisconsin; Bruce Pint, Oak Ridge National Laboratory

Tuesday AM March 17, 2015 Room: Asbury B Location: Yacht & Beach

Session Chairs: Kumar Sridharan, University of Wisconsin ; Peiwen Li, The University of Arizona

8:30 AM Invited

Fundamentals of Liquid Metal Corrosion and Techniques for Assessment of Compatibility: Steven Pawel¹; ¹Oak Ridge National Laboratory

9:10 AM

Factors Affecting the Dissolution Corrosion of 316L Austenitic Stainless Steels in Contact with Static LBE: Konstantina Lambrinou¹; ¹SCK-CEN

9:30 AM Invited

Molten Salts as High Temperature Heat Transfer Fluids (HTF) and Thermal Energy Storage (TES): Judith Gomez¹; ¹National Renewable Energy Laboratory

10:10 AM Break

10:30 AM

Computation-Guided Design of Structural Alloys for Use in High Temperature Liquid Fluoride Salt Environments: Govindarajan Muralidharan¹; Dane Wilson¹; ¹Oak Ridge National Laboratory

10:50 AM

Molecular Dynamics Studies of Viscosity and Thermal Conductivity of NaCl-KCl-ZnCl₂ Melts: *Stefan Bringuier*¹; Nichlas Swinteck¹; Venkateswara Rao Manga¹; Pierre Deymier¹; Krishna Muralidharan¹; ¹University of Arizona

11:10 AM

Corrosion Evaluation of Materials for Supercritical Carbon-Dioxide Power Conversion Systems: *Kumar Sridharan*¹; Mark Anderson¹; Jacob Mahaffey¹; Paul Roman¹; ¹University of Wisconsin

11:30 AM

Corrosion Test of Low Temperature Colossal Super-Saturation Engineered 316L Material: Wei Niu¹; Scott Lillard¹; ¹University of Akron

11:50 AM

Structural Characterization of ZnCl₂ based Molten Salts using Raman Spectroscopy and Quantum Chemical Methods: *Venkateswara Rao Manga*¹; Stefan Bringuier¹; Abduljabar Alsayoud¹; Pierre Lucas¹; Krishna Muralidharan¹; Pierre Deymier¹; ¹University of Arizona

12:10 PM

Study of 304-Stainless Steel Performances in Supercritical Water Coller Reactor Conditions: Andrej Zeman; ¹International Atomic Energy Agency

2015 Functional Nanomaterials: Energy and Sensing — Sensing and Electronics II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee

Program Organizers: Jung-Kun Lee, University of Pittsburgh; Behrang Hamadani, National Institute of Standards and Technology; Sung Hun Wee, HGST, a Western Digital Company; Nitin Chopra, University of Alabama, Tuscaloosa; Terry Xu, The University of North Carolina at Charlotte; Jang-Sik Lee, Pohang University of Science and Technology (POSTECH) POSTECH

Tuesday PM	Room: Swan 4
March 17, 2015	Location: Swan

Session Chair: Nitin Chopra, University of Alabama

2:00 PM Invited

IOM/Mehl Award: The Role of Materials Science in Microelectronics: Past, Present and Future: Subhash Mahajan¹; ¹University of California Davis

2:40 PM

The Role of Structure Directing Agent on the Formation of Copper Nanowires: A DFT Study: Soon Ho Kwon¹; Hyuck Mo Lee¹; ¹KAIST

3:00 PM Invited

DFT Study of 2D TMD Layers for Device Applications: Santosh KC¹; Chenxi Zhang¹; Cheng Gong¹; *Kyeongjae Cho¹*; ¹UT Dallas

3:40 PM Break

3:55 PM Invited

Template-free Electrochemical Synthesis of Nanowires and Applications to Nanodevices: Sun Hwa Park¹; Hyun Min Park¹; *Jae Yong Song*¹; ¹Korea Research Institute of Standards and Science

4:35 PM Invited

Anamolus Emission in Organic Conjugated Metal Oxide Nanoparticles: *S* Seal¹; Michael Leuenberger¹; Andre Gesquire¹; Sanku Mallik²; ¹UCF; ²NDSU

5:15 PM

Theoretical and Experimental Investigations of Nanometric Alkali Oxide Layers on Silicon as Low Work Function Electrodes for Thermionic Converters: Abu Asaduzzaman¹; *Krishna Muralidharan*¹; Pierre Deymier¹; François Morini²; Valentina Giorgis²; Jean-François Robillard²; Emmanuel Dubois²; ¹University of Arizona; ²IEMN

5:35 PM

DC Electric Field Induced Phased Array Self-Assembly of Au Nanoparticles: Sagar Yadavali¹; Ramakrishnan Kalyanaraman¹; ¹University of Tennessee

6th International Symposium on High Temperature Metallurgical Processing — Fundamental Research of Metallurgical Processes III

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Gerardo Alvear, Xstratatech; Onuralp Yucel, Istanbul Technical University; Xinping Mao, Wuhan Iron and Steel Corporation; Hong Yong Sohn, University of Utah; Naiyang Ma, ArcelorMittal; Phillip Mackey, P.J. Mackey Technology; Tom Battle, Midrex Technologies

Tuesday PM	Room: Swan 5
March 17, 2015	Location: Swan

Session Chairs: Daqiang Cang, University of Science & Technology Beijing; Deqing Zhu, Central South University

2:00 PM

Progress on Protection of Titanium-bearing Materials in Chinese Blast Furnace: *Qiuye Cai*¹; Jianliang Zhang¹; Kexin Jiao¹; Cui Wang¹; ¹University of Science and Technology Beijing

2:20 PM

Ecomaister-Hatch Technology: Reliable Commercial-Scale Slag Valorisation Option for Metal Producers: *Lily Lai Chi So*¹; Santiago Faucher¹; Sina Mostaghel¹; Victor Hernandez¹; ¹Hatch Ltd.

2:40 PM

Homogeneous Nucleation Control in Deep-Overcooled Liquid Metals for Finer Crystal Structure: *Daqiang Cang*¹; Lingling Zhang¹; Yanbing Zong¹; ¹University of Science and Technology Beijing

3:00 PM

 Study on Inclusions in CuCr Prepared by Thermit Reduction

 -Electromagnetic Casting: Dou Zhihe¹; Wang Cong¹; Shi Guanyong¹; Zhang Ting'an¹; Zhang Hongyan¹; ¹Northeastern University

3:20 PM Break

3:40 PM

The Upper Limit of Trace Elements of Low-Grade Iron Ore Used in Sinter: *Yi Qian*¹; Jianliang Zhang¹; Kexin Jiao¹; Chao Zhang¹; ¹University of Science and Technology Beijing

4:00 PM

Comprehensive Research on Basicity and Coal Dosage of Sinter Based on Cost Analysis: Xiangwei Zheng¹; *Xuewei Lv*¹; Changyang Ji¹; Rende Zhang¹; Chengyi Ding¹; ¹Chongqing University

Additive Manufacturing: Interrelationships of Fabrication, Constitutive Relationships Targeting Performance, and Feedback to Process Control — Mechanical Properties of Additively Manufactured Metals

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; David Bourell, University of Texas at Austin; Reginald Hamilton, Pennsylvania State University; James Sears, GE Global Research Center; Allison Beese, Pennsylvania State University; Rajiv Mishra, University of North Texas

Tuesday PM March 17, 2015 Room: Northern Hemisphere A1 Location: Dolphin

Session Chairs: Larry Murr, University of Texas as El Paso; Stefan Leuders, Universitat Paderborn

2:00 PM Invited

Fatigue Life Prediction for Metals Processed by Selective Laser Melting Using Finite Element Analyses: Stefan Leuders¹; *Wadim Reschetnik*¹; Andre Riemer¹; Thomas Tröster¹; Hans Albert Richard¹; Thomas Niendorf²; ¹DMRC / University of Paderborn; ²Institute of Materials Engineering / TU Freiberg

2:30 PM

Process-Structure-Property Relationship of an Additively Manufactured Magnesium Alloy: *Kumar Kandasamy*¹; Jacob Calvert¹; ¹Aeroprobe Corporation

2:50 PM Invited

Comparative Metallurgy for Additive Manufacturing of Metal and Alloy Components by Electron Beam Melting: L. Murr¹; ¹University of Texas at El Paso

3:20 PM

Functionally Graded Ti-6Al-4V/TiB Composite Fabricated by LENS Metal Additive Manufacture: *Denver Seely*¹; Mark Horstemeyer¹; ¹Mississippi State University/Center for Advanced Vehicular Systems

3:40 PM Break

4:00 PM

Variability in Mechanical Properties of Laser Engineered Net Shaping Material: *Jay Carroll*¹; David Adams¹; Michael Maguire¹; Joseph Bishop¹; Benjamin Reedlunn¹; Bo Song¹; ¹Sandia National Laboratories

4:20 PM

Stress Rupture Behavior of P91-AISI 304 Weld Ttransition Joint Developed by Friction Surfaced Additive Manufacturing Method: Javed Akram¹; Prasad Kalvala¹; Mano Misra¹; ¹University of Utah

4:40 PM

Microstructure and Mechanical Properties of Inconel 718 Component Fabricated by CO₂ and Diode Laser Deposition: A Comparative Study: *Guru Dinda*¹; Ashish Dasgupta²; ¹Wayne State University; ²Focus HOPE

5:00 PM

Transition Microstructures and Properties in the Laser Additive Manufacturing Repair Of Monel K-500 (UNS N05500) and Toughmet 3AT (UNS C72900): *Manuel Marya*¹; Virendra Singh¹; You Lu¹; Jean-Yves Hascoet¹; Surendar Marya¹; ¹Schlumberger Technology Corporation

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Deformation Twinning

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee Program Organizers: Rodney McCabe, Los Alamos National Laboratory; John Carpenter, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Khalid Hattar, Sandia National Laboratory; Irene Beyerlein, Los Alamos National Laboratory; Wolfgang Pantleon, Technical University of Denmark

Tuesday PM	Room: Pelican 2
March 17, 2015	Location: Swan

Session Chairs: Joao Fonseca, The University of Manchester; Reeju Pokharel, Los Alamos National Laboratory

2:00 PM Invited

Probing the Onset of Twinning in Magnesium Alloys: *Matthew Barnett*¹; ¹Deakin University

2:30 PM

Microstructural Investigation of Twin Boundaries and Twin-Twin Interactions in HCP Metals Using HRTEM and In-Situ Loading: *Benjamin Morrow*¹; Rodney McCabe¹; Ellen Cerreta¹; Carlos Tomé¹; ¹Los Alamos National Laboratory

2:50 PM

In Situ Electron Microscope Characterization on the Effect of Size on The Deformation Twinning Behavior: *Qian Yu*¹; Andrew Minor²; Raj Mishra³; ¹Zhejiang University; ²UC Berkeley; ³GM

3:10 PM

Identifying Thin Compression Twins in Magnesium AZ31 Using Information from Individual Kikuchi Bands Found in EBSD Patterns: *Travis Rampton*¹; David Fullwood²; Matt Nowell¹; ¹EDAX; ²BYU

3:30 PM Break

3:50 PM

Characterization of Twin/Grain Boundary Interactions in Pure Rhenium Under Compressive Loads: Josh Kacher¹; Andrew Minor¹; ¹University of California, Berkeley

4:10 PM

Explicit Incorporation of Deformation Twinning in Crystal Plasticity Finite Element Models: *Milan Ardeljan*¹; Rodney McCabe²; Irene Beyerlein²; Marko Knezevic¹; ¹University of New Hampshire; ²Los Alamos National Laboratory

Characterization of Twinning Behavior and Corresponding Crystal Plasticity-Based Modeling in Commercial Purity Titanium: Harsha Phukan¹; Chen Zhang¹; Philip Eisenlohr¹; Leyun Wang²; Jun-Sang Park³; Peter Kenesei³; Thomas Bieler¹; David Mercier⁴; Martin Crimp¹; ¹Michigan State University; ²Institute of Materials Research, Helmholtz-Zentrum, Geesthacht; ³Advanced Photon Source, Argonne National Laboratory; ⁴Max Planck Institute fur Eisenforschung

4:50 PM

4:30 PM

Discrete Dislocation Dynamics Simulation of the Effect of Tension-Twining on the Plastic Deformation of Magnesium Crystals: Haidong Fan¹; Sylvie Aubry²; A. Arsenlis²; *Jaafar El-Awady*¹; ¹Johns Hopkins University; ²Lawrence Livermore National Laboratory

Advanced Composites for Aerospace, Marine, and Land Applications II — Advanced Composites and Syntactic Foams

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Tomoko Sano, US Army Research Laboratory; Tirumalai Srivatsan, The University of Akron

Tuesday PM	Room: Asia 5
March 17, 2015	Location: Dolphin

Session Chairs: Timothy Walter, U.S. Army Research Laboratory; Gundolf Kopp, German Aerospace Center (DLR) - Institute of Vehicle Concepts

2:00 PM

Development of Lightweight Carbon Nanofiber Reinforced Syntactic Foam Composites: Steven Eric Zeltmann¹; ¹New York University

2:20 PM

Evaluation of Syntactic Foam for Energy Absorption at Low to Moderate Loading Rates: *Timothy Walter*¹; Jennifer Sietins¹; Paul Moy¹; ¹U.S. Army Research Laboratory

2:40 PM

Study of Microstructure and Mechanical Properties of Particulate Reinforced Aluminum Matrix Composite Foam: Suresh Kumar¹; Om Pandey¹; ¹Thapar University

3:00 PM

Bio-inspired Synthesis of Lightweight, Hierarchically Structured Porous Composites by Freeze Casting: *Pang-Hsuan Lee*¹; Chih-Hsiang Chang²; Tzer-Shen Lin²; Ching-Yu Yang¹; Haw-Kai Chang¹; Po-Yu Chen¹; ¹National Tsing Hua University; ²Industrial Technology Research Institute

3:20 PM Break

3:40 PM

Atmospheric Plasma Treatment of Nylon 6,6 for Improved Interfacial Adhesion in Thermoplastic Composites: *Andres Bujanda*¹; Chi-Chin Wu¹; John Demaree¹; Jason Robinette¹; Amanda Weerasooriya¹; David Flanagan¹; Timothy Walter¹; ¹U.S. Army Research Laboratory

4:00 PM

Next Generation Car – Example of Function Integration at the Light Urban Vehicle (LUV) Vehicle Concept: *Gundolf Kopp*¹; Simon Brueckmann¹; Michael Kriescher¹; Horst Friedrich¹; ¹German Aerospace Center (DLR) – Institute of Vehicle Concepts

4:20 PM

The Synthesis and Processing of Self-Healing Materials – A Lamellar Shape Memory Alloy in Composite Structure: *Bakr Rabeeh*¹; Yasser Fouad¹; ¹German University in Cairo

Advanced Materials and Reservoir Engineering for Extreme Oil & Gas Environments II — Nanocrystalline Materials and Novel Innovations for Oil and Gas Applications II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee *Program Organizers:* Indranil Roy, Schlumberger; Xinghang Zhang, Texas A&M University; Ting Chen, West Virginia University; Greg Kusinski, Chevron; Jefferson Rodrigues, Petrobras; Hani Elshahawi, Shell Exploration & Production, Co.

Tuesday PMRoom: Swan 7March 17, 2015Location: Swan

Session Chairs: Ting Chen, University of West Virginia ; Bing Han, Schlumberger

2:00 PM Keynote

Gradient Nanostructures in Metals: *K.* Lu^1 ; ¹Institute of Metal Research, Chinese Academy of Sciences

2:25 PM Invited

Advantages of Gradient Surface Structure: *Yuntian Zhu*¹; Wu Xiaolei²; ¹North Carolina State University; ²Institute of Mechanics

2:50 PM Invited

A Combined Experimental-Simulation Study of Strain Localization in Austenitic Materials: *Diana Farkas*¹; Gary Was²; Ian Robertson³; ¹Virginia Tech; ²University of Michigan; ³University of Wisconsin

3:15 PM

High Temperature Flow Response of Severely Deformed Titanium: Seyedvahid Sajadifar¹; G. Guven Yapici¹; ¹Ozyegin University

3:35 PM Break

3:50 PM Invited

Understanding Thermal Stability of Tin-Base Solders and Its Effect on Reliability of Downhole Electronics: Ying Wang¹; Bin Li²; Yun Xi³; Yansong Wang³; Casey Anude³; *John Stevens*³; ¹Purdue University; ²Southern Methodist University; ³Baker Hughes

4:15 PM Invited

Wear Resistance of the Ti/TiC Coatings Deposited by Means of Supersonic Cold Gas Spray Technique: *Jan Kusinski*¹; Slawomir Kac¹; Paolo Matteazzi²; Alberto Colella²; Sergi Dosta³; Javier Fernandez⁴; Jorge Garcia-Forgas⁵; ¹University of Mining and Metallurgy; ²CSGI and MBN Nanomaterialia; ³Thermal Spray Centre (CPT), Universitat de Barcelona; ⁴Thermal Spray Centre (CPT), Universitat de Barcelona; ⁵ALHENIA AG

4:40 PM

Performance Mapping of Tungsten Carbide Metal Matrix Composites for Use in Severe Wear Applications: *Tonya Wolfe*¹; Thamara Silva²; Gary Fisher¹; Hani Henein³; ¹Alberta Innovates - Technology Futures; ²University of State of Minas Gerais, Brazil; ³University of Alberta

5:00 PM

Effect of Ti Addition on Microstructure and Mechanical Properties of 13Cr Super Martensitic Stainless Steel: *Yong Lian*¹; Jinfeng Huang²; Jin Zhang¹; Cheng Zhang²; Wen Gao¹; Zhimeng Guo¹; Fang Yang¹; ¹Institute of Advanced Materials and Technology, University of Science and Technology Beijing; ²State Key Laboratory for Advanced Metals and Materials, University of Science and Technology Beijing

5:20 PM

Mechanical Behaviors and Radiation Response of Nanostructured Cu/ Fe Multilayers: *Youxing Chen*¹; Engang Fu²; Yue Liu¹; Kaiyuan Yu¹; Haiyan Wang¹; Yongqiang Wang³; Xinghang Zhang¹; ¹Texas A&M University; ²Peking University; ³Los Alamos National Laboratory

5:40 PM

The Preparation of a New Biodiesel Antioxidant and Kinetic Analysis: Li She¹; ¹Kunming University of Science and Technology

Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion III — Capacitors and Dielectric Materials II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee, TMS: Magnetic Materials Committee

Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael Lanagan, Penn State University; Michael McHenry, Carnegie Mellon University; Rachael Myers-Ward, Naval Research Laboratory; Clive Randall, Penn State University; Matthew Willard, Case Western Reserve University; Ty McNutt, APEI, Inc.

Tuesday PM March 17, 2015 Room: Asbury A Location: Yacht & Beach

Session Chair: Michael Lanagan, Penn State University

2:00 PM Invited

Thin Films of Barium Oxide Based Glasses for Dielectric Material: *Charles Stutz*¹; Gregory Kozlowski²; John Jones¹; Steven Smith²; Goldstein Jonathan¹; Gerald Landis²; Chad Holbrook¹; ¹Air Force Reserch Laboratory; ²University of Dayton Research Institute

2:30 PM Invited

Development of PLZT-based Ceramic Capacitors for Power Electronics in Electric Drive Vehicles: *U. (Balu) Balachandran*¹; Beihai Ma¹; Tae Lee¹; Stephen Dorris¹; ¹Argonne National Laboratory

3:00 PM Invited

(1-x)BaTiO₃-xNaNbO₃ Complex Perovskite Relaxor Ferroelectrics for High Temperature Capacitor Applications: *Do-Kyun Kwon*¹; Yumin Goh¹; Dong Su Son¹; Baek Hyun Kim¹; ¹Korea Aerospace University

3:30 PM Break

3:50 PM

Zirconium and Calcium Modified BaTiO3 Thin Films for Electrical Energy Storage Applications: *Alvaro Instan*¹; Shojan Pavunny¹; Sudheendran Kooriyattil¹; Dhiren Pradhan¹; Ram Katiyar¹; ¹University of Puerto Rico

4:10 PM

Laminated Aluminum/Graphite Composite Roll with High Thermal Conductivity and Thermal Stress Relaxation Effect: *Yuka Yamada*¹; Hiroshi Hohjo¹; Hidehiko Kimura¹; Atsushi Kawamoto¹; Tadayoshi Matsumori¹; Tsuguo Kondoh¹; ¹Toyota Central R&D Labs, Inc.

4:30 PM

Origin of Low Frequency Noise in the Low Drain Current Range of AlGaN/GaN High-Electron-Mobility Transistors (HEMTs): *Miao Zhao*¹; ¹Key Laboratory of Microelectronics Device & Integrated Technology, Institute of Microelectronics of the Chinese Academy of Sciences

Advanced Materials in Dental and Orthopedic Applications — Session IV

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Elizabeth Trillo, Southwest Research Institue; Grant Crawford, South Dakota School of Mines and Technology

Tuesday PM	
March 17, 2015	

Room: Swan 8 Location: Swan

Session Chairs: Grant Crawford, South Dakota School of Mines and Technology ; Terry Lowe, Colorado School of Mines; Tolou Shokuhfar, Michigan Technological University

2:00 PM Invited

Nanostructured Metals for Innovation Applications in Dentistry and Orthopedics: *Ruslan Valiev*¹; Terry Lowe²; ¹Ufa State Aviation Technical University, Saint Petersburg State University; ²Colorado School of Mines

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2:30 PM

Tribocorrosion Studies on Surface Modified Medical Grade Stainless Steel: *Guohua Zhao*¹; Nuria Espallargas²; Ragnhild E. Aune²; ¹KTH Royal Institute of Technology; ²Norwegian University of Science and Technology

2:50 PM

Preparation and Evaluation of Rare-Earth Added Magnesium Alloys for Implant Applications: *Zhigang Xu*¹; Christopher Smith¹; Yongjun Chen¹; Jag Sankar¹; ¹NC A&T State University

3:10 PM

Mechanical Properties of Biocompatible Ti-13Nb-13Zr Alloys Processed by SPD: Ajit Panigrahi¹; Bartosz Sulkowski²; Thomas Waitz¹; Anton Hohenwarter³; *Michael Zehetbauer*¹; ¹University of Vienna; ²AGH University of Science and Technology; ³Montanuniversitaet Leoben

3:30 PM Break

3:50 PM Invited

Strength and Fracture Toughness of Zirconia Y-TZP Core Veneered with Aesthetic Feldspathic Ceramic: *Carlos Elias*¹; Heraldo Elias¹; Marcelo Garbossa²; Claudinei dos Santos³; ¹Instituto Militar de Engenharia; ²Universidade Veiga de Almeida; ³Universidade do Estado do Rio de Janeiro

4:20 PM

Titanium Anodic Oxidation: A Powerful Technique for Tailoring Surfaces Properties for Biomedical Applications: *Mariapia Pedeferri*¹; ¹Politecnico di Milano

4:40 PM

TUESDAY PM

Microstructure and Mechanical Properties of a Directionally Solidified Co-20 wt.% Cr Alloy for Biomedical Applications: *Ana Ramirez-Ledesma*¹; Julio Juarez-Islas¹; ¹Universidad Nacional Autonoma de Mexico

Advances in Solidification of Metallic Alloys under External Fields — Solidification under Ultrasonic Field

Sponsored by: TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS: Aluminum Committee, TMS: Solidification Committee

Program Organizers: Jiawei Mi, University of Hull; Dmitry Eskin, Brunel University

Tuesday PM	Room: Swan 1
March 17, 2015	Location: Swan

Session Chairs: Laurentiu Nastac, The University of Alabama; Sergey Komarov, Tohoku University

2:00 PM Invited

Contactless Ultrasound Generation in a Crucible: *Koulis Pericleous*¹; Valdis Bojarevics²; Georgi Djambazov²; ¹University of Greenwich; ²University of Greenwich

2:30 PM Invited

Industrial Application of Ultrasonic Vibrations to Improve the Structure of Al-Si Hypereutectic Alloys: Potential and Limitations: Sergey Komarov¹; ¹Tohoku University

3:00 PM

Application of External Fields to the Development of Aluminum-based Nanocomposite and Master Alloys: *Dmitry Eskin*¹; Nadendla Hari Babu¹; Sreekumar Vadakke Madam¹; Javier Tamayo¹; Sergey Vorozhtsov²; Alexandr Vorozhtsov²; ¹Brunel University; ²Tomsk State University

3:20 PM

Modelling the Breakup of Nanoparticle Clusters in Aluminium and Magnesium Based Metal Matrix Nanocomposites: Anton Manoylov¹; Valdis Bojarevics¹; *Koulis Pericleous*¹; ¹Centre of Numerical Modelling and Process Analysis, University of Greenwich

3:40 PM Break

4:05 PM

The Effect of External Fields and Application of Novel Dense Master Alloys to Increase the Physico-Mechanical Properties of Light Alloys: *Sergey Vorozhtsov*¹; Dmitry Eskin²; Javier Tamayo²; Alexander Vorozhtsov¹; Artem Averin³; Vladimir Promakhov¹; Anton Khrustalyov¹; ¹Tomsk State University; ²Brunel University; ³Federal Research & Production Center "Altai"

4:25 PM

Ternary Peritectic Solidification of Sn-Cu-Sb Alloy within Ultrasonic Field: *Wei Zhai*¹; Peng Fei Zuo¹; Xian Lian Zhu¹; Jia Yuan Li¹; Bingbo Wei¹; ¹Northwestern Polytechnical University

4:45 PM

The Use of Alumina and Zirconia Nanopowders for Optimization of the Al-based Light Alloys Properties: Sergey Vorozhtsov¹; *Vladimir Promakhov*¹; Dmitry Eskin²; Alexander Vorozhtsov¹; Ilya Zhukov¹; ¹Tomsk State University; ²Brunel University

5:05 PM

Grain Refinement of Pure Aluminium by Al3Ti1B Master Alloy and Ultrasonic Treatment: *Gui Wang*¹; Matthew Dargusch¹; Qian Ma²; Dmitry Eskin³; David StJohn¹; ¹The University of Queensland; ²RMIT University; ³Brunel University

Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu — Solidification Processing IV

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Laurentiu Nastac, The University of Alabama; Baicheng Liu, Tsinghua University; Hasse Fredriksson, KTH - Royal Institute of Technology; Jacques Lacaze, Université de Toulouse; Chun-Pyo Hong, Yonsei University; Adrian Catalina, Caterpillar Inc.; Andreas Buhrig-Polaczek, RWTH Aachen University; Daan Maijer, The University of British Columbia; Charles Monroe, University of Alabama at Birmingham; Adrian Sabau, Oak Ridge National Laboratory; Roxana Ruxanda, Emerson Climate Technologies; Alan Luo, The Ohio State University; Subhayu Sen, GEOCENT; Attila Diószegi, Jönköping University, School of Engineering

Tuesday PMRoom: Swan 6March 17, 2015Location: Swan

Session Chair: Attila Diószegi, Jönköping University

2:00 PM Invited

Key Roles of Impurities During Solidification of Al Alloys: Peter Schumacher¹; Jiehua Li; ¹University of Leoben

2:25 PM

High-precision Numerical Simulation for Effect of Casting Speed on Solidification of 40Cr during Continuous Billet Casting: Yanan Chen¹; ¹University of Science and Technology Beijing

2:45 PM

The Unidirectional Solidification of Ti-46Al-8Nb Alloy with BaZrO3 Coated Al2O3 Mould: *Wei Chao*¹; ¹Shanghai University

3:05 PM

Non-Metallic Ti Oxides and MnS/FeS2 Complex Precipitation in Ti-Killed Steel: *Jieyun Chen*¹; Dan Zhao¹; Huigai Li¹; Shaobo Zheng¹; ¹Shanghai University

3:25 PM Invited

CFD Modeling of Macrosegregation and Shrinkage in Large Diameter Steel Roll Castings Using the AH and MC Techniques: *Laurentiu Nastac*¹; Kevin Marsden²; ¹The University of Alabama; ²Whemco, Inc.

3:50 PM Break

4:10 PM

Prediction of Surface Porosity Defects in High Pressure Die Casting: Mahdi Saeedipour¹; Simon Schneiderbauer¹; Stefan Pirker¹; Salar Bozorgi²; *Christoph Angermeier*²; ¹Johannes Kepler University; ²Austrian Institute of Technology

4:30 PM

Engineered Cooling Process for High Strength Ductile Iron Castings: Simon Lekakh¹; Antoni Michailov¹; Joseph Kramer¹; ¹MST

4:50 PM

Macro-Segregation in Uranium-6%Niobium Castings: Robert Aikin¹; ¹Los Alamos National Laboratory

5:10 PM

Numerical Simulation of Solidification Structure for YQ450NQR1 Steel Bloom in Continuous Casting Process: Kun Dou¹; Lei Wang¹; Jiasheng Qing¹; Xiaofeng Zhang¹; Bao Wang²; Bo Liu¹; *Qing Liu¹*; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing; ²Department of Engineering, University of Leicester, UK

Advances in Thin Films for Electronics and Photonics — Functional Materials for Electronics and Photonics II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee

Program Organizers: Federico Rosei, INRS; Nuggehalli Ravindra, New Jersey Institute of Technology; Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Terry Alford, Arizona State University

Tuesday PM	Room: Europe 7
March 17, 2015	Location: Dolphin

Session Chair: Roger Narayan, NCSU

2:00 PM Invited

A Tip-Based Lithography Tool for Writing MetallicThin Film Line Patterns on Substrates by Electromigration Induced Liquid Metal Flow: *Lutz Meinshausen*¹; Benjamin Luce¹; Z Chen²; Indranath Dutta¹; ¹Washington State University; ²University of Michigan

2:30 PM Invited

Exploring Novel Plasmonic Nanostructures by Ultra-Localized Electron Probe: *Ritesh Sachan*¹; ¹Oak Ridge National Laboratory

2:55 PM

Flexible Resistive Switching Memory Device Based on Graphene Oxide Embedded with ZnO Nanorods: Geetika Khurana¹; Pankaj Misra¹; Nitu Kumar¹; Ram Katiyar¹; ¹University of Puerto Rico Rio Piedras

3:15 PM Invited

Local Microstructure in Functional Oxide Films and Microcrystals Using Spatially-Resolved Synchrotron Microdiffraction: John Budai¹; Jonathan Tischler²; T. Zac Ward¹; Christianne Beekman¹; Wolter Siemons¹; Hans Christen¹; Alexander Tselev¹; Jagdish Narayan³; ¹Oak Ridge National Laboratory; ²Argonne National Laboratory; ³North Carolina State University

3:40 PM Break

4:00 PM Invited

Microstructural Evolution of Binary Nanoparticle Systems: Michael Chandross¹; Fadi Abdeljawad¹; ¹Sandia National Laboratories

4:25 PM Invited

Upconverting Nanoparticles as Optical Nanothermometers to Study the Heat Releasing Properties of Gold Nanorods: *Fiorenzo Vetrone*¹; ¹Université du Québec

4:50 PM

Nanostructuration a Strategy for Improving the Electric Properties of MgSiSn Alloys: Angéline Poulon-Quintin¹; Pierre Lannelongue¹; Mohamed Goune¹; ¹ICMCB-CNRS

5:10 PM

Surface/Interface Structure and Optical Properties of Nanocrystalline Hafnium Oxide Thin Films: *Mirella Vargas*¹; Ramana Chintalapalle¹; ¹The University of Texas at El Paso

Alloys and Compounds for Thermoelectric and Solar Cell Applications III — Session IV

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Stéphane Gorsse, Bordeaux INP; Chih-Huang Lai, National Tsing Hua University; Yoshisato Kimura, Tokyo Institute of Technology; Ce-Wen Nan, Tsinghua University; G. Jeffrey Snyder, California Institute of Technology; Hsin-jay Wu, National Sun Yat-Sen University

Tuesday PM March 17, 2015 Room: Europe 5 Location: Dolphin

Session Chairs: Stéphane Gorsse, Institut de Chimie de la Matière Condensée de Bordeaux; Jean-Claude Tedenac, Institut de Chimie Moléculaire et des Matériaux

2:00 PM Invited

Process Scalability for Promising Si Based Thermoelectric Materials: *Christelle Navone*¹; ¹Commissariat à l'Energie Atomique et aux Energies Alternatives

2:25 PM Invited

Effect of Texture and Grain Growth on Thermoelectric Properties of Higher Manganese Silicide: Solange Vivès¹; Stéphane Gorsse¹; ¹ICMCB

2:50 PM Invited

Thermal Budget for Bulk Nanostructured Thermoelectric Compounds: Samuel Humphry-Baker¹; Christopher Schuh¹; ¹Massachusetts Institute of Technology

3:15 PM

Doping Effects (Ge, Cr, Os) on Thermoelectric Properties of Higher Manganese Silicides: Matthieu Régniere¹; Solange Vives²; Stephane Gorsse²; David R. Clarke¹; *Laetitia Laversenne*³; ¹School of Engineering and Applied Science, Harvard University; ²Institut de Chimie de la Matière Condensée de Bordeaux - CNRS; ³Univ. Grenoble Alpes, Inst NEEL and CNRS, Inst NEEL

3:35 PM Break

3:55 PM Invited

Design of Thermoelectric Materials via First Principles Calculations: *Philippe Jund*¹; Kinga Niedziolka¹; Patrick Hermet¹; Jean-Claude Tédenac¹; ¹Université Montpellier 2 - ICGM

4:20 PM Invited

Exploratory Study on Hybrid Materials for Thermoelectric Applications: *Jean-Michel Rueff*¹; Paul-Alain Jaffres²; Marion Galmiche¹; Olivier Perez¹; Bernard Nysten³; ¹CNRS - CRISMAT; ²UBO / CEMCA; ³UCL - IMCN/BSMA

4:45 PM Invited

Experimental Optimization of Thermoelectric Properties of HMS: Alexandre Berche¹; Antony Lluch¹; Solange Vivès²; Jean-Claude Tédenac¹; Stéphane Gorsse²; *Philippe Jund*¹; ¹Institut Charles Gerhardt; ²ICMCB

5:10 PM

Phase Stability of Thermoelectric Alkaline Earth Metal Borides and Silicides: Mallikharjuna Bogala¹; Ramana Reddy¹; ¹The University of Alabama

Alumina and Bauxite — Precipitation and Calcination

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Hans-Werner Schmidt, Outotec GmbH

Tuesday PM March 17, 2015

Room: Southern Hemisphere IV Location: Dolphin

Session Chair: Peter-Hans Ter Weer, TWS Services & Advice BV

2:00 PM Introductory Comments

2:05 PM

CFD Simulations of a Large-Scale Seed Precipitation Tank Stirred with Multiple Intermig Impellers: Guoquan Zhang¹; Hongliang Zhao²; Chao Lv¹; Yan Liu¹; Ting'an Zhang¹; ¹Northeastern University of China; ²University of Science & Technology Beijing

2:30 PM

Recovering Waste-Heat and Water from Alumina Calciner Gas: Yingying Liu1; Laishi Li1; Xinqin Liao1; Ruisheng Bai1; 1Shenyang Aluminum & Magnesium Engineering & Research Institute Co., Ltd.

2:55 PM

Smelter Grade Alumina (SGA) Quality in a 40+ Year Perspective – Where to from Here?: Benny Raahauge1; 1FLSmidth

3:20 PM Break

3:35 PM

Alumina Calcination - A Mature Technology under Review from Supplier Perspective: Cornelis Klett1; Linus Perander1; 1Outotec GmbH

4:00 PM

Numerical Simulation on Carbonation Reactor of Calcified Residue: Liu Yan¹; Zhang Jun¹; Li Xiaolong¹; Zhang Ting'an¹; ¹Northeastern University

4:25 PM Question and Answer Period

4:50 PM Concluding Comments

Aluminum Alloys: Development, Characterization, and Applications — Simulation and Modeling

Sponsored by: TMS Light Metals Division, TMS: Aluminum Processing Committee Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum;

Subodh Das, Phinix,LLC; Tongguang Zhai, University of Kentucky

Tuesday PM March 17, 2015 Room: Northern Hemisphere E3 Location: Dolphin

Session Chair: Grant Chen, Université du Québec à Chicoutimi

2:00 PM

Generation of Process-Structure-Property Data on a Commercial 7xxxseries Aluminum for Development of ICME Tools: Ashley Goulding¹; Richard Neu1; 1Georgia Institute of Technology

2:20 PM

Modeling Sensitization of AA5xxx Aluminum Alloys Through B-phase Precipitation Kinetics: Matthew Steiner1; Sean Agnew1; 1University of Virginia

2:40 PM

Modeling Over-Aging in Al-Mg-Si Alloys by a Multi-Phase Kampmann-Wagner Numerical Model: Qiang Du¹; ¹SINTEF

3:00 PM

Prediction of Microstructure Evolution of Direct-Chill Cast Ingots of 7075 Aluminum Alloys during Homogenization: Siamak Rafiezadeh¹; Ahmad Falahati1; Ernst Kozeschnik1; 1Vienna University of Technology

3:20 PM

Simulation of the 3D Meso-Scale Deformation of an Aluminum 6061 Semisolid Weld Pool: Hamid Reza Zareie Rajani¹; Andre Phillion¹; ¹University of British Columbia

3:40 PM Break

3:50 PM

Deformation and Failure of an Al-Mg Alloy Investigated Through Multiscale Microstructural Models: Andrew Magee¹; Leila Ladani¹; ¹The University of Connecticut

4:10 PM

Constitutive Behaviour of Aluminum B206 in the As-Cast State: Seyyed Mohammad Mohseni¹; André Phillion¹; Daan Maijer¹; ¹University of British Columbia

4:30 PM

Experimental Verification of Through-Process Modeling of Cold Spray Al Alloys: Baillie McNally1; Danielle Belsito1; Richard Sisson1; Victor Champagne2; 1Worcester Polytechnic Institute; 2U.S. Army Research Lab

4:50 PM

Load/Displacement and Energy/Displacement Performances of Aluminum and Magnesium Extrusions Subjected to Quasi-Static and Dynamic Loading Under Axial Crush and Cutting Deformation Modes: Ryan Smith1; Philipp Straßburger2; William Altenhof1; Elmar Beeh2; 1University of Windsor; ²German Aerospace Center (DLR)

5:10 PM

Estimation of Heat Transfer Coefficient in Squeeze Casting of Wrought Aluminum Alloy 7075 by the Polynomial Curve Fitting Method: Xuezhi Zhang¹; Li Fang¹; Henry Hu¹; Xueyuan Nie¹; Jimi Tjong²; ¹University of Windsor; ²Ford Powertrain Engineering Research & Development Center

Aluminum Reduction Technology — Environment II

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pascal Lavoie, LMRC

Tuesday PM March 17, 2015

Room: Southern Hemisphere III Location: Dolphin

Session Chair: Stephan Broek, Hatch Ltd

2:00 PM Introductory Comments

2:05 PM

Horizontal In-Duct Scrubbing of Sulfur Di Oxide from Flue Gas Exhausts: Rajat Ghosh1; John Smith1; Angelique Adams1; 1Alcoa, Inc.

2:30 PM

Impact of Potroom Work Practices on Roofline Fluoride Wet Scrubber Efficiency: Neal Dando1; Weizong Xu1; 1Alcoa

2:55 PM

Mobile Monitoring System for Potroom Roof HF Emissions: Frederic Potvin1; 1Morin Enertech Inc.

3:20 PM

Solution to Reduce Fluoride Emissions from Anode Butts: Guillaume Girault1; Bruno Petitjean1; Gaston Riverin1; 1Rio Tinto Alcan

3:45 PM Break

4:00 PM

Start-Up of the OZEOS Gas Treatment Center (GTC) for RTA AP 60 Phase 1: Mathieu Frainais1; Jean-Nicolas Maltais2; Philippe Martineau1; Fabienne Virieux3; 1Solios Environnement Inc; 2Rio Tinto Alcan; 3Fives Solios

4:25 PM

Treatment of Gas Emissions in Potrooms: Alain Periers1; Bassam Hureiki2; Antoine de Gromard²; Chin Lim²; Gheorghe Dobra³; Marian Cilianu³; Fabienne Virieux1; 1Fives Solios; 2Solios Environnement Sa; 3Alro

4:50 PM

Possible Use of 25 MW Thermal Energy Recovered from the Potgas at Alba Line 4: Anders Sorhuus¹; Sivert Ose¹; Bent Møller Nilsen¹; ¹Alstom

Aluminum Reduction Technology — Fundamentals Chemistry II

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pascal Lavoie, LMRC

Tuesday PMRoom: Southern Hemisphere VMarch 17, 2015Location: Dolphin

Session Chair: Alton Tabereaux, Consultant

2:00 PM Introductory Comments

2:05 PM

Behavior of Powders on the Surface of a Liquid: *Csilla Kaszás*¹; László Kiss¹; Sébastien Guérard²; Jean-François Bilodeau²; ¹Univeristé du Québec á Chicoutimi; ²Rio Tinto Alcan

2:30 PM

Development of a Mechanized Bath Sampling Method: *Antoine Molin*¹; Laszlo Kiss¹; Sándor Poncsák¹; Sébastien Guerard²; Jean-Francois Bilodeau²; ¹Universite du Quebec a Chicoutimi; ²Rio Tinto Alcan

2:55 PM

Impact of Variable Bath Chemistry and Wetting on Gas Bubble Flow in Aluminium Electrolysis Cells: Kristian Etienne Einarsrud¹; Ingo Eick²; Peter Witt³; Asbjørn Solheim⁴; Yuqing Feng³; ¹HiST; ²Hydro Aluminium Deutschland GmbH; ³CSIRO; ⁴SINTEF

3:20 PM

Study of the Structure and Thermophysical Properties of Side Ledge in Hall-Héroult Cells Operating with Modified Bath Composition: *Sándor Poncsák*¹; Laszlo Kiss¹; Alexandre Belley¹; Sébastien Guerard²; Jean-Francois Bilodeau²; ¹Universite du Quebec a Chicoutimi; ²Rio Tinto Alcan

3:45 PM Break

4:00 PM

The Performance of Aluminium Electrolysis in Cryolite Based Electrolytes Containing LiF, KF and MgF2: *Peng Cui*¹; Geir Martin Haarberg¹; ¹Norwegian University of Science and Technology

4:25 PM

Wetting between Carbon and Cryolitic Melts. Part I: Theory and Equipment: *Ana Maria Martinez*¹; Ove Paulsen¹; Asbjørn Solheim¹; Henrik Gudbrandsen¹; Ingo Eick²; ¹SINTEF; ²Hydro Aluminium

4:50 PM

Wetting between Carbon and Cryolitic Melts. Part II: Effect of Bath Properties and Polarisation: *Asbjorn Solheim*¹; Henrik Gudbrandsen¹; Ana Maria Martinez¹; Kristian Trætli-Einarsrud²; Ingo Eick³; ¹SINTEF; ²HiST; ³Hydro Aluminium

Biological Materials Science Symposium — Biomimetic Systems II

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Kalpana Katti, North Dakota State University; Rajendra Kasinath, DePuy Synthes Products, LLC; Michael Porter, Clemson University; Francois Barthelat, McGill University

Tuesday PM	Room: Swan 9
March 17, 2015	Location: Swan

Session Chairs: Rajendra Kasinath, DePuy Synthes Products, LLC; Kalpana Katti, North Dakota State University

2:00 PM Invited

Strength and Toughness of Nacre: Contributions of Minineral and Organic Components: Marc Meyers¹; Maria Lopez¹; Wen Yang²; ¹UCSD; ²ETH Zurich

2:30 PM

Structural Analysis of the Woodpecker Tongue: *Jae-Young Jung*¹; Eric Bushong¹; Vincent Sherman¹; Esther Cory¹; Mark Ellisman¹; Marc Meyers¹; Joanna McKittrick¹; ¹University of California, San Diego

2:50 PM Invited

Retaining Catalytic Mimetics of Cerium Oxide Nanoparticle Post Ion Interaction: Rameech McCormack¹; Priscilla Mendez¹; Swetha Barkam¹; Craig Neal¹; Soumen Das²; *Sudipta Seal*³; ¹UCF/AMPAC; ²UCF/NSTC; ³UCF/NSTC/AMPAC

3:20 PM

Teleost Fish Scales Amongst the Toughest Collagenous Materials: Ahmad Khayer Dastjerdi¹; *Francois Barthelat*¹; ¹McGill University

3:40 PM Break

3:50 PM

Systematic Design of Bio-Inspired Materials: Exploring Synergies between Micro-Architecture and Interfaces for Simultaneous Stiffness, Strength and Toughness: Mohammad Mirkhalaf¹; *Francois Barthelat*¹; ¹McGill University

4:10 PM Invited

Bioinspired Materials by Freeze Casting: Ulrike Wegst¹; ¹Dartmouth College

4:40 PM

Extraordinary Tear Resistance of Skin: *Wen Yang*¹; Vincent Sherman¹; Bernd Gludovatz²; Eric Schaible²; Polite Stewart²; Robert Ritchie²; Marc Meyers¹; ¹University of California, San Diego; ²Lawrence Berkeley National Laboratory

5:00 PM

Design and Optimization of Polymer Gels to Replicate Impact Energy Dissipation of Biological Tissues: *Bo Qing*¹; Krystyn Van Vliet¹; ¹Massachusetts Institute of Technology

Bulk Metallic Glasses XII — Structures and Mechanical Properties II

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Hahn Choo, Univ of Tennessee; Yanfei Gao, University of Tennessee

Tuesday PM	Room: Asia 4
March 17, 2015	Location: Dolphin

Session Chairs: Jamie Kruzic, Oregon State University; Koichi Tsuchiya, NIMS

2:00 PM Keynote

On the Contrasting Role of Bending vs. Tension on the Fracture Toughness of Metallic Glasses: Bernd Gludovatz¹; Jamie Kruzic²; Marios Demetriou³; William Johnson³; *Robert Ritchie*¹; ¹Lawrence Berkeley National Laboratory; ²Oregon State University; ³California Institute of Technology

2:30 PM Invited

Beta Relaxation and Low Temperature Aging of a Gold Based Bulk Metallic Glass: *Jamie Kruzic*¹; Zachary Evenson²; Steven Naleway¹; Shuai Wei³; Oliver Gross³; Isabella Gallino³; Ralf Busch³; ¹Oregon State University; ²German Aerospace Center; ³Saarland University

2:55 PM Invited

Effective Medium Elasticity of Metallic Glasses: Arka Roy¹; Kamran Karimi¹; *Craig Maloney*¹; ¹Carnegie Mellon University / Civil & Environmental Engineering

3:20 PM Invited

Fracture Toughness of Thin Film Metallic Glasses: A Comparison Study: Chia-Lin Li¹; Wahyu Diyatmika¹; C. M. Lee¹; Chia-chi Yu¹; *Jinn Chu*¹; ¹National Taiwan University of Science and Technology

3:45 PM Break

4:00 PM Invited

Mechanical Response of Zr-based BMG after Mechanical Rejuvenation by High-Pressure Torsion: Koichi Tsuchiya1; Fanqiang Meng2; Yoshihiko Yokoyama³; Karin Dahmen⁴; Peter Liaw⁵; ¹NIMS; ²Iowa State University; ³Tohoku Univ.; ⁴Univ. Illinois Urbana-Champaign; ⁵University of Tennessee Knoxville

4:20 PM Invited

Quantification of Nanoscale Metastable Phases in Amorphous Alloys: Dong Ma1; Alexandru D. Stoica1; 10RNL

4:40 PM Invited

Soft Spots in a Metallic Glass: GUMs as a Structural Signature of Liquid-Like Regions: Evan Ma1; ¹Johns Hopkins University

5:00 PM

Nonlinearity of Elastic Moduli during Compression of the Zr-Based BMG: Przemyslaw Witczak1; Zbigniew Witczak1; Wojciech Dmowski2; Yang Tong²; Yoshihiko Yokoyama³; Takeshi Egami⁴; ¹Polish Academy of Sciences; ²University of Tennessee; ³Tohoku University; ⁴Oak Ridge National Laboratory

5:20 PM

Configurational and Vibrational Entropy in Amorphous Copper Zirconium: Hillary Smith1; Chen Li2; Glenn Garrett1; Andrew Hoff1; Marios Demetriou¹; Matthew Stone²; Douglas Abernathy²; Brent Fultz¹; ¹California Institute of Technology; 2Oak Ridge National Laboratory

CALPHAD-Based ICME Research for Materials Genomic Design — Materials Genome: ICME and CALPHAD-Based Materials Design 3

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials **Engineering Committee**

Program Organizers: Wei Xiong, Northwestern University; Shihkang Lin, National Cheng Kung University; Chao Jiang, Thermo-Calc Software Inc; Shenyang Hu, Pacific Northwest National Laboratory; Wen-dung Hsu, National Cheng Kung University; Sinn-wen Chen, National Tsinghua University; Shuanglin Chen, CompuTherm LLC

Tuesday PM	Room: Northern Hemisphere A2
March 17, 2015	Location: Dolphin

Session Chairs: Shengyang Hu, Pacific Northwest National Laboratory; Xiao-Gang Lu, Shanghai University; Shuanglin Chen, CompuTherm LLC; Eric Lass, NIST

2:00 PM Kevnote

Phase Stability of γ ' (L12) Compound and Design for Alloy Development: Kiyohito Ishida1; 1Tohoku University

2:35 PM Keynote

ICME Approach to Design of Novel Microstructures for Ti-Alloys: Dong Wang1; Yufeng Zheng2; Rajarshi Banerjee3; Hamish Fraser2; Yunzhi Wang2; ¹Xi'an Jiao Tong University; ²Ohio State University; ³University of North Texas

3:10 PM

Thermodynamic Stability of NiAs-Type MnBi Phase by Addition of Sb: Hiroshi Ohtani¹; Masanori Enoki¹; ¹Tohoku University

3:30 PM Break

3:45 PM

Calculation of 3D Phase Diagrams: Shuanglin Chen¹; Weisheng Cao¹; Fan Zhang¹; Chuan Zhang¹; Jun Zhu¹; ¹CompuTherm, LLC

4:05 PM Invited

Coupling of CALPHAD Data to Multi-Phase-Field Simulations of Microstructure Evolution in Technical Alloy Systems: Markus Apel¹; Ralph Altenfeld¹; Ralf Berger¹; Bernd Böttger¹; Janin Eiken¹; Gottfried Laschet¹; Georg Schmitz1; Alexandre Viardin1; 1Access e.V.

4:35 PM

DICTRA Multiphase Moving Phase Boundary Simulations Under Local Equilibrium Conditions: Henrik Larsson1; 1Thermo-Calc Software

4:55 PM

An Integrated Atomistics-CALPHAD Framework for Modeling the NaCl-KCI-ZnCI2-AICI3 Quaternary System: Venkateswara Rao Manga1; Stefan Bringuier¹; Pierre Deymier¹; Krishna Muralidharan¹; ¹University of Arizona

Cast Shop for Aluminum Production — Metal Treatment, Alloying, and Grain Refinement

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pete Forakis, STAS Middle East

Tuesday PM	Room: Northern Hemisphere E4
March 17, 2015	Location: Dolphin

Session Chairs: Corleen Chesonis, Alcoa Technical Center; Edward Williams, Alcoa Technical Center

2:00 PM Introductory Comments

2:05 PM

Recent Progress with Development of a Multi Stage Filtration System Employing a Cyclone: John Courtenay¹; Marcel Rosefort²; ¹MQP Limited; ²Trimet Aluminium SE

2:30 PM

Effect of Electromagnetic Fields on the Priming of High Grade Ceramic Foam Filters (CFF) with Liquid Aluminum: Robert Fritzsch¹; Mark Kennedy1; Shahin Akbarnejad2; Ragnhild Aune1; 1Norwegian University of Science and Technology; 2Royal Institute of Technology

2:55 PM

Practical Use of MetalVision Ultrasonic Inclusion Analyzer: Dawid Smith1; Brett Hixson1; Hugh Mountford2; Iain Sommerville2; 1JWAluminum; ²MetalVision Manufacturing (Canada)

3:20 PM

Ultrasonic Degassing and Processing of Aluminum Part II: Victor Rundquist¹; Kiran Manchiraju¹; Qingyou Han²; ¹Southwire Company; ²Purdue University

3:45 PM Break

4:00 PM

An Investigation on Permeability of Ceramic Foam Filters (CFF): Shahin Akbarnejad¹; Robert Fritzsch²; Mark Kennedy²; Ragnhild Aune²; ¹Royal Institute of Technology (KTH); ²Norwegian University of Science and Technology (NTNU)

4:25 PM

Assessment of Modification Level in EN AC-46000 Aluminum Casting Alloys Using Thermal Analysis and Microscopic Evaluation: Mohammadreza Zamani¹; Salem Seifeddine¹; ¹Jönköping University, School of Engineering

Characterization of Minerals, Metals, and Materials — Characterization of Composites

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chenguang Bai, Chongqing University; Juan Pablo Escobedo, University of New South Wales; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Neves Monteiro, Military Institute of Engineering, IME, Materials Science Department; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal; Jian Li, CanmetMATERIALS

Tuesday PM March 17, 2015 Room: Mockingbird 1 Location: Swan

Session Chairs: Frederico Margem, UENF; Jean Margem, UENF

2:00 PM

Bending Mechanical Behavior of Polyester Matrix Reinforced with Fique Fiber: Giulio Altoé¹; *Frederico Margem*¹; Sérgio Monteiro¹; Pedro Netto¹; André Gomes¹; Mariana Barcelos¹; ¹State University of the Northern Rio de Janeiro - UENF

2:20 PM

Understanding the Behaviour of Abradable Coatings Using X-ray Micro Computer Tomography: Daniel Moyle¹; Matt Hancock²; Glen Pattinson²; Richard Johnston¹; ¹Swansea University; ²Rolls-Royce plc

2:40 PM

Unloading-Rate Dependent Amorphization in Si Phase in Reaction Bonded Ceramic Composite: *Alison Trachet*¹; Ghatu Subhash¹; ¹University of Florida

3:00 PM

Weibull Analysis of the Behavior on Tensile Strength of Hemp Fibers for Different Intervals of Fiber Diameters: Lázaro Rohen¹; Sérgio Monteiro²; Frederico Margem¹; Carlos Maurício Vieira¹; Rafael de Castro³; Gustavo Borges⁴; Anna Carolina Neves¹; Maycon Gomes⁵; ¹State University of Northern of Rio de Janeiro; ²Instituto Militar de Engenharia; ³Isecensa; ⁴Redentor; ⁵Instituto Federal Fluminense

3:20 PM

Development of Artificial Stone Using Particulate Glass Waste: *Lucas Martins*¹; Carlos Mauricio Vieira¹; Sérgio Monteiro¹; ¹UENF

3:40 PM Break

3:50 PM

Preparation and Characterization of Natural Rubber/Organophilic Clay Nanocomposites: *Marcos Fernandes*¹; Fabio Esper²; Maria das Graças Valenzuela³; Guillermo Martín Cortés³; Francisco Diaz¹; Hélio Wiebeck¹; ¹Universidade de São Paulo/PMT; ²FMU; ³Centro Universitário Estácio Radial

4:10 PM

Tensile Properties of Epoxy Composites Reinforced with Continuous PALF Fibers: *Gabriel Glória*¹; Giulio Altoé¹; Frederico Margem¹; Sérgio Monteiro²; Ygor Moraes¹; Maria Teles¹; Pedro Netto¹; ¹State University of the Northern Rio de Janeiro; ²Instituto Militar de Engenharia

4:30 PM

Replacement of Carbon-Black on Natural Rubber Composites and Nanocomposites – Part 1: *Guillermo Martín-Cortés*¹; Fabio Esper¹; Antonio Santana de Araujo¹; Wildor Hennies²; Maria Silva Valenzuela²; Francisco Valenzuela-Díaz²; ¹Universidade Estácio de Sá; ²University of São Paulo

4:50 PM

Flexural Mechanical Characterization of Epoxy Composites Reinforced with Continuous Banana Fibers: *Foluke Salgado*¹; Pedro Netto¹; Frederico Margem¹; Sergio Monteiro²; Romulo Loiola¹; ¹State University of the Northern Rio de Janeiro; ²Military Institute Engineering

Characterization of Minerals, Metals, and Materials — Characterization of Material Processing and Corrosion

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee Program Organizers: John Carpenter, Los Alamos National

Laboratory; Chenguang Bai, Chongqing University; Juan Pablo Escobedo, University of New South Wales; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Neves Monteiro, Military Institute of Engineering, IME, Materials Science Department; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal; Jian Li, CanmetMATERIALS

Tuesday PMRoom: Macaw 2March 17, 2015Location: Swan

Session Chairs: Wenjing Li, Atomic Energy of Canada Limited; Florian Nurnberger, Leibniz Universitat Hannover

2:00 PM

Comparison of the Mechanisms of Voids Formation by Plastic Deformation in Single- and Dual-Phase bcc- Steels: Gregory Gerstein¹; Hans Besserer¹; *Florian Nürnberger*¹; Hans Jürgen Maier¹; ¹Leibniz Universität Hannover

2:20 PM

Analysis of Microstructural Performance in the Hot Forging Process: Luana de Costa¹; Lirio Schaeffer¹; ¹Federal University of Rio Grande do Sul - UFRGS

2:40 PM

Characterization of Sintering Dust, Blast Furnace Dust and Carbon Steel Electric Arc Furnace Dust: *Feng Chang*¹; Shengli Wu¹; Fengjie Zhang¹; Hua Lu¹; Kaiping Du¹; ¹School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing

3:00 PM

The Effect of MgO Content in BOF Slag on Dephosphorization of Molten Steel: *Gujun Chen*¹; Shengping He¹; Yintao Guo¹; Qian Wang¹; ¹Chongqing University

3:20 PM

Influence of Mineralogical Characteristics of Iron Ore on Formation and Flow of Liquid Phase: *Bo Su*¹; Sheng-li Wu¹; Guo-liang Zhang¹; ¹School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing

3:40 PM Break

3:50 PM

Effect of Pressure on the Corrosion of Materials in High Temperature Water: *Wenjing Li*¹; OnTing Woo¹; Dave Guzonas¹; Jian Li²; Xiao Huang³; Rainier Sanchez³; Cathy Bibby⁴; ¹Atomic Energy of Canada Limited; ²CanmetMATERIALS ; ³Carleton University; ⁴CanmetMATERIALS

4:10 PM

Wide Beam Laser Remelted Hot Dip Galvanizing Al-Zn-Mg-Si Coating: *Matjaz Godec*¹; Bojan Podgornik¹; David Nolan²; ¹Institute of Metals and Technology; ²Bluescope Steel

4:30 PM

Evaluation of Cr- and Cr Free Surface Corrosion Inhibitors: Maribel De la Garza Garza¹; *Nelson Garza-Montes-de-Oca*¹; Mayra Rodriguez¹; Antonio Mani²; ¹FIME, UANL; ²Ternium

4:50 PM

The Effect of Strain Reversal during High Pressure Torsion on the Microstructure Evolution and Texture of Aluminum Alloys: *Kanwal Chadha*¹; Pinaki Bhattacharjee²; Mohammad Jahazi¹; ¹ETS; ²Indian Institute of Technology Hyderabad

TUESDAY PM

5:10 PM

Evaluation of Structural Clay Brick Masonry Units by Weibull Analysis and Brazilian Code and Specifications: Neila Azeredo¹; Afonso Azevedo²; Jonas Alexandre²; Gustavo Xavier²; Sergio Monteiro³; Euzébio Zanelato²; Rafael Oliveira²; ¹IFF; ²UENF; ³IME

Computational Modeling and Stochastic Methods for Materials Discovery and Properties Computational Materials Design I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Dallas Trinkle, University of Illinois at Urbana-Champaign; Mikhail Mendelev, Ames Laboratory; Adri van Duin, Pennsylvania State University

Tuesday PM	Room: Northern Hemisphere A4
March 17, 2015	Location: Dolphin

Session Chairs: Vidvuds Ozolins, University of California, Los Angeles; Christopher Iacovella, Vanderbilt University

2:00 PM Invited

Computational Design of Earth-Abundant Thermoelectrics: Vidvuds Ozolins1; Fei Zhou2; Weston Nielson1; Yi Xia1; Michele Nielsen3; Joseph Heremans³; Xu Lu⁴; Donald Morelli⁴; ¹University of California, Los Angeles; ²Lawrence Livermore National Laboratory; ³The Ohio State University; ⁴Michigan State University

2:30 PM

Quantifying Experimental Characterization Choices in Optimal Learning and Materials Design: Kristofer Reyes1; Si Chen1; Yan Li1; Warren Powell1; ¹Princeton University

2:50 PM

Global Optimization Improves Molecular Packing, Molecular Properties and Reactive Force Fields: Mark Dittner¹; Johannes Dieterich¹; Hasan Aktulga²; Bernd Hartke¹; ¹Christian-Albrechts-Universität Kiel; ²Michigan State University

3:10 PM

Novel Fast Cluster Expansion Method for Arbitrary Finite and Infinite Geometries: Jesper Kristensen¹; Nicholas Zabaras²; ¹Cornell University; ²University of Warwick

3:30 PM Break

3:45 PM

Accelerating Materials Discovery with Machine Learning: Logan Ward¹; Vinay Hegde1; Christopher Wolverton1; 1Northwestern University

4:05 PM Invited

Application of Concepts from Modeling Integrated Computing for the Design of Soft Materials: Christopher Iacovella¹; Gergely Varga¹; Janos Sallai1; Akos Ledeczi1; Clare McCabe1; Peter Cummings1; 1Vanderbilt University

4:35 PM

Microstructural Optimization of High Temperature Ni-Cr ODS Alloy Using Genetic Algorithm: Aniket Dutt¹; Somayeh Pasebani²; Indrajit Charit²; Rajiv Mishra¹; ¹University of North Texas; ²University of Idaho

4:55 PM

Computational Materials Design via the Inductive Design Exploration Method (IDEM): Brett Ellis1; David McDowell2; 1Exponent; 2Georgia Institute of Technology

Computational Thermodynamics and Kinetics — **Interfaces and Surfaces**

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Maryam Ghazisaeidi, The Ohio-State University; Vidvuds Ozolins, University of California Los Angeles

Tuesday PM	Room: Oceanic 3
March 17, 2015	Location: Dolphin

Session Chairs: Francesca Tavazza, National Institute of Standards and Technology; Susan Sinnott, University of Florida

2:00 PM

Atomistic Simulation and Virtual Diffraction Characterization of Homophase and Heterophase Alumina Interfaces: Douglas Spearot¹; Shawn Coleman1; 1University of Arkansas

2:20 PM

A Mechanistic Study of the Interaction Among C, N and the Ti3O5(100) Surface Based on Density Functional Theory: Hong Zhong¹; Liangying Wen¹; Chong Zou¹; Shengfu Zhang¹; Chenguang Bai¹; Feng Lu¹; ¹ChongQing University

2:40 PM

Diffuse-interface Modeling of Crystallization in Organic Thin Films: Alta Fang¹; Mikko Haataja¹; ¹Princeton University

3:00 PM Invited

Applications of Charge Optimized Many-Body (COMB) Potentials to Problems in Surface and Interface Chemistry: Susan Sinnott¹; ¹University of Florida

3:30 PM

Dependence of Solid-Liquid Interface Free Energy on Liquid Structure: Seth Wilsom¹; Mikhail Mendelev¹; ¹Ames Laboratory

3:50 PM Break

4:05 PM

Anisotropy of the Solid-Liquid Interface Properties of the Ni-Zr B33 Phase: Seth Wilsom¹; Mikhail Mendelev¹; ¹Ames Laboratory

4:25 PM

From Coherent to Incoherent Mismatched Interfaces: A Generalized Continuum Formulation of Surface Stresses: Remi Dingreville¹; Abdelmakel Hallil²; Stephane Berbenni³; ¹Sandia National Laboratories; ²Universite de La Rochelle; ³Universite de Lorraine

4:45 PM

Al/Al2O3: Coherent Interfaces and Misfit Accommodation: Xiang-Yang Liu¹; Ghanshyam Pilania¹; Steven Valone¹; Richard Hoagland¹; Barend Thijsse²; Ivan Lazic2; 1Los Alamos National Lab; 2Delft University of Technology

5:05 PM

Effect of Alloying with Transitional Metals on the Deformation and Brittle-Ductile Behavior of bcc Fe and the Strength of Fe/MC (M=Ti, V, Nb, Mo) Interfaces: Oleg Kontsevoi¹; Arthur Freeman¹; Gregory Olson¹; ¹Northwestern University

5:25 PM

Modeling Molten Particle Impact on Solid Surfaces: Edmund Webb1; ¹Lehigh University

Constitutive Response and Modeling of Structural Materials: An SMD Symposium in Honor of G.T. Gray III's 60th Birthday — Novel Dynamic and Extreme Testing Techniques

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Neil Bourne, University of Manchester; Eric Brown, Los Alamos National Laboratory; James Williams, Ohio State University; Kenneth Vecchio, University of California- San Diego

Tuesday PM	Room: Asia 2
March 17, 2015	Location: Dolphin

Session Chairs: Saryu Fensin, Los Alamos National Laboratory; Jeremy Millett, AWE

2:00 PM Invited

Materials Response Under Extremes: *Marc Meyers*¹; Bruce Remington²; Tane Remington¹; Eduardo Bringa³; Shiteng Zhao¹; Eric Hahn¹; Bimal Kad¹; Carlos Ruestes³; ¹University of California San Diego; ²Lawrence Livermore National Laboratory; ³University of Cuyo

2:20 PM Invited

Development and Application of an Explosively Driven Two Shockwave Physics Tool Targeted At Ejecta Measurements and Ejecta Model Development: *William Buttler*¹; David Oro¹; Russell Olson¹; Frank Cherne¹; James Hammerberg¹; Robert Hixson¹; Shabnam Monfared¹; Cora Pack¹; Joseph Stone¹; Guillermo Terrones¹; ¹Los Alamos National Laboratory

2:40 PM Cancelled

New Regimes of Plastic Flow in BCC Metals at Extreme Conditions of Pressure and Strain Rate: *Bruce Remington*¹; ¹Lawrence Livermore National Laboratory

3:00 PM

Compression of Single Crystal and Polycrystalline Tantalum from Low to High Strain-Rates: *Glenn Whiteman*¹; Jeremy Millett¹; Simon Case¹; Alex Worley²; ¹AWE; ²Imperial College London

3:20 PM Invited

Optical Properties of Lithium Fluoride under Extreme Stress and Strain-Rate Conditions: *Paulo Rigg*¹; Marcus Knudson²; Robert Scharff¹; Robert Hixson¹; ¹Los Alamos National Laboratory; ²Sandia National Laboratories, New Mexico

3:40 PM Break

4:00 PM

The Effect of Microstructure on Rayleigh-Taylor Instability Growth in Solids: Russell Olson¹; Ellen Cerreta; Christopher Morris¹; Adam Montoya¹; Fesseha Mariam¹; Alexander Saunders¹; *Eric Brown*; George Gray; John Bingert; ¹Los Alamos National Laboratory

4:20 PM Invited

The Mechanical and Optical Response of Polychlorotrifluoroethylene during One-Dimensional Shock Loading: *Jeremy Millett*¹; Michael Lowe¹; Gareth Appleby-Thomas²; Andrew Roberts²; ¹AWE; ²Cranfield Defence and Security

4:40 PM Invited

Deformation Behavior of Binary Magnesium Alloys Under Dynamic Loading: *Toshiji Mukai*¹; Hidetoshi Somekawa²; ¹Kobe University; ²National Institute for Materials Science

5:00 PM

Shock Induced Amorphization in Monocrystalline Silicon: *Shiteng Zhao*¹; Eric Hahn¹; Tane Remington¹; Bruce Remington²; Christopher Wehrenberg²; Eduardo Bringa³; Bimal Kad¹; Marc Meyers¹; ¹University of California, San Diego; ²Lawrence Livermore National Laboratory; ³Universidad Nacional de Cuyo

5:20 PM

Effect of Temperature on the Precursor Wave Amplitude of Al and Ta Under Laser-Induced Shock Loading: *Jeffrey Florando*¹; Ryan Austin¹; Laura Chen²; James Hawreliak¹; Amy Lazicki¹; Damian Swift¹; Mukul Kumar¹; ¹Lawrence Livermore National Laboratory; ²Imperial College

5:40 PM

Characterization of Sheet Metal Yield Surfaces using Hydrostatic Bulging with Elliptical Dies: Kevin Boyle¹; Bruce Williams¹; Daniel Green²; ¹CanmetMATERIALS; ²University of Windsor

6:00 PM

Wave Propagation and Dispersion in Elasto-Plastic Microstructured Materials: *Remi Dingreville*¹; Joshua Robbins¹; Thomas Voth¹; ¹Sandia National Laboratories

Development of "Weak Links" during the Processing of Metallic Materials — Joining and Bonding

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Lee Semiatin, US Air Force Research Laboratory; Anthony Rollett, Carnegie Mellon University; Thomas Bieler, Michigan State University; Mark Stoudt, National Institute of Standards and Technology

Tuesday PM	Room: Peacock
March 17, 2015	Location: Swan

Session Chairs: Adam Pilchak, Air Force Research Laboratory; Lee Semiatin, US Air Force Research Laboratory

2:00 PM Invited

Evolution of Microstructural Heterogeneities during Solid-State Joining of Structural Metals: *Sudarsanam Babu*¹; ¹The University of Tennessee, Knoxville

2:30 PM Invited

Defects and Microstructural Inhomogeneity in Friction Stir Welding and Processing: *Rajiv Mishra*¹; ¹University of North Texas

3:00 PM Invited

Interpretations of Microstructure and Defect Formation during Solid-State Welding of Titanium Alloys: *Thomas Broderick*¹; ¹GE Aviation

3:30 PM Break

3:45 PM Invited

Defects Developed during Superplastic Forming and Diffusion Bonding of Titanium Components: Daniel Sanders¹; ¹Boeing

4:15 PM

Dynamic Recrystallization and Physical Simulation of High Frequency Welding: Lesley Frame¹; Yoni Adonyi²; ¹Thermatool Corp.; ²LeTourneau University

4:35 PM

Strain Localization in Plastically Anisotropic Metallic Nanolaminates: *Thomas Nizolek*¹; Rodney McCabe²; Jaclyn Avallone¹; William Mook³; Nathan Mara⁴; Irene Beyerlein⁵; Tresa Pollock¹; ¹University of California Santa Barbara; ²MST-6, Los Alamos National Laboratory; ³Center for Integrated Nanotechnologies, Sandia National Laboratories; ⁴Materials Physics and Applications Division, Los Alamos National Laboratory; ⁵Theoretical Division, Los Alamos National Laboratory

4:55 PM

Microstructure and Phase Changes during Cold Rolling and Folding of Metallic Multilayers: *Rainer Hebert*¹; ¹University of Connecticut **TUESDAY PM**

Drying, Roasting, and Calcining of Minerals — Roasting

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizer: Thomas Battle, Midrex Technologies

Tuesday PMRoom: Grand Harbor Salon 3March 17, 2015Location: Yacht & Beach

Session Chairs: Boyd Davis, Kingston Process Metallurgy Inc.; Sergio Sanchez-Segado, University of Leeds

2:00 PM

Sulfation Roasting of a Bornite Flotation Concentrate to Optimize Silver Extraction in a Ferric Chloride Leach: *Ryan Foy*¹; Steve Lloyd²; Jerome Downey³; Brandon Steinborn⁴; ¹Montana Tech; ²Troy Mine, Inc.; ³Montana Tech; ⁴Freeport-McMoRan, Inc.

2:20 PM

Chlorination Roasting of Rare Earth Element Oxides: *Dan Gaede*¹; Bryce Ruffier¹; Jerome Downey¹; Larry Twidwell¹; Jannette Chorney¹; Ryan Foy¹; Katelyn Lyons¹; ¹Montana Tech

2:40 PM

Bromination Roasting of Rare Earth Element Oxides: *Bryce Ruffier*¹; Dan Gaede¹; Jerome Downey¹; Larry Twidwell¹; Jannette Chorney¹; Ryan Foy¹; Katelyn Lyons¹; ¹Montana Tech

3:00 PM

The Advantages of Thermal Analysis Prior to Bench Scale Roasting: *Tyler Salisbury*¹; Jesse White¹; ¹Hazen Research, Inc

3:20 PM

Roasting of Zinc Sulfide Concentrates in Fluidized Bed Furnace: *Boyan Boyanov*¹; Alexander Peltekov¹; ¹University of Plovdiv

3:40 PM Break

4:00 PM

Extraction of Indium from Zinc Oxide Flue Dust by Microwave Sulfation Roasting and Water Leaching: *Jun Chang*¹; Jin-hui Peng¹; Li-bo Zhang¹; Jing Chen²; ¹Faculty of Metallurgical and Energy Engineering, Kunming University of Science and Technology; ²School of Chemical Science and Technology, Yunnan University

4:20 PM

Behavior of Arsenic, Antimony and Bismuth at Roasting Temperatures: *Rafael Padilla*¹; Maria Ruiz¹; ¹University of Concepcion

4:40 PM

Characterization of Physico-Chemical Changes during the Alkali Roasting of Niobium and Tantalum Oxides: *Sergio Sanchez-Segado*¹; Ahmad Fahmi Ruzaidi¹; Yuan Zhang¹; Animesh Jha¹; ¹University of Leeds

5:00 PM

Mechanism of Na2SO4 on Refractory Gold Concentrate at Roasting Pretreatment: Li Qian¹; Jianjun Hu¹; *Yongbin Yang*¹; Bin Xu¹; Tao Jiang¹; ¹Central South University

Dynamic Probing of Microstructure Evolution in Nanostructured Materials — Size Effect and Fracture/Fatigue Studies

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee *Program Organizers:* Nan Li, Los Alamos National Laboratory; Caizhi Zhou, Missouri University of Science and Technology; Dan Gianola, University of Pennsylvania; Marc Legros, CEMES-CNRS

Tuesday PM March 17, 2015 Room: Mockingbird 2 Location: Swan

Session Chairs: Shuai Shao, Los Alamos National Laboratory; III Ryu, Brown University

2:00 PM Invited

Dynamic TEM Observations of Grain Rotation via Climb of Grain Boundary Dislocations in Nanocrystalline Platinum: *Evan Ma*¹; ¹Johns Hopkins University

2:30 PM

Approaching Stabilized Plasticity in Ultrahigh Strength Crystals: In-Situ TEM Study of Submicron Al Pillars: *Tao Hu*¹; Lin Jiang¹; Hanry Yang¹; Kaka Ma¹; Troy Topping¹; Joshua Yee¹; Meijuan Li²; Amiya Mukherjee¹; Julie Schoenung¹; Enrique Lavernia¹; ¹University of California, Davis; ²Wuhan University of Technology

2:50 PM Invited

Size Dependent Strain Rate Sensitivity of Submicron-Sized Single Crystal Iron and Aluminum Pillars: Zhiwei Shan¹; ¹Xi'an Jiaotong University

3:20 PM

Modeling Plasticity of FCC/BCC Micro-Pillars under Torsion Using Dislocation Dynamics: *Ill Ryu*¹; Wei Cai²; William Nix²; Huajian Gao¹; ¹Brown University; ²Stanford University

3:40 PM Break

4:00 PM Invited

In-Situ TEM Studies of Fracture in Nanoscale Multilayer Films: Andreas Kelling¹; Hans-Ulrich Krebs¹; *Cynthia Volkert*¹; ¹University of Göttingen

4:30 PM Invited

Fatigue Induced Microstructure Evolution in Nanotwinned Cu and thin Films in the HCF and VHCF Regime: *Chris Eberl*¹; ¹Fraunhofer IWM

5:00 PM

The Fracture Properties of Gold Thin Films Investigated by Bulge Testing: Benoit Merle¹; Eva Preiß¹; Mathias Göken¹; ¹University Erlangen-Nürnberg

5:20 PM

In-situ TEM Fatigue and Stress Relaxation in Ultrathin Nanocrystalline Films: Ehsan Hosseinian¹; Marc Legros²; *Olivier Pierron*¹; ¹Georgia Institute of Technology; ²CEMES-CNRS

Electrode Technology for Aluminum Production — Anode Properties

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Arne Ratvik, SINTEF

Tuesday PM March 17, 2015 Room: Southern Hemisphere II Location: Dolphin

Session Chairs: Mario Fafard, Laval University; Houshang Alamdari, Laval University

2:00 PM Introductory Comments

2:05 PM

Evaluating the Crack Resistance of Carbon Anodes - Implementation of a Measurement System for Tensile Strength and Fracture Toughness: *Dag Herman Andersen*¹; Hogne Linga¹; ¹Hydro Primary Metal Technology

2:30 PM

Comparison of Linear Multivariable, Partial Least Square Regression, and Artificial Neural Network Analyses to Study the Effect of Different Parameters on Anode Properties: *Dipankar Bhattacharyay*¹; Duygu Kocaefe¹; Yasar Kocaefe¹; Brigitte Morais²; ¹University of Quebec at Chicoutimi; ²Aluminerie Alouette Inc.

2:55 PM

Factors Influencing Baked Anode Properties: *Khalil Khaji*¹; Mohammed Al Qassemi¹; ¹Emirates Aluminium

3:20 PM

Spatial Methods for Characterising Carbon Anodes for Aluminium Production: *Camilla Sommerseth*¹; Rebecca Thorne¹; Stein Rorvik²; Espen Sandnes³; Arne Ratvik²; Lorentz Lossius³; Hogne Linga³; Ann Svensson¹; ¹Norwegian University of Science and Technology, NTNU; ²SINTEF; ³Hydro Aluminium AS

3:45 PM Break

4:00 PM

Air and CO₂ Reactivity of Carbon Anode and Its Constituents: An Attempt to Understand Dusting Phenomenon: *Francois Chevarin*¹; Lise Lemieux¹; Donald Ziegler²; Mario Fafard¹; Houshang Alamdari¹; ¹Laval University; ²Alcoa Primary Metals

4:25 PM

Effects of Coke Types and Calcining Levels on the Properties of Bench-Scale Anodes: *Ning Fang*¹; Jilai Xue¹; Xiang Li¹; Guanghui Lang²; Shoulei Gao²; Baiyuan Xia²; Jinlong Jiang²; Chongai Bao²; ¹School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing; ²Sunstone Development Co., Ltd

4:50 PM

Effects of Current Density and Temperature on Anode Carbon Consumption in Aluminum Electrolysis: Luxing Feng¹; Jilai Xue¹; Guanghui Lang²; Rifu Lin²; Wenxiang Li²; Xiuqin Xu²; ¹USTB; ²Sunstone Development Co., Ltd

Energy Technologies and Carbon Dioxide Management Symposium 2015 — Iron & Steel

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee

Program Organizers: Animesh Jha, University of Leeds; Brajendra Mishra, Colorado School of Mines; Eric Peterson, Idaho National Lab; Cong Wang, Northeastern University; Neale Neelameggham, Ind LLC; Donna Guillen, Idaho National Lab; Li Li, Cornell University

Tuesday PMRoom: Grand Harbor Salon 4March 17, 2015Location: Yacht & Beach

Session Chairs: Cong Wang, Northeastern University; Zuotai Zhang, Peking University

2:00 PM Invited

Influence of the Initial Solidification Controlliong on the Energy Saving during Continuous Casting: Lejun Zhou¹; *Wanlin Wang*¹; ¹Central South University

2:20 PM

Performance of Twin Oxygen-Coal Lances for PCI Operation in Blast Furnace Iron Making: *Huiqing Tang*¹; ¹University of Science and Technology Beijing

2:40 PM

Energy Saving and CO₂ Emission Reducing Analysis in Chinese Iron and Steel Industry: *Qi Zhang*¹; ¹Northeastern University

3:00 PM Invited

Investigation of the Heat Recovery from High Temperature Slags: Zuotai Zhang¹; Yongqi Sun¹; ¹Peking University

3:20 PM

Optimal Distribution of Byproduct Gases in Iron and Steel Industry Based on Mixed Integer Linear Programming (MILP): Xiancong Zhao¹; *Hao Bai*¹; Qi Shi²; Jiehai Han³; Hongxu Li²; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing; ²School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing; ³Handan Iron and Steel Company Limited

Fatigue in Materials: Fundamentals, Multiscale Modeling, Life Prediction and Prevention — Fatigue Behaviors of Nano-Materials

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Antonios Kontsos, Drexel University

Tuesday PM	Room: Australia 3
March 17, 2015	Location: Dolphin

Session Chairs: Christopher Muhlstein, Georgia Institute of Technology; Ramasis Goswami, Naval Research Laboratory

2:00 PM Invited

Micro-scale Notch Effects on the Nucleation and Propagation of Small Fatigue Cracks in Ni Thin Films: Farzad Sadeghi-Tohidi¹; *Olivier Pierron*¹; ¹Georgia Institute of Technology

2:25 PM

Cyclic Loading of Nanocrystalline FCC Metals Performed *In Situ* in a TEM: *Daniel Bufford*¹; John Sharon²; William Mook¹; Brad Boyce¹; Khalid Hattar¹; ¹Sandia National Laboratories; ²United Technologies Research Center

2:45 PM

Effect of Seed Crack on Plasticity of Ni Nanowire: Mohammed Aish¹; ¹Menoufia university

3:05 PM Invited

Fatigue Crack Growth in Two-Dimensional Nanosheets: Wade Lanning¹; Roi Meirom²; *Christopher Muhlstein*¹; ¹Georgia Institute of Technology; ²Pennsylvania State University

3:30 PM

Fatigue Crack Propagation in Conventionally Grained Ti and Ti Processed by ECAP: *Stanislava Fintová*¹; Ludvík Kunz²; Mandana Arzaghi³; Christine Sarrazin-Baudoux³; Jean Petit³; ¹CEITEC Brno University of Technology; ²Institute of Physics of Materials Academy of Sciences of the Czech Republic v.v.i.; ³Institute P[<]

3:50 PM Break

4:10 PM

Fatigue Damage Evolution and Accommodation in an Ultrafine-Grained Al-Mg-Sc Alloy: *Mageshwari Komarasamy*¹; Rajiv Mishra¹; ¹University of North Texas

4:30 PM

Improved Fatigue Properties of Ultrafine-Grained Copper under Cyclic Torsion Loading: *Ronghua Li*¹; Zhenjun Zhang¹; Peng Zhang¹; Zhefeng Zhang¹; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences

4:50 PM

Predicting Fatigue Resistance of Nano-Twinned Materials: *Piyas Chowdhury*¹; Huseyin Sehitoglu¹; Richard Rateick²; Hans Maier³; ¹University of Illinois at Urbana-Champaign; ²Honeywell Aerospace; ³University of Hannover

5:10 PM

Stress Analysis in the Vicinity of a Fatigue Crack Tip: *Soo Yeol Lee*¹; E-Wen Huang²; Wanchuck Woo³; ¹Chungnam National University; ²National Chiao Tung University; ³Korea Atomic Energy Research Institute

Friction Stir Welding and Processing VIII — Dissimilar Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Rajiv Mishra, University of North Texas; Murray Mahoney, retired from Rockwell Scientific; Yutaka Sato, Tohoku University; Yuri Hovanski, Pacific Northwest National Laboratory

Tuesday PMRoom: Northern Hemisphere A3March 17, 2015Location: Dolphin

Session Chairs: Yuri Hovanski, Pacific Northwest National Laboratory; Jennifer Wolk, Naval Surface Warfare Center

2:00 PM Invited

Realization of Metal Hybrid-Joints by Ultrasound Supported Friction Stir Welding – An Innovative Method to Improve the Joint Quality: *Benjamin Strass*¹; Guntram Wagner¹; ¹University of Kaiserslautern

2:20 PM Invited

Friction Stir Welding of Dissimilar Lightweight Metals with Addition of Adhesive: *Wei Yuan*¹; Kush Shah¹; Bita Ghaffari²; Harsha Badarinarayan¹; ¹Hitachi America Ltd.; ²Ford Motor Company

2:40 PM Invited

Dissimilar Aluminum-Steel FSW Lap Joints: *Egoitz Aldanondo*¹; Ekaitz Arruti¹; Jorge Garagorri¹; Alberto Echeverria¹; ¹IK4-LORTEK

3:00 PM

FUESDAY PM

Fatigue Behavior of Friction Stir Linear Welded Dissimilar Aluminum-to-

Magnesium Alloys: Harish Rao¹; *J. Jordon*¹; W. Yuan²; B. Ghaffari³; X. Su³; A. Khosrovaneh⁴; Y. Lee⁵; ¹University of Alabama; ²Hitachi America Ltd.; ³Ford Motor Company; ⁴General Motors Research and Development Center; ⁵Chrysler Group LLC

3:20 PM

Dissimilar Materials Joining of Aluminum/ Dual Phase 980 Spot Welded by Friction Bit Joining and Weldbonding: Study of Mechanical and Corrosion Properties: Yong Chae Lim¹; Lile Squires²; Tsung-Yu Pan¹; Michael Miles²; Yanli Wang¹; Zhili Feng¹; ¹Oak Ridge National Laboratory; ²Brigham Young University

3:40 PM Break

4:00 PM

Friction Stir Lap Welding of Aluminum - Polymer Using Scribe Technology: *Piyush Upadhyay*¹; Yuri Hovanski¹; Leo Fifield¹; Kevin Simmons¹; ¹Pacific Northwest National Laboratory

4:20 PM

Friction Stir Scribe Welding of Dissimilar Aluminum to Steel Lap Joints: *Todd Curtis*¹; Christian Widener¹; Bharat Jasthi¹; Michael West¹; Yuri Hovanski²; Blair Carlson³; Robert Szymanski³; William Bane¹; ¹South Dakota School of Mines and Technology; ²Pacific Northwest National Laboratory; ³General Motors R&D Center

4:40 PM

Coating Design for Controlling \946 Phase IMC Formation in Dissimilar Al-Mg Metal Welding: *Yin Wang*¹; Li Wang¹; Joe Robson¹; Phil Prangnell¹; ¹The University of Manchester

5:00 PM

Friction Stir Welding of Austenitic Stainless Steel to an Aluminum-Copper Alloy: *S. Babu*¹; S.K. Panigrahi¹; G.D. Janaki Ram¹; P.V. Venkitakrishnan²; R. Suresh Kumar²; ¹Indian Institute of Technology Madras; ²Indian Space Research Organisation

Frustrated Ferroic Materials — Modeling and Simulation

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Michael Manley, Oak Ridge National Laboratory; Raymundo Arroyave, Texas A & M University; Navdeep Singh, University of Houston

Tuesday PM	Room: Europe 1
March 17, 2015	Location: Dolphin

Session Chairs: Yunzhi Wang, Ohio State University; Markus Gruner, TU Duisburg-Essen

2:00 PM Invited

Modeling Strain and Magnetic Glass Behavior in Magnetic Shape-Memory Alloys: Antoni Planes¹; Teresa Castán¹; Avadh Saxena²; Pol Lloveras³; ¹Universitat de Barcelona; ²Los Alamos National Laboratory; ³Universitat Politècnica de Catalunya

2:30 PM Invited

First Principles Based Simulations of Relaxor Ferroelectrics: Benjamin Burton¹; ¹NIST

3:00 PM

Modeling Spin Glass Behavior in Shape Memory Alloys: Navdeep Singh¹; Markus Gruner²; Peter Entel²; Raymundo Arroyave³; ¹University of Houston; ²University of Duisburg-Essen; ³Texas A&M University

3:20 PM Break

3:40 PM Invited

First-Principles Calculation of Frustrated Ferroic Materials Ni-Co-Mn-(Ga, In, Sn): *Peter Entel*¹; Raymundo Arroyave²; Navdeep Singh³; Markus Gruner¹; Anna Grünebohm¹; Vladimir Sokolovskiy⁴; Vasiliy Buchelnikov⁴; ¹University of Duisburg-Essen; ²Texas A&M University; ³University of Houston; ⁴Chelyabinsk State University

4:10 PM

Monte Carlo Simulation of Magnetic Domain Structure and Property Near Morphotropic Phase Boundary: *Songrui Wei*¹; Sen Yang²; Dong Wang²; Xiaoping Song²; Xiaoqin Ke¹; Yipeng Gao¹; Yunzhi Wang¹; ¹The Ohio State Univiersity; ²Xi'an Jiaotong University

4:30 PM Invited

Interdependence of Magnetism and Adaptive Microstructure in Magnetic Shape-Memory Alloys: *Markus Gruner*¹; Sebastian Fähler²; Peter Entel¹; ¹University of Duisburg-Essen; ²IFW Dresden

5:00 PM

Flexoelectricity in Dielectrics: *Jiawang Hong*¹; Olivier Delaire¹; ¹Oak Ridge National Laboratory

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Fundamental Methods for Integrating Microstructure-Property-Design Relationships into the ICME Paradigm — Crystal Plasticity and Uncertainty Quantification

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee *Program Organizers:* Christopher Woodward, Air Force Research Laboratory; Somnath Ghosh, Johns Hopkins University

Tuesday PM March 17, 2015 Room: Oceanic 2 Location: Dolphin

Session Chairs: Jonathan Zimmerman, Sandia National Laboratory; Kirubel Teferra, Johns Hopkins University

2:00 PM Invited

Discovery and Numerical Tractability of Microstructure-Property Relationships through Micromechanical Modeling of Polycrystalline Materials: *Ricardo Lebensohn*¹; Reeju Pokharel¹; ¹Los Alamos National Laboratory

2:30 PM

A High-Performance Computational Framework for Fast Crystal Plasticity Finite Element Simulations: *Marko Knezevic*¹; Miroslav Zecevic¹; Daniel Savage¹; Rodney McCabe²; ¹University of New Hampshire; ²Los Alamos National Laboratory

2:50 PM

Numerically Robust Spectral Methods for Crystal Plasticity Simulations of Heterogeneous Materials: Pratheek Shanthraj¹; *Philip Eisenlohr*²; Martin Diehl¹; Franz Roters¹; ¹Max-Planck-Institut für Eisenforschung; ²Michigan State University

3:10 PM

Comparing the Predictions of Non-Schmid and Dislocation Density Based Crystal Plasticity Models for BCC Materials: *Aboozar Mapar*¹; Thomas Bieler¹; Farhang Pourboghrat¹; ¹Michigan State University

3:30 PM Break

3:50 PM Invited

Morphology and Size Sensitivity of Polycrystalline Microstructure Response: Kirubel Teferra¹; *Lori Graham-Brady*¹; ¹Johns Hopkins University

4:20 PM

Quantifying the Uncertainty of Microstructure Features Induced by Data Collection Protocols: *Kirubel Teferra*¹; Lori Graham-Brady¹; Michael Groeber²; Michael Uchic²; ¹Johns Hopkins University; ²Air Force Research Laboratory

4:40 PM

The Multi-Scale Closed Chain of Simulations – Incorporating Local Variations in Microstructure into Finite Element Simulations: Jakob Olofsson¹; Kent Salomonsson¹; Ingvar Svensson¹; ¹School of Engineering, Jönköping University

5:00 PM Invited

Uncertainty Quantification and Robust Design Across Design, Manufacturing and Service: Alexander Karl; ¹Rolls-Royce

High-Entropy Alloys III — Structures and Mechanical Properties

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Michael Gao, National Energy Technology Lab; Suveen Mathaudhu, University of California Riverside

Tuesday PM March 17, 2015 Room: Oceanic 5 Location: Dolphin

Session Chairs: Hamish Fraser, The Ohio State University; Nilesh Kumar, University of North Texas

2:00 PM Invited

Fracture Toughness and Fatigue-Crack Propagation Behavior of FCC High-Entropy Alloys at Ambient to Cryogenic Temperatures: Bernd Gludovatz¹; Keli Thurston¹; Anton Hohenwarter²; Dhiraj Catoor³; Hongbin Bei³; Easo George³; *Robert Ritchie*¹; ¹Lawrence Berkeley National Laboratory; ²Montanuniversität Leoben and Erich Schmid Institute of Materials Science, Austrian Academy of Sciences; ³Oak Ridge National Laboratory

2:20 PM Invited

Determination of the Three-Dimensional Microstructure and Ordering Schemes in Compositionally Complex Alloys: Brian Welk¹; Jake Jensen¹; John Sosa¹; Dan Huber¹; Robert Williams¹; Gopal Viswanathan¹; Jon Miller²; Adam Pilchak²; Dan Evans²; Oleg Senkov³; Mark Gibson⁴; Rajarshi Banerjee⁵; *Hamish Fraser*¹; ¹The Ohio State University; ²Air Force Research Laboratory; ³UES Inc.; ⁴CSIRO; ⁵University of North Texas

2:40 PM

Correlation of Structural-Disorder and Properties of Refractory High-Entropy Alloys: *Soumyadipta Maiti*¹; Walter Steurer²; ¹ETH Zurich ; ²ETH Zurich

3:00 PM Invited

Deformation Behavior of an Ultrafine Grained CrMnFeCoNi High-Entropy Alloy at Different Temperatures: *Nokeun Park*¹; Cemal Tasan²; Dierk Raabe²; Nobuhiro Tsuji¹; ¹Kyoto University; ²Max Planck Institute for Iron Research GmbH

3:20 PM Invited

Effect of Zr and Si Addition on Microstructure and Mechanical Properties of Multi-Component AlCuFeNiCr Alloys: *Dai-hong Xiao*¹; Penghui Zhou¹; ¹Central South University

3:40 PM Break

3:55 PM Invited

On the Friction Stress and Hall-Petch Coefficient of a Single Phase Face-Centered-Cubic High Entropy Alloy, Al0.1FeCoNiCr: *Nilesh Kumar*¹; Mageshwari Komarasamy¹; Zhi Tang²; Rajiv Mishra¹; Peter Liaw²; ¹University of North Texas; ²The University of Tennessee

4:15 PM Invited

High Pressure Torsion-Induced Structural Changes in AlxCoCrFeNi High Entropy Alloys: Hyun Seok Oh¹; Jin Yeon Kim¹; Hye Jung Chang²; Koichi Tsuchiya³; *Eun Soo Park*¹; ¹Seoul National University; ²Korea Institute of Science and Technology; ³National Institute for Materials Science

4:35 PM

Mechanical Behavior of CoCrFeMnNi, CoCrFeNi, CoCrFeMn High Entropy Alloys at Elevated Temperatures: *Joseph Licavoli*¹; Michael Gao¹; Paul Jablonski¹; Jeffrey Hawk¹; ¹Department of Energy

4:55 PM Invited

Mechanical and Thermodynamic Instabilities in Refractory High Entropy Alloys: Michael Widom¹; ¹Carnegie Mellon University

5:15 PM Invited

Strength and Deformation of Individual Phases in High-Entropy Alloys: A. Giwa¹; Haoyan Diao²; Xie Xie²; S, Y, Chen²; Zhi Tang²; Karin Dahmen³; Peter Liaw²; *Julia Greer*¹; ¹California Institute of Technology; ²The University of Tennessee; ³University of Illinois at Urbana Champaign

High-Performance Aerospace Alloys Design Using ICME Approach — Session IV

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee *Program Organizers:* Awadh Pandey, Pratt & Whitney ; Somnath Ghosh, Johns Hopkins University; Dongsheng Li, Pratt & Whitney

Tuesday PMRoom: Oceanic 6March 17, 2015Location: Dolphin

Session Chair: Awadh Pandey, Pratt & Whitney

2:00 PM Invited

Advances in Modeling and Simulation of Microstructure, with an Emphasis on 3D Aspects: *Reeju Pokharel*¹; Anthony Rollett²; ¹Los Alamos National Laboratory; ²Carnegie Mellon University

2:30 PM Invited

Modeling of Microstructurally Small Crack Growth through 3D Microstructures Using Crystal Plasticity Finite Element Simulations: *William Musinski*¹; David McDowell²; ¹US Air Force Research Laboratory; ²Georgia Institute of Technology

3:00 PM

Crystal Plasticity Based Constitutive Modeling and Finite Element Simulation of Twinning in Magnesium Alloys: Jiahao Cheng¹; Somnath Ghosh¹; ¹Johns Hopkins University

3:20 PM Break

3:40 PM Invited

Tailoring Microstructure to Minimize the Probability of Life-Limiting Fatigue Failures in the Titanium Alloy Ti-6Al-2Sn-4Zr-2Mo: Sushant Jha¹; Vikas Sinha²; Robert Brockman³; Adam Pilchak⁴; Reji John⁴; James Larsen⁴; ¹Air Force Research Laboratory/Universal Technology Corporation; ²UES Inc.; ³University of Dayton Research Institute; ⁴US Air Force Research Laboratory

4:10 PM

Modelling Microstructure Evolution during Dynamic Recrystallisation of Ni-Based Superalloys: *Enrique Galindo-Nava*¹; Catherine Rae¹; ¹University of Cambridge

4:30 PM

Reduced Order Descriptors for ICME of Titanium Alloys: *Veera Sundararaghavan*¹; John Allison¹; Abhishek Kumar¹; Anna Trump¹; Susan Gentry¹; Katsuyo Thornton¹; ¹University of Michigan

High-Temperature Electrochemistry II — Energy Storage Devices, Corrosion and Molten Salt Science

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee

Program Organizers: Prabhat Tripathy, Idaho National Laboratory; Guy Fredrickson, Idaho National Lab

Tuesday PMRoom: Grand Harbor Salon 2March 17, 2015Location: Yacht & Beach

Session Chairs: P. Chris Pistorius, Carnegie Mellon University; Dihua Wang, Wuhan University

2:00 PM

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Modeling the Operating Voltage of Liquid Metal Battery Cells: Jocelyn Newhouse¹; Donald Sadoway; *Takanari Ouchi*; ¹Massachusetts Institute of Technology

2:40 PM

Hot Corrosion Assessment of the Weld Overlay and Wrought Alloy 625 in a Heavy Metals-Containing Molten Salt Mixture: *E. Mohammadi Zahrani*¹; Akram Alfantazi¹; ¹University of British Columbia

3:20 PM Break

3:40 PM

Synthesis of High Performance LiMn0.8Fe0.2PO4/C Cathode Material for Lithium Ion Batteries: Effect of Calcination Temperature: *Enrui Dai*¹; Wei-bing Chen¹; Hai-sheng Fang¹; Hui Wang¹; Bin Yang¹; Wen-hui Ma¹; ¹Kunming University of Science and Technology

4:20 PM

Electrochemical Methods for Monitoring Actinide Concentrations in Molten LiF-CaF,/Bi System: *Milan Stika*¹; ¹University of Utah

High-Temperature Systems for Energy Conversion and Storage — High-Temperature Ceramic Materials: Response, Modelling and Performance

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee *Program Organizers:* Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Kyle Brinkman, Clemson University; Paul Ohodnicki, National Energy Technology Laboratory; Amit Shyam, Oak Ridge National Laboratory; Jung Pyung Choi, Pacific Northwest National Laboratory

Tuesday PMRoom: Grand Harbor Salon 1March 17, 2015Location: Yacht & Beach

Session Chairs: Amit Shyam, Oak Ridge National Laboratory; Kathy Lu, Virginia Tech

2:00 PM Introductory Comments

2:05 PM Invited

Multifunctional, Multilayer Thermal Barrier Coatings: Design, Synthesis and Performance: Sanjay Sampath¹; Vaishak Vishwanathan¹; Gopal Dwivedi¹; ¹Stony Brook University

2:40 PM

Nonlinear and Anisotropic Mechanical Response of Porous Microcracked Ceramics: *Ryan Cooper*¹; Amit Pandey²; Zachary Ladouceur¹; Amit Shyam¹; Thomas Watkins¹; ¹Oak Ridge National Laboratory; ²LG Fuel Cell Systems

3:05 PM

Solid Oxide Electrolysis Cells: Beyond Steam Electrolysis: S. Elangovan¹; Joseph Hartvigsen¹; ¹Ceramatec, Inc.

3:30 PM Break

3:45 PM

Thermomechanical Response of Porous and Microcracked Ceramic Materials: *Matthew Wheeler*¹; Anthony Kinnard¹; Ryan Cooper²; Amit Shyam²; Amit Pandey¹; ¹LG Fuel Cell Systems Inc.; ²Oak Ridge National Laboratory

4:10 PM Invited

Low-temperature Synthesis of ZrB2 Coatings Using Reactive Multilayers: Joost Vlassak¹; Dongwoo Lee¹; Gi-Dong Sim¹; Kechao¹; ¹Harvard University

4:45 PM

Experimental Measurements of Coating Interfacial Fracture Toughness as a Function of Mode-Mix: *Simon Lockyer-Bratton*¹; Kevin Hemker¹; Jaafar El-Awady¹; ¹Johns Hopkins University

5:10 PM Panel Discussion

TUESDAY PM

Hume-Rothery Award Symposium: Multicomponent Alloy Metallurgy, the Bridge from Materials Science to Materials Engineering — Solid State Transformations

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee

Program Organizers: Ursula Kattner, National Institute of Standards and Technology; Mark Asta, University of California at Berkeley; Raymundo Arroyave, Texas A&M University

Tuesday PM	Room: Oceanic 1
March 17, 2015	Location: Dolphin

Session Chairs: Raymundo Arroyave, Texas A&M University; Katsuyo Thornton, University of Michigan

2:00 PM Invited

Thermodynamics of Multi-Component Phases with Classical Atomistic Potentials: Y. Mishin¹; ¹George Mason University

2:30 PM Invited

Some Multicomponent Issues in Solid State Phase Transformations: John Agren¹; ¹Royal Institute of Technology

3:00 PM Invited

Aperiodic Zoo of Al-Fe-Si System: Leonid Bendersky1; 1NIST

3:30 PM Break

4:00 PM Invited

High Throughput Diffusion Research on Ti Alloys: *Yuwen Cui*¹; Yi Chen¹; Bin Tang¹; Guanglong Xu¹; ¹IMDEA Materials Institute

4:30 PM Invited

Phase-field Modeling of Phase Transformation and Microstructure Evolution in Ti-alloys: Yanzhou Ji¹; Taewook Heo²; *Long Qing Chen*¹; ¹Penn State University; ²Lawrence Livermore National Laboratory

5:00 PM Invited

Phase Relations in High Temperature Coating Systems: Carlos Levi¹; ¹University of California Santa Barbara

Integrative Materials Design II: Performance and Sustainability — Sustainability in Design and Manufacturing

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Materials and Society Committee

Program Organizers: Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Labs; Michael Sangid, Purdue University; Weizhou Li, Caterpillar Inc

Tuesday PM	Room: Grand Harbor Salon 8
March 17, 2015	Location: Yacht & Beach

Session Chairs: Diana Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Laboratories

2:00 PM Invited

Sustainable Materials Development: Design and Manufacturing for Recovery and Recyclability: Diran Apelian¹; ¹Worcester Polytechnic Institute

2:25 PM Invited

Designing for Resilience, Sustainability and Robustness in Materials Processing: *Richard Sisson*¹; ¹Worcester Polytechnic Institute, Center for Heat Treating Excellence

2:50 PM Invited

Factors Influencing Rare-Earth Metals Sustainability: Brajendra Mishra¹; ¹Colorado School of Mines

3:15 PM Invited

Development of Sustainable Non-Rare Earth High Energy Permanent Magnets for Electric Drive Vehicles: *Iver Anderson*¹; Andriy Palasyuk¹; Aaron Kassen¹; Emma M.H. White¹; Lin Zhou¹; Wei Tang¹; Kevin Dennis¹; R McCallum¹; Matthew Kramer¹; ¹Ames Laboratory

3:40 PM Break

4:00 PM Invited

Materials Challenges for a Novel Wind Turbine Rotary Electrical Contact Technology: *Nicolas Argibay*¹; Jeff Koplow¹; Michael Dugger¹; Brad Boyce¹; Wayne Staats¹; Brendan Nation¹; Bradley Salzbrenner¹; Tomas Babuska¹; ¹Sandia National Laboratories

4:25 PM

Data-Driven Analysis of Thermoelectric and Battery Materials: Performance and Resource Considerations: *Taylor Sparks*¹; Leila Ghadbeigi¹; Michael Gaultois²; Christopher Borg²; Jaye Harada²; Ram Seshadri²; William Bonificio³; David Clarke³; ¹University of Utah; ²University of California; ³Harvard University

4:45 PM Invited

Greenhouse Gas Emissions Evaluation of Electronics towards Sustainable Design: *Elsa Olivetti*¹; ¹Massachusetts Institute of Technology

5:10 PM Invited

Interconnected Carbon Nanosheets Derived from Hemp for Ultrafast Supercapacitors with High Energy: David Mitlin¹; ¹Clarkson University

Magnesium Technology 2015 — Deformation II

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: Michele Manuel, University of Florida; Martyn Alderman, Magnesium Elektron; Alok Singh, National Institute for Materials Science; Neale Neelameggham, Ind LLC

Tuesday PM March 17, 2015 Room: Northern Hemisphere E1 Location: Dolphin

Session Chairs: Suveen Mathaudhu, University of California, Riverside; Kiran Solanki, Arizona State University

2:00 PM

Micromechanical Modeling of Evolving Anisotropy in AZ31 Mg for Various Strain Paths: *Oana Cazacu*¹; Nitin Chandola¹; ¹University of Florida

2:20 PM

Crystal Plasticity Modeling of the Dynamic Behavior of Mg Alloy, WE43-T5, Plate: *Jishnu Bhattacharyya*¹; Sean Agnew¹; Peidong Wu²; Wilburn Wittington³; Haitham El Kadiri³; ¹University of Virginia; ²McMaster University; ³Mississippi State University

2:40 PM

New Model Prediction of the Unusual Buckling Behavior of AZ31 Mg: Nitin Chandola¹; Oana Cazacu¹; ¹University of Florida

3:00 PM

Why Do Magnesium Alloys Develop Sharp Textures upon Dynamic Recrystallization? *Haitham El Kadiri*¹; Christopher Barrett; Aidin Imandoust¹; Sean Agnew; ¹Mississippi State University

3:20 PM

Recrystallization Behavior of the Magnesium Alloy ZE20: *Xianfeng Ma*¹; Mei Li²; John Allison¹; ¹University of Michigan; ²Ford Motor Company

3:40 PM Break

4:00 PM

Ballistic Characterization of the Scalability of AMX602: *Tyrone Jones*¹; Katsuyoshi Kondoh²; ¹U.S. Army Research Laboratory; ² Osaka University

4:20 PM

Large Strain Behaviour of ZEK100 Magnesium Alloy at Various Strain Rates: *Julie Lévesque*¹; Shrihari Kurukuri²; Raja Mishra³; Michael Worswick²; Kaan Inal²; ¹Université Laval; ²University of Waterloo; ³GM R&D Center

4:40 PM

Effect of Solute Segregation on Fracture Behavior of Mg Alloy: *Tomoaki Kawa*¹; Masatake Yamaguchi²; Naoko Ikeo¹; Toshiji Mukai¹; ¹Kobe University; ²Japan Atomic Energy Agency

Magnetic Materials for Energy Applications V — Magnetocaloric Materials II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Magnetic Materials Committee

Program Organizers: Francis Johnson, GE Global Research; Raju Ramanujan, Nanyang Technological University; Paul Ohodnicki, National Energy Technology Laboratory

Tuesday PM	Room: Grand Harbor Salon 7
March 17, 2015	Location: Yacht & Beach

Session Chairs: Karl Sandeman, Imperial College of London; Alex Leary, Carnegie Mellon University

2:00 PM Invited

Advanced Nanocomposites for Functional Magnetic Refrigeration: Hariharan Srikanth¹; ¹University of South Florida

2:30 PM Invited

The Role of Structural Disorder in Magnetic Nanostructures for Magnetocaloric Applications: *Michael McHenry*¹; ¹Carnegie Mellon University

3:00 PM Invited

Tips and Tricks for the Correct Analysis of the Field Dependence of the Magnetocaloric Effect: *Victorino Franco*¹; Luis Moreno-Ramírez¹; Carlos Romero-Muñiz²; Jhon Ipus¹; Javier Blázquez¹; Alejandro Conde¹; ¹Sevilla University; ²Autonomous University of Madrid

3:30 PM Break

3:45 PM

Magnetocaloric Behaviour of Mn-Fe-P-Ge Alloys: *Xi Chen*¹; Raju Ramanujan¹; ¹NTU

4:05 PM

Microstructural and Crystallographic Characterization of Ni49+xMn36xIn15 Alloys (x=0, 0.5, 1, 1.5 and 2.0): *Le Zhou*¹; Anit Giri²; Kyu Cho³; Yongho Sohn¹; ¹University of Central Florida; ²3TKC Global; ³US Army Research Laboratory

4:25 PM

Field-Induced Deformation in Magnetic Shape Memory Alloys: Domain Mechanisms and Magnetoelastic Properties: *Yongmei Jin*¹; ¹Michigan Technological University

4:45 PM

Enhanced Efficiency of Layered Ceramic Magnetic Refrigerant: *Jong-Woo Kim*¹; Jong-Jin Choi¹; Cheol-Woo Ahn¹; Byung-Dong Hahn¹; Jungho Ryu¹; Woon-Ha Yoon¹; Joon-Hwan Choi¹; Dong-Soo Park¹; ¹Korea Institute of Materials Science

Materials and Fuels for the Current and Advanced Nuclear Reactors IV — Structural Materials I

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory

luesday PM	Room: Grand Harbor Salon 6
March 17, 2015	Location: Yacht & Beach

Session Chair: Steve Zinkle, Oak Ridge National Laboratory

2:00 PM

Advanced ODS FeCrAl Alloys for Accident-Tolerant Fuel Cladding: Sebastien Dryepondt¹; Kinga Unocic¹; David Hoelzer¹; Bruce Pint¹; ¹Oak Ridge Nataional Laboratory

2:20 PM

The Lift-Out Mechanical Testing of Highly Irradiated Structural Materials: *David Frazer*¹; Nathan Bailey¹; Hi Vo¹; Ashley Reichardt¹; Josh Kacher¹; Y. Chen²; E.A Marquis²; Peter Hosemann¹; ¹University of California, Berkeley; ²University of Michigan Ann Arbor

2:40 PM

Advanced Investigations on the Strengthening Mechanisms in Austenitic ODS Stainless Steels: *Yinbin Miao*¹; Kun Mo²; Bai Cui¹; Zhangjian Zhou³; Michael Miller⁴; Kathy Powers⁴; Virginia McCreary¹; Xiang Liu¹; Kuan-Che Lan¹; Guangming Zhang³; Jonathan Almer²; Ian Robertson⁵; James Stubbins¹; ¹University of Illinois at Urbana-Champaign; ²Argonne National Laboratory; ³University of Science and Technology Beijing; ⁴Oak Ridge National Laboratory; ⁵University of Wisconsin-Madison

3:00 PM

Tensile and Fracture Toughness Properties of 14Cr-3W-0.3Ti-0.2Y (FCRD NFA-1): Md Ershadul Alam¹; N.J. Cunningham¹; Kirk Fields¹; David Gragg¹; *G.R. Odette*¹; David Hoelzer²; S.A. Maloy³; ¹University of California Santa Barbara; ²Oak Ridge National Laboratory; ³Los Alamos National Laboratory

3:20 PM

Thermal Ageing Experiments of Ferritic-ODS Alloys: Marta Serrano¹; Mercedes Hernandez-Mayoral¹; Elvira Oñorbe¹; Hassan Eddaoudi¹; ¹CIEMAT

3:40 PM Break

4:00 PM

Quantification of the Variability in Physical and Mechanical Properties of Nuclear-Grade Graphites: M.C. Carroll¹; ¹Idaho National Laboratory

4:20 PM

Performance of Ultrafine-Grained Tungsten under ELMs-Like Transient Heat Loads of ITER: *Osman El-Atwani*¹; Anastassiya Suslova¹; Sivanandan Harilal¹; Ahmed Hassanein¹; ¹Purdue University

4:40 PM

Mechanical Properties and Microstructural Stability of Oxide Dispersion Strengthened Alloy 617: *Young-Bum Chun*¹; Chang-Hee Han¹; Jinsung Jang¹; ¹Korea Atomic Energy Research Institute

5:00 PM

Microstructure Characterization of 12Cr ODS Steel after Creep Rupture Test at 700°C: *Jinsung Jang*¹; Xiaodong Mao¹; Sung Soo Kim¹; Woo Gon Kim¹; Chang Hee Han¹; Tae Kyu Kim¹; Young Soo Han¹; ¹Korea Atomic Energy Research Institute

MHD 2015: Nagy El-Kaddah Memorial Symposium on Magnetohydrodynamics (MHD) in Materials Processing — MHD Flow

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee Program Organizers: Ramana Reddy, The University of Alabama;

Thinium Natarajan, U. S. Steel

Tuesday PM	Room: Swan 2
March 17, 2015	Location: Swan

Session Chairs: Chris Pistorius, Carnegie Mellon University; Francisco Acosta-Gonzalez, CINVESTAV

2:00 PM Introductory Comments

2:05 PM Invited

Convection in Duct Flows with Very Strong Magnetic Fields: *Oleg Zikanov*¹; Xuan Zhang¹; ¹University of Michigan Dearborn

2:30 PM Invited

Non-Contact Flow Measurement and Flow Control in Metal Melts Using Lorentz Force Techniques: *Christian Karcher*¹; Nataliia Dubovikova¹; Daniel Hernandez¹; Yuri Kolesnikov¹; ¹Technische Universitärt Ilmenau

2:55 PM Invited

Arrays of Rotating Permanent Magnet Dipoles for Stirring and Pumping of Liquid Metals: *Andris Bojarevics*¹; Toms Beinerts¹; Martinš Sarma¹; Mihails Šcepanskis²; ¹Institute of Physics of University of Latvia; ²University of Latvia

3:20 PM Break

3:35 PM Invited

Flow Control of Molten Metal Using Measurements of Physical Properties and Flow Rate by MHD Techniques: Yuri Kolesnikov¹; Rico Klein¹; ¹Ilmenau University of Technology

4:00 PM Invited

Flow Visualization by Means of Contactless Inductive Flow Tomography in the Presence of a Magnetic Brake: *Matthias Ratajczak*¹; Thomas Wondrak¹; Klaus Timmel¹; Frank Stefani¹; Sven Eckert¹; Gunter Gerbeth¹; ¹Helmholtz-Zentrum Dresden-Rossendorf

4:25 PM

The Formation of a Magnetically Driven Tornado-Like Vortex: *Tobias Vogt*¹; Ilmars Grants¹; Sven Eckert¹; Gunter Gerbeth¹; ¹Helmholtz-Zentrum Dresden-Rossendorf

4:45 PM

Application of Lorentz Force Techniques for Flow Rate Measurement: *Reschad Ebert*¹; Nataliia Dubovikova¹; Christian Karcher¹; Christian Resagk¹; ¹Technische Universitaet Ilmenau

Micromechanics of Structurally Inhomogeneous Materials: An FMD Symposium in Honor of Armen Khachaturyan — Micromechanics of Functional Materials

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee *Program Organizers:* Long Qing Chen, Penn State University; Mark Asta, University of California, Berkeley; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yongmei Jin, Michigan Technological University; Yann Le Bouar, LEM, CNRS/ ONERA

Tuesday PM March 17, 2015 Room: Asia 3 Location: Dolphin

Session Chair: Raymundo Arroyave, Texas A&M

2:00 PM Invited

Elastic Domains: from Epitaxial Film Nanostructures to Bulk Crystal Microstructure: *Alexander Roytburd*¹; Julia Slutsker¹; ¹University of Maryland

2:30 PM Invited

Morphological Transitions in Domain Structures and Their Effects on P(E) Hysteresis Curves in Thin Ferroelectric Films: Andrei Artemev¹; ¹Carleton University

3:00 PM Invited

Functional Materials with High Twin-Wall Densities: *Dwight Viehland*'; ¹Virginia Polytechnic Institute and State University

3:30 PM Break

3:50 PM Invited

Universal Morphology of Nonlinear Telephone Cord Buckles: *Yong Ni*¹; Senjiang Yu²; Ai-Kah Soh³; Linghui He¹; ¹University of Science and Technology of China; ²Department of Physics, China Jiliang University; ³School of Engineering, Monash University Sunway Campus

4:20 PM

First Order Morphological Transition of Ferroelastic Domains in Ferroelectric Thin Films: Jason Britson¹; Chris Nelson²; Xiaoqing Pan²; Long Qing Chen¹; ¹Penn State University; ²University of Michigan

4:40 PM

Crystallographic Design of Ferroic Smart Materials: Transformation Pathway Network Analysis: *Yipeng Gao*¹; Suliman Dregia¹; Yunzhi Wang¹; ¹The Ohio State University

5:00 PM

Modeling Microstructural Stability for Advanced FE Systems: *Youhai Wen*¹; ¹National Energy Technology Laboratory



Microstructural Processes in Irradiated Materials — Austenitic, Ni-based, and Zr-based Alloys

Sponsored by: TMS: Nuclear Materials Committee Program Organizers: Dane Morgan, University of Wisconsin -Madison; Thak Sang Byun, Oak Ridge National Laboratory; Yasuyoshi Nagai, Tohoku University; Zhijie Jiao, University of Michigan; Kai Nordlund, University of Helsinki; Ming-Jie Zheng, University of Wisconsin

Tuesday PM March 17, 2015 Room: Asia 1 Location: Dolphin

Funding support provided by: Idaho National Laboratory and Oak Ridge National Laboratory

Session Chairs: Yanwen Zhang, University of Tennessee; Emmanuelle Marquis, University of Michigan

2:00 PM Invited

Quantitative Characterization of Microstructures in Proton Irradiated Stainless Steels: Yimeng Chen¹; Peter Chou; George Jiao¹; Gary Was; *Emmanuelle Marquis*¹; ¹University of Michigan

2:30 PM Invited

Ferrite Decomposition and G-Phase Precipitation in Ion-Irradiated CASS CF8 Revealed by APT: *Meimei Li*¹; Michael Miller¹; Jonathan Poplawsky¹; Wei-ying Chen¹; Mark Kirk¹; Pete Baldo¹; Tiangan Lian¹; ¹Argonne National Laboratory

3:00 PM Invited

Effects of Chemical Disorder on Defect Dynamics under Ion Irradiation: *Yanwen Zhang*¹; Hongbin Bei¹; Ke Jin²; Liang Qiao¹; Hans Christen¹; William Weber²; ¹Oak Ridge National Laboratory; ²University of Tennessee

3:30 PM Break

3:45 PM

Influence of Grain Boundary Character Effects in Neutron Irradiated Stainless Steel: Christopher Barr¹; James Cole²; Mitra Taheri¹; ¹Drexel University; ²Idaho National Laboratory

4:00 PM

Swelling and Radiation-Induced Segregation/Depletion in Annealed 304SS Irradiated at PWR-Relevant Dose Rates: *Yan Dong*¹; Bulent Sencer²; Frank Garner³; Emmanuelle Marquis¹; ¹University of Michigan; ²Idaho National Laboratory; ³Radiation Effects Consulting

4:15 PM

Phase Instability in 300 Series Austenitic Steels Irradiated in Different Environments: *Maxim Gussev*¹; Jeremy Busby¹; Kevin Field¹; David McClintock¹; ¹Oak Ridge National Laboratory

4:30 PM

Disordering and Dissolution of Ordered L12 Precipitate in Rene N4 under Irradiation: *C. Sun*¹; T. Lee²; M. Demkowicz²; S. Maloy¹; O. Anderoglu¹; ¹Los Alamos National Laboratory; ²Massachusetts Institute of Technology

4:45 PM

Improvement of Irradiation and Corrosion Resistance of a 316 Austenitic Stainless Steel by Grain Refinement: Prasath Babu Revathy Rajan¹; Eric Hug²; Isabelle Monnet³; *Auriane Etienne*¹; Nariman Enikeev⁴; Bertrand Radiguet¹; ¹GPM UMR CNRS 6634 - Université et INSA de Rouen; ²CRISMAT, UMR 6508, ENSICaen, université de Caen; ³CIMAP-ENSICAEN-CEA-CNRS-Université de Caen; ⁴Institute of Physics of Advanced Materials

5:00 PM

Vacancy Clustering in Zirconium: An Atomic Scale Study: Céline Varvenne¹; Emmanuel Clouet¹; ¹SRMP, CEA Saclay

5:15 PM

The Effect of Fe on Dislocation Loop Formation Studied in Pproton-Irradiated Binary Zr Alloys: *Matthew Topping*¹; Michael Preuss¹; Philipp Frankel¹; Simon Dumbill²; ¹University of Manchester; ²National Nuclear Laboratories

5:30 PM

Physics-Based Modeling of Zirconium Hydride Precipitation and Growth in Zirconium Using a CALPHAD-Based Phase Field Model: Andrea Jokisaari¹; Katsuyo Thornton¹; ¹University of Michigan

Multiscale Microstructure, Mechanics and Prognosis of High Temperature Alloys — Processing and In Situ Characterization

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: High Temperature Alloys Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Mark Tschopp, Army Research Laboratory; Jeffrey Evans, University of Alabama in Huntsville; Jonathan Cormier, ENSMA / Institut Pprime - UPR CNRS 3346; Qiang Feng, University of Science and Technology Beijing

Tuesday PM	Room: Oceanic 7
March 17, 2015	Location: Dolphin

Session Chairs: Lei Wang, Northeastern University; Jean-Briac le Graverend, Texas A&M; Jonathan Cormier, ISAE-ENSMA & Institut Pprime

2:00 PM Invited

Deformation Mechanism Maps for Grain Boundary Engineering of Ni-Base Superalloys: Sammy Tin¹; Baishun Li¹; ¹Illinois Institute of Technology

2:20 PM

Thermomechanical Processing of Nickel Aluminide Intermetallics: *Bernard Tougas*¹; Mohammad Jahazi²; ¹Centre de Metallurgie du Quebec; ²Ecole de technologie superieure

2:40 PM

Hot workability and Deformation Behavior of the NiAl-Based Eutectics: *Srdjan Milenkovic*¹; Arcadio Varona¹; Du Rou²; ¹IMDEA Materials Institute; ²Beihang University

3:00 PM

An Investigation of Grain Boundary Character Evolution in Nickel 200: *Olivia Underwood*¹; ¹University of Alabama Huntsville

3:20 PM

Application of External Field Treatment for the Microstructure Controlling of Nickel-Base Superalloy: Lei Wang¹; Yang Liu; Yao Wang¹; Guohua Xu²; ¹Northeastern University; ²Central Iron and Steel Research Institute

3:40 PM Break

4:00 PM

The Effect of Strain Distribution on Microstructural Developments during Forging in a New Ni Based Superalloy: *Ross Buckingham*¹; Christos Argyrakis²; Mark Hardy²; Soran Birosca¹; ¹Swansea University; ²Rolls-Royce plc.

4:20 PM Invited

Experimental Investigation of Full-Field Deformations at the Microstructural Length Scale: Samantha Daly¹; ¹University of Michigan

4:40 PM

Real Time In Situ X-Ray Diffraction Study of the High Temperature Mechanical Behavior of a Rafted Single Crystal Superalloy: *Thomas Schenk*¹; Alain Jacques¹; Jean Briac Le Graverend²; Jonathan Cormier³; ¹IJL-CNRS/LabEx DAMAS; ²California Institute of Technology; ³Institut P', CNRS-ENSMA-Université de Poitiers

5:00 PM

Time and Spatial Resolved Observation of Phase Transformation during Solidification of Laser-Beam Welded TiAl Alloy: *Jie Liu*¹; Peter Staron¹; Stefan Riekehr¹; Andreas Stark¹; Norbert Schell¹; Norbert Huber¹; Andreas Schreyer¹; Martin Müller¹; Nikolai Kashaev¹; ¹Helmholtz-Zentrum Geesthacht, Germany
TUESDAY PM

Nano- and Micro-Mechanical Measurements in Harsh Environments — Micromechanical Testing of Irradiated Materials

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee *Program Organizers:* Peter Hosemann, UC Berkeley; Jeffrey Wheeler, EMPA; Verena Maier, Erich Schmidt Institut; Douglas Stauffer, Hysitron

Tuesday PM	Room: Oceanic 4
March 17, 2015	Location: Dolphin

Session Chair: Peter Hosemann, Berkeley University

2:00 PM Invited

In-Situ Measurements of Irradiation-Induced Creep in Nanocrystalline and Amorphous Alloys: *Robert Averback*¹; Sezer Özerinç¹; William King¹; Sungeun Kim¹; Yinon Ashkenazy¹; ¹University of Illinois

2:40 PM

Effect of Gamma Radiation on the Mechanical and Degradation Properties of Bromobutyl Rubber Compounds: *Sandra Scagliusi*¹; Elizabeth Cardoso¹; Ademar Lugão¹; ¹Instituto de Pesquisas Energéticas e Nucleares - IPEN

3:00 PM

High Temperature Nanoindentation and *Ex Situ* Microcompression Testing on Proton-Beam Irradiated 304 SS: *Ashley Reichardt*¹; Manuel Abad¹; Hi Vo¹; Amanda Lupinacci¹; David Frazer¹; Peter Hosemann¹; ¹University of California, Berkeley

3:20 PM Break

3:50 PM

Probing Nanoscale Damage Gradients in Irradiated Materials with Spherical Nanoindentation: *Siddhartha Pathak*¹; Surya Kalidindi²; Yongqiang Wang¹; Russ Doerner³; Nathan Mara¹; ¹Los Alamos National Laboratory; ²Georgia Institute of Technology; ³University of California San Diego

4:10 PM

Unusual Size-Dependent Strengthening Mechanisms in Helium Ion Irradiated Immiscible Coherent Cu/Co Nanolayers: *Youxing Chen*¹; Yue Liu¹; Engang Fu²; Yongqiang Wang³; Haiyan Wang¹; Xinghang Zhang¹; ¹Texas A&M University; ²Peking University; ³Los Alamos National Laboratory

4:30 PM

Correlate Nano-Hardness to Conventional Vickers Hardness on Irradiated ODS Alloy: *Jatuporn Burns*¹; Ramprashad Prabhakaran²; Yaqiao Wu¹; Joanna Talyor³; Kristi Moser⁴; Darryl Butt¹; ¹CAES/Boise State University; ²University of Idaho; ³CAES/University of Idaho; ⁴CAES/Idaho State University

Nanocomposites III — Multifunctional Nanocomposites I and Tailored Nanostructures

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Muralidharan Paramsothy, National University of Singapore, NanoWorld Innovations (NWI); Meisha Shofner, Georgia Institute of Technology; Changsoo Kim, University of Wisconsin-Milwaukee

Tuesday PM	Room: Europe 2
March 17, 2015	Location: Dolphin

Session Chairs: Jonathan Spowart, Air Force Research Laboratory; Scott Poveromo, University of California at Irvine and Northrop Grumman

2:00 PM Invited

Metallic and Hybrid Nanostructures: Synthesis, Properties and Applications: Simona Hunyadi Murph¹; ¹Savannah River National Laboratory

2:40 PM Invited

Broad-Band and Omnidirectional Graded-Refractive-Index, Antireflective Coatings with Self-Cleaning and Anti-Fogging Capability: *Tolga Aytug*¹; L Tao¹; A Lupini¹; P Joshi¹; I Ivanov¹; M Paranthaman¹; R Menon²; P Wang²; ¹Oak Ridge National Laboratory; ²University of Utah

3:20 PM Break

3:40 PM

Completely Green Synthesis of Dextrose Reduced Silver Nanoparticles Decorated MWCNT, Its Antibacterial and Catalytic Properties: Sneha Mohan¹; *Oluwafemi Oluwatobi*¹; Sandile Songca²; Nandakumar Kalarikkal³; Sabu Thomas³; ¹Cape-Peninsula University of Technology; ²Walter Sisulu University; ³Mahatma Gandhi University

4:00 PM

Modeling Mechanical Properties of a 2D Single Walled Carbon Nanotube (SWCNT) Network: *Ankit Gupta*¹; Elizabeth Holm¹; ¹Carnegie Mellon University

4:20 PM

Controlling Orientation and Morphology of Pores in Mesoporous Silica Thin Film: *Eun-Mee Kim*¹; Choong-Un Kim¹; ¹University of Texas at Arlington

4:40 PM

Synthesis and Characterization of Metallic Tubular Nanoporous Structures: *Theresa Juarez*¹; Andrea Hodge¹; ¹University of Southern California

Nanostructured Materials for Rechargeable Batteries and for Supercapacitors III — Session IV: Computational Methods and Advanced Batteries

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee *Program Organizers:* Reza Shahbazian-Yassar, Michigan Technological University; Yan Yao, University of Houston; David Mitlin, Clarkson University

Tuesday PM March 17, 2015 Room: Europe 3 Location: Dolphin

Session Chairs: Yan Yao, University of Houston; Reza Shahbazian-Yassar, Michigan Technological University

2:00 PM Invited

Predict and Design Interface Properties for Si Based Electrode in Li-Ion Batteries: Yue Qi¹; ¹Michigan State University

2:25 PM Invited

Pursue High Energy Density and Power Density Battery with Atomic Simulation: *Chen Ling*¹; ¹Toyota Motor Engineering & Manufacturing North America, Inc.

2:50 PM Invited

Effects of Nanostructures on Beyond Li-Ion Energy Storage: Insights from First Principles Calculations: *Yifei Mo*¹; ¹University of Maryland College Park

3:15 PM Invited

Supercapacitors Based on Graphene Electrodes and Polymeric Ionic Liquid Electrolyte: Computer Simulation Study: Andrew DeYoung¹; *Hyung Kim*¹; ¹Carnegie Mellon University

3:40 PM Break

3:55 PM Invited

Combined Electrochemical Impedance and Acoustic Emission Characterization of Lithium-Ion Battery Electrodes: *Partha Mukherjee*¹; Chien-Fan Chen¹; Pallab Barai¹; ¹Texas A&M University

4:20 PM Invited

Mineral-Inspired, Nanostructured Polyanion Materials for Rechargeable Battery Electrodes: Ran Zhao¹; Candace Chan¹; ¹Arizona State University

4:45 PM Invited

High Performance Solid PEO/Graphene Oxide Nanocomposite Electrolyte in Flexible Lithium Ion Battery: *Haleh Ardebili*¹; Mengying Yuan¹; Mejdi Kammoun¹; ¹University of Houston

5:10 PM Invited

Understanding Electrode-Electrolyte Solution Interactions between TiO2 Nanotube Electrode and Nonaqueous Electrolytes for Sodium-Ion Batteries: Riley Parrish¹; Richard Cutler¹; Ganesh Kamath²; Eric Dufek³; Subramanian Sankaranarayanan⁴; *Hui (Claire) Xiong*¹; ¹Boise State University; ²University of Missouri–Columbia; ³Idaho National Laboratory; ⁴Argonne National Laboratory

Neutron and X-Ray Studies of Advanced Materials VIII: Diffraction Limit and Beyond — Organic and Functional Materials

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Brent Fultz, California Institute of Technology; Peter Liaw, University of Tennessee; Jaimie Tiley, Air Force Research Laboratory

Room: Pelican 1

Location: Swan

Tuesday PM March 17, 2015

Funding support provided by: Air Force Research Laboratory

Session Chairs: Michael Manley, Oak Ridge National Laboratory; Feng Ye, SNS

2:00 PM Keynote

Anisotropic Lattice Distortions in Crystals Grown by Organisms: *Emil* Zolotoyabko¹; ¹Technion

2:40 PM Invited

From Phonons to Functionality: Winfried Petry¹; ¹Technische Universität München

3:10 PM

Neutron Diffraction Study of Crystal Structure and Magnetic Transition in Mn2-xFexP1-yGey Magnetocaloric Compounds: *Danmin Liu*¹; Qingzhen Huang²; Zhenlu Zhang¹; Ming Yue¹; Jiuxing Zhang¹; ¹Beijing University of Technology; ²National Institute of Standards and Technology

3:30 PM

Strain Gradients Near Domain Boundaries in NiMnGa-Based Twinned Single Crystal: Rozaliya Barabash¹; ¹Oak Ridge National Laboratory

3:50 PM Break

4:00 PM Invited

Magnetic Studies in Shape Memory Alloys by Neutron and Synchrotron Techniques: *Jose Manuel Barandiaran*¹; Volodymyr Chernenko¹; Maria Luisa Fernandez-Gubieda¹; Patricia Lazpita¹; Akio Kimura²; ¹BCMaterials and UPV/EHU; ²Hiroshima University

4:30 PM

Understanding Improved Magnetocaloric Performance of Ni2+xMn1xGa Heusler Alloys Based on Texture Studies: *Michael McLeod*¹; Bhaskar Majumdar¹; Sven Vogel²; Olivier Gourdan²; Matt Reiche²; ¹New Mexico Tech; ²Los Alamos National Laboratory

4:50 PM

Mapping of Texture and Phase Fractions in Non-Uniform Stress States during Torsional Loading of Superelastic NiTi: *Douglas Nicholson*¹; Santo Padula²; Othmane Benafan²; Robin Woracek³; Stephen Puplampu³; Jeffrey Bunn³; Andrew Payzant⁴; Dayakar Penumadu³; Raj Vaidyanathan¹; ¹University of Central Florida; ²NASA Glenn Research Center; ³University of Tennessee; ⁴Oak Ridge National Laboratory

5:00 PM

In-Situ Study of Phase Transition of NiMnInFe Alloys under High Magnetic Field by High-Energy X-ray Measurement: Gang Wang¹; 'Northeastern University

New Horizons for Mechanical Spectroscopy in Materials Science — Glasses, Models and Measurements

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Nicolás Mujica, Universidad de Chile; Michael Demkowicz, MIT; Fernando Lund, Universidad de Chile; Alfredo Caro, Los Alamos National Laboratory

Tuesday PM	Room: Macaw 1
March 17, 2015	Location: Swan

Session Chair: Fernando Lund, Universidad de Chile

2:00 PM Invited

Measurement of Plastic Deformation in Silica Glasses with Raman Spectroscopy: A Theoretical Study: Anne Tanguy¹; Nikita Shcheblanov¹; ¹University Lyon

2:30 PM Invited

Studying Glass under Extreme Conditions Using In-Situ Brilloiuin and Raman Light Scattering: Liping Huang¹; ¹Rensselaer Polytechnic Institute

3:00 PM Invited

Relaxation-Time Spectra of Glasses: *Michael Atzmon*¹; JongDoo Ju¹; ¹University of Michigan

Novel Synthesis and Consolidation of Powder Materials — Powder Metallurgy of Light Alloys (Ti, Al, Mg) and Composites II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: Ma Qian, RMIT University (Royal Melbourne Institute of Technology); Iver E Anderson, The Ames Laboratory

Tuesday PMRoom: Swan 10March 17, 2015Location: Swan

Session Chairs: Katsuyoshi Kondoh, Osaka University ; Manoj Gupta, National University of Singapore

2:00 PM

Influence of Lattice Expansion via Annealing-Induced Carbon Intercalation on the Strength of Aluminum-Based Nanocomposite.: *Kwangmin Choi*¹; Hyunjoo Choi¹; Se-eun Shin²; Donghyun Bae²; ¹Kookmin University; ²Yonsei University

2:20 PM

Strengthening Behavior and Mechanisms of Extruded Powder Metallurgy Pure Ti Materials Reinforced with Ubiquitous Light Elements: *Takanori Mimoto*¹; Junko Umeda¹; Katsuyoshi Kondoh¹; ¹Osaka University

2:40 PM

Processing-Structure-Property Relations in Powder Metallurgy (PM) Processed MgY2Zn1 Alloys: *R. Sadangi*¹; D. Kapoor²; T. Zahrah³; ¹ Armament Research Development Engineering Center; ²Retired - Armament Research Development & Engineering Center; ³Matsys, Inc

3:00 PM Invited

In-Situ Formed AlN Dispersed Aluminum Composite via Powder Metallurgy Route: *Katsuyoshi Kondoh*¹; Motohiro Onishi¹; Lei Jia¹; Junko Umeda¹; Hisashi Imai¹; ¹Osaka University

TUESDAY PM

3:25 PM Break

3:45 PM Keynote

New Developments in the Korean PM Industry over the Last Decade: Young Do Kim1; Hanshin Choi2; 1Hanyang University; 2Korea Institute of Industrial Technology

4:20 PM Invited

On the Dissolution of the Surface Oxide Films on Titanium Powder Particles during Sintering: Yafeng Yang1; Ma Qian1; 1RMIT University

4:45 PM Invited

Synthesis and Characterization of Carbon Nanotubes Reinforced Titanium Composites via Powder Metallurgy: Khurram Munir¹; Cuie Wen²; ¹Swinburne University of Technology; ²RMIT University

Pb-Free Solders and Emerging Interconnect and Packaging — Lead-Free IMC Formation and Mechanical Behavior

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Electronic Packaging and Interconnection Materials Committee Program Organizers: John Elmer, Los Alamos National Laboratory; Yan Li, Intel Corp.; Andre Lee, Michigan State University; Fan-Yi Ouyang, National Tsing Hua University; Srini Chada, Schlumberger; Kyu-Oh Lee, Intel Corp.; Kwang-Lung Lin, National Cheng Kung University; Christopher Gourlay, Imperial College; Daniel Lewis, Rensselaer Polytechnique Institute; Fan Gao, U. Masachusetts Lowell

Tuesday PM	Room: Lark
March 17, 2015	Location: Swan

Session Chairs: Daniel Lewis, Rensselear Polytechnique Institute; Fan Gao, University Masachusetts Lowell

2:00 PM

Elastic Constants of Cu6Sn5: Resonant Ultrasound Spectroscopy Experiments and Validation by Atomistic Simulation: Nikhilesh Chawla1; Ling Jiang¹; Nitin Muthegowda¹; Mehul Bhatia¹; Kiran Solanki¹; Albert Migliori²; ¹Arizona State University; ²Los Alamos National Laboratory

2:25 PM

Enhancing the Impact Properties of Tin-Copper and Tin-Copper-Nickel Lead-Free Solders with Trace Additions of Zinc, Indium and Gold: Keith Sweatman¹; Dekui Mu¹; Takatoshi Nishimura¹; ¹Nihon Superior Co., Ltd.

2:50 PM

The Influence of Metastable NiSn, in Joints between Sn-Ag Solders and ENIG Substrates: Sergey Belyakov¹; Christopher Gourlay¹; ¹Imperial College London

3:15 PM

In-Situ Imaging of Sn-Cu Lead-Free Soldering on Cu Substrates: Intermetallic Compound Formation and Growth: M. A. A. Mohd Salleh¹; S. D. McDonald¹; H. Yasuda²; A. Sugiyama³; K. Nogita¹; ¹University of Queensland; ²Kyoto University; ³Osaka Sangyo University

3:40 PM Break

3:55 PM

Interfacial Reaction of Fine Pitch Cu/Sn-Ag Pillar Bump on Cu/Zn and Cu/Ni UBM: Mi-Song Kim1; Kyoung-Ho Kim1; Mok-Soon Kim2; Sehoon Yoo1; 1Korea Institute of Industrial Technology / Advanced Welding and Joining R&BD group; ²Inha University / Department of Materials Science and Engineering

4:20 PM

Microstructural Evolution of the Intermetallic Compounds in the TCNCP Solder Joint during Pre-Con and TCT Tests: Chien-Lung Liang¹; Kwang-Lung Lin1; Jr-Wei Peng2; 1National Cheng Kung University; 2ASE Group, Kaohsiung

4:45 PM

Mechanical Property Variations of Intermetallics in Space-Confined Ni/ Sn/Cu Diffusion Couples: Wen-Lin Shih¹; Han Tang Hung¹; C. Robert Kao¹; ¹National Taiwan University

Phase Transformations and Microstructural Evolution — Understanding Phase Transformations using APT and Other Complimentary Techniques

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Soumya Nag, University of North Texas; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama ; Amy Clarke, Los Alamos National Laboratory; Frederic Danoix, CNRS - Université de Rouen; Emmanuelle Marquis, University of Michigan

Tuesday PM	Room: Swan 3
March 17, 2015	Location: Swan

Session Chairs: Soumya Nag, GE Global Research Center; Rajarshi Banerjee, University of North Texas

2:00 PM

The Study of Structural and Compositional Characteristics of Omega Phase in Beta Titanium Alloys: Yufeng Zheng¹; Robert Williams¹; Deep Choudhuri²; Talukder Alam²; Rajarshi Banerjee²; Hamish Fraser¹; ¹The Ohio State University; ²University of North Texas

2:20 PM

Competing Mechanisms of Homogeneous and Discontinuous y' Precipitation in Ni-Al-Co Alloys: Tanaporn Rojhirunsakool¹; Soumya Nag²; Jaimie Tiley3; Rajarshi Banerjee1; 1University of North Texas; 2GE Global Research Center; 3Air Force Research Laboratory

2:40 PM

On the Temporal Evolution of the Gamma (f.c.c.)- and γ '(L12)-Phases in a Ni-12.5 Al at.% Alloy: Elizaveta Plotnikov1; Daniel Cecchetti1; Mehmet Yildirim¹; Zugang Mao¹; Yongsheng Li¹; Ronald Noebe²; David Seidman¹; ¹Northwestern University; ²NASA Glenn Research Center

3:00 PM

Coupled Electron Back Scattered Diffusion and Focused Ion Beam Techniques for Atom Probe Tomography Specimen Preparation: Frederic Danoix¹; Claire Debreux¹; Fabien Cuvilly¹; Thomas Sourmail²; Nathalie GEY³; ¹CNRS - Université de Rouen; ²Ascometal CREAS; ³Laboratoire LEM3

3:20 PM Break

3:40 PM

Ouantification of Solute Segregation in the Design of Nanocrystalline Alloys: Monica Kapoor¹; Brad Boyce²; Kristopher Darling³; Gregory Thompson¹; ¹University of Alabama; ²Sandia National Laboratories; ³U.S. Army Research Laboratory

4:00 PM Invited

Comparison of Thermodynamic Database Models and APT Data for High Nb Content γ-γ' Ni-Base Superalloys: Stoichko Antonov¹; Sammy Tin¹; ¹Illinois Institute of Technology

4:30 PM

Morphological and Compositional Evolution of Omega Precipitates in a High Misfit Ti-V Alloy: Deep Choudhuri¹; Talukder Alam¹; Rongpei Shi²; Yufeng Zheng²; Soumya Nag¹; Yunzhi Wang²; Hamish Fraser²; Rajarshi Banerjee1; 1University of North Texas; 2Ohio State University

4:50 PM

Crystallization Behavior of a Zr41.2Ti13.8Cu12.5Ni10Be22.5 Bulk Metallic Glass – A Correlative Atom Probe Tomography Study: Sanghita Mridha1; David Jaeger1; Rajarshi Banerjee1; Sundeep Mukherjee1; 1University of North Texas

Polycrystalline Materials: Bringing Together Experiments, Simulations, and Analytic Theories – Session IV

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Dana Zöllner, Otto von Guericke University Magdeburg; Douglas Medlin, Sandia National Laboratories; Dmitri Molodov, RWTH Aachen

Tuesday PM	Room: Oceanic 8
March 17, 2015	Location: Dolphin

Session Chairs: David Rowenhorst, Naval Research Lab; Katayun Barmak, Columbia University

2:00 PM Invited

Grain Growth and the Puzzle of Its Stagnation in Metallic Films: Experiment, Simulation and Analytic Theory: Katayun Barmak¹; ¹Colubmia University

2:30 PM

Self-Similar Grain Growth in Nanocrystalline Two-Dimensional Polycrystals and Thin Films: *Dana Zöllner*¹; Peter Streitenberger¹; ¹Otto von Guericke University Magdeburg

2:50 PM

FUESDAY PM

Case Studies of the Temperature Dependence of Grain Boundary Mobility: Christopher O'Brien¹; Stephen Foiles¹; ¹Sandia National Laboratories

3:10 PM

Crystallographic Trends of Energy and Mobility in Incoherent Twin Boundaries: *Eric Homer*¹; Jonathan Priedeman¹; Cameron Rogers¹; ¹Brigham Young University

3:30 PM

A Coarse-Grained Atomistic Study of the Stability of Nanotwinned Cu Structures: Shuozhi Xu¹; *David McDowell*¹; Rui Che²; Liming Xiong²; Youping Chen²; ¹Georgia Institute of Technology; ²University of Florida

3:50 PM Break

4:10 PM Invited

Three Dimensional Analysis of Grain Boundary Curvatures and Anisotropies during Grain Growth: David Rowenhorst¹; Amanda Levinson¹; ¹US Naval Research Laboratory

4:40 PM

A Phase Field Model for the Inclusion of Solute Effects and Anisotropy: *Philip Goins*¹; Elizabeth Holm¹; ¹Carnegie Mellon University

5:00 PM

Atomistic Modeling for Grain Boundary (Segregation) Engineering: Exploiting Micro- and Macro-Scale Interfacial Structure-Property Relationships: *Mark Tschopp*¹; Kiran Solanki²; Fei Gao³; ¹Army Research Laboratory; ²Arizona State University; ³Pacific Northwest National Laboratory

5:20 PM

Defect Character at Grain Boundary Facet Junctions: A Combined HAADF-STEM and Atomistic Modeling Study of an Asymmetric S=5 Grain Boundary in Fe: *Douglas Medlin*¹; K. Hattar¹; J. Zimmerman¹; F. Abdeljawad¹; S. Foiles¹; ¹Sandia National Laboratories

Rare Metal Extraction & Processing 2015 — Vanadium-Molybdenum-Tungsten

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee *Program Organizers:* Neale Neelameggham, Ind LLC; Shafiq Alam, University of Saskatchewan; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto Kennecott Utah Copper

Tuesday PM March 17, 2015 Room: Asbury C Location: Yacht & Beach

Session Chairs: Harald Oosterhof, Umicore; Bing Li, East China Univ of Science & Technology

2:00 PM

A Novel Technology of Vanadium Extraction from Stone Coal: *Mingyu Wang*¹; Bowen Li²; ¹Central South University ; ²Michigan Technological University

2:20 PM

Mechanical Activation of Processing of Egyptian Wolframite: Aly Abdel-Rehim¹; ¹Alexandria University

2:40 PM

Leaching of Vanadium from the Roasted Vanadium Slag with High Calcium Content by Direct Roasting and Soda Leaching: Xiao-Man Yan¹; Bing Xie¹; Lu Jiang¹; Hong-Yi Li¹; Hai-Peng Guo¹; ¹Chongqing University

3:00 PM

Solvent Extraction of Vanadium from Converter Slag Leach Solution by P204 Reagent: Zhang Ying¹; Zhang Ting'an¹; Lv Guozhi¹; Liu Yan¹; Zhang Guoquan¹; Liu Zhuolin¹; ¹Northeastern University

3:20 PM Break

3:35 PM

Recovery of Tungsten from Machining Waste Alloy Scrap: *Rahul Kumar*¹; ¹National Institute of Technology, Jamshedpur,

3:55 PM

Establishment and Application of Activity Model Based on FeO-SiO₂-V,O₂-TiO, System: Zhenyu Zhou¹; ¹Chongqing University

4:15 PM

Effect of Solution Compositions on Optimum Redox Potential in Bioleaching of Chalcopyrite by Moderately Thermophilic Bacteria: *Hongbo Zhao*¹; Jun Wang¹; Wenqing Qin¹; Guanzhou Qiu¹; ¹Central South University; Key Lab of Biohydrometallurgy of Ministry of Education

Recent Developments in Biological, Structural and Functional Thin Films and Coatings — Session IV

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee *Program Organizers:* Adele Carradò, IPCMS; Heinz Palkowski, Clausthal Univ of Technology; Roger Narayan, University of North Caroloina; Nuggehalli Ravindra, New Jersey Institute of Technology;

Caroloina; Nuggehalli Ravindra, New Jersey Institute of Technology; Nancy Michael, University of Texas at Arlington

Tuesday PM	Room: Parrot
March 17, 2015	Location: Swan

Session Chair: Nuggehalli Ravindra, New Jersey Institute of Technology

2:00 PM Keynote

Magnetic, Magneto-Transport and Optical Properties in Arrays of Magnetic Iron Oxide or Metallic Nanoparticles: Sylvie Begin¹; Benoit Pichon¹; ¹IPCMS

2:40 PM

Deposition Dynamics of Polymer-Grafted Nanoparticles for Membranes and Protective Coatings: *John Howarter*¹; Logan Kearney¹; Kai Gao¹; ¹Purdue University

3:00 PM

Deposition and Characterization of FeAlCr Thin Films by Magnetron Sputtering: *Kátia Cardoso*¹; Douglas Neves¹; Juliano Libardi²; Argemiro Sobrinho²; Marcos Massi¹; Jose Gonzalez Carrasco³; ¹Universidade Federal de São Paulo - UNIFESP; ²Instituto Tecnológico de Aeronáutica; ³CENIM - CSIC

3:20 PM Invited

AFM Techniques for Nanomechanical Characterization of Thin Coatings: Daniele Passeri¹; Melania Reggente¹; Livia Angeloni¹; Emanuela Tamburri²; Maria Letizia Terranova²; *Marco Rossi*¹; ¹Sapienza University of Rome; ²University of Rome Tor Vergata

3:50 PM Break

4:10 PM

Effect of Microstructure and Composition on the Mechanical Behavior of Nanotwinned CuAl: *Nathan Heckman*¹; Andrea Hodge¹; ¹University of Southern California

4:30 PM Invited

Robust Ultralow-k Dielectrics for Advanced Chip Interconnect: Integration Challenges and Thermo-Mechanical Reliability: Choong-Un Kim¹; *Yoonki Sa*¹; Akanksha Pandey²; Sean King³; Todd Ryan⁴; ¹UTA; ²University of Texas, Arlington; ³Intel Co. ; ⁴Globalfoundries

Strip Casting of Light Metals — Modeling and Properties

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee, TMS: Magnesium Committee

Program Organizers: Kai Karhausen, Hydro Aluminium Rolled Products GmbH; Wim Sillekens, European Space Agency; Murat Dundar, Assan Aluminium; Jan Bohlen, Helmholtz-Zentrum Geesthacht; Dietmar Letzig, MagIC - Magnesium Innovation Centre, Helmholtz-Zentrum Geesthacht Zentrum für Material- und Küstenforschung GmbH

Tuesday PM	Room: Northern Hemisphere E2
March 17, 2015	Location: Dolphin

Session Chairs: Dietmar Letzig, Helmholtz-Zentrum Geesthacht; Murat Dundar, Assan Aluminium

2:00 PM Invited

Modelling of the Twin Roll Casting Process including Friction: *Dag Mortensen*¹; Hallvard Fjær¹; Dag Lindholm¹; Kai Karhausen²; Jakob Kvalevåg²; ¹Institute for Energy Technology; ²Hydro Aluminium Rolled Products

2:20 PM

Twin Roll Casting of Magnesium Strip at CanmetMATERIALS -Modeling and Experiments: Amjad Javaid¹; *Jeremy Hanke*²; Hari Simha¹; Mark Kozdras¹; ¹CANMET Materials; ²CD-Adapco

2:40 PM

Microstructure Evolution of Different Magnesium Alloys during Twin Roll Casting: *Gerrit Kurz*¹; Joachim Wendt¹; Jan Bohlen¹; Dietmar Letzig¹; ¹Helmholtz-Zentrum Geesthacht

3:00 PM

Effect of Cu Addition on the Microstructural Constituents and Mechanical Properties of Twin Roll Cast AlFeMnSi Alloys: *Onur Meydanoglu*¹; Onur Birbasar¹; Ali Ulus¹; Baris Beyhan¹; Eren Kalay²; ¹Assan Aluminum; ²Middle East Technical University

3:20 PM Break

3:40 PM

The Microstructure and Texture Development during Twin-Roll Casting and Rolling of Magnesium Alloy AZ31: *Jan Bohlen*¹; Sangbong Yi¹; Jose Victoria-Hernandez¹; Norbert Schell¹; Bernd Schwebke²; Heinz-Guenter Brokmeier²; Gerrit Kurz¹; Dietmar Letzig²; ¹Helmholtz-Zentrum Geesthacht; ²TU Clausthal

4:00 PM

Improvement of Corrosion Resistance in Modified 3003 Aluminum Alloys Produced by Twin-Roll Casting under Different Casting Parameters: *Mert Günyüz*¹; Hatice Mollaoglu Altuner¹; Ali Ulus¹; ¹Assan Aluminyum A.S.

4:20 PM

The Impact of Cast Structure on the Bend Surface Roughening of Roll Cast 3003 H-24 Sheet: *Dionisios Spathis*¹; John Tsiros¹; ¹Hellenic Aluminium Industry (ELVAL SA)

4:40 PM Concluding Comments

2015 Functional Nanomaterials: Energy and Sensing — Nanomaterial Fabrication I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee

Program Organizers: Jung-Kun Lee, University of Pittsburgh; Behrang Hamadani, National Institute of Standards and Technology; Sung Hun Wee, HGST, a Western Digital Company; Nitin Chopra, University of Alabama, Tuscaloosa; Terry Xu, The University of North Carolina at Charlotte; Jang-Sik Lee, Pohang University of Science and Technology (POSTECH)

Wednesday AM	Room: Swan 4
March 18, 2015	Location: Swan

Session Chair: Jang-sik Lee, Postech

8:30 AM

A Statistical Optimization of Co/Pd Multilayers Bit-Patterned via Block Copolymer Lithography: *Allen Owen*¹; Angelique Montgomery¹; Robert Douglas¹; Hao Su¹; Subhadra Gupta¹; ¹The University of Alabama

8:50 AM

Current Issues on Establishment of Structure-property Relations of Boron Carbon One-Dimensional Nanostructures: *Zhiguang Cui*¹; Youfei Jiang¹; SiangYee Chang¹; Terry Xu¹; ¹UNC Charlotte

9:10 AM Invited

Exploitation of Nanostructured Charge Collecting Materials for Next Generation Perovskite Solar Cells: *H Jung*¹; ¹Sungkyunkwan University

9:30 AM

Low Temperature Atomic Layer Deposited ZrO₂ Films Using TDMA-Zr, H₂O and O₃: *Young-Chul Byun*¹; Lucero Antonio¹; Jiyoung Kim¹; ¹The University of Texas at Dallas

9:50 AM Break

10:05 AM

Cation Diffusion in Metal Hexaborides and the Prospect of Solid State Hydrogen Storage: James Cahill¹; Joel Bahena¹; Michael Alberga²; Victor Vasquez³; Doreen Edwards²; Olivia Graeve¹; ¹University of California, San Diego; ²Alfred University; ³University of Nevada, Reno

10:25 AM

Silver Nanowire - Molybdenum Oxide Nanocomposite Electrodes for Organic Light Emitting Diodes: Sahin Coskun¹; Guler Kocak¹; Ali Cirpan¹; *Husnu Unalan*¹; ¹Middle East Technical University

10:45 AM

Surface Plasmons Resonance Properties of Ag-Cu Alloy Nanoparticles: *Ziye Xiong*¹; Jung-Kun Lee¹; ¹University of Pittsburgh

11:05 AM

The Effect of Electron Beam Induced Deposition (EBID) and Electron Beam Irradiation (EBI) on Measurement of Mechanical Properties of One-Dimensional Nanostructures: *Youfei Jiang*¹; Zhiguang Cui¹; Terry Xu¹; ¹UNC Charlotte

11:25 AM

Synthesis and Characterization of Amorphous Si3N4 Nanoparticles and α-Silicon Nitride Nanowires: *Qi Wang*¹; Hongmin Zhu¹; Jungang Hou¹; ¹University of Science and Technology Beijing

11:45 AM

FePtCu Bit Patterned Media Using Block Copolymer Lithography: Hao Su¹; Allen Owen¹; Angelique Montgomery¹; Subhadra Gupta¹; ¹The University of Alabama

6th International Symposium on High Temperature Metallurgical Processing — Materials Preparation

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Gerardo Alvear, Xstratatech; Onuralp Yucel, Istanbul Technical University; Xinping Mao, Wuhan Iron and Steel Corporation; Hong Yong Sohn, University of Utah; Naiyang Ma, ArcelorMittal; Phillip Mackey, P.J. Mackey Technology; Tom Battle, Midrex Technologies

Vednesday AM	
March 18, 2015	

Room: Swan 5 Location: Swan

Session Chairs: Onuralp Yücel, ITU; Xinping Mao, Wuhan Iron and Steel Corporation

8:30 AM

Ν

Effect of Cooling Speed and Varying Strain Rate on the Second Ductility Minima in Microalloyed, High Manganese Steels: Tobias Brune¹; Dieter Senk1; Steve Münch1; 1RWTH Aachen University

8:50 AM Invited

High Temperature Investigation of Viscosity for FeCrMnNi as-Cast TRIP/ TWIP Steel: Tobias Dubberstein¹; Hans-Peter Heller¹; ¹TU Bergakademie Freiberg

9:10 AM

Production of CrB, Powder via Self Propagating High Temperature Synthesis: Mehmet Bugdayci¹; Buket Tuncer¹; Onuralp Yucel¹; ¹Istanbul Technical University

9:30 AM

Microstructural and Microhardness Analysis of a Diffusion Bonded Titanium Alloy with Titanium Alloy: Chandrappa Kasigavi¹; ¹Siddaganga Institute Of Technology

9:50 AM

Formation of Intermetallic Phases in Al-Sc Alloys Prepared by Molten Salt Electrolysis at Elevated Temperatures: Zengjie Wang¹; Chunyang Guan²; Qiaochu Liu²; Jilai Xue²; ¹Beijing University of Technology; ²School of Metallurgical and Ecological Engineering, University of Science and Technology, Beijing

10:10 AM Break

10:30 AM

Chemical Processing of a High Carbon FeCr Alloy Fine Powder: Eduardo Brocchi¹; Douglas Torres¹; Rogério Navarro¹; Rodrigo de Souza¹; José Brant²; ¹Pontifical Catholic University of Rio de Janeiro; ²Rio de Janeiro State University

10:50 AM

Copper Removal From Ferronickel: Luo Lingen¹; Wang Jianjun²; Peng Jiaqing³; Lin Yinghe³; Li Zhengbang¹; ¹China Iron & Steel Research Institute Group; ²Anhui University of Technology ; ³University of Science and Technology Beijing

11:10 AM

Effects of Austempering Temperature on the Mechanical Properties of S50C Medium Carbon Steel: Cheng-Yi Chen1; Fei-Yi Hung1; Truan-Sheng Lui1; Li-Hui Chen1; 1National Cheng Kung University

11:30 AM

Effect of Arsenic Content and Quenching Temperature on Solidification Microstructure and Distribution of Arsenic in Iron-Arsenic Alloys: Wenbin Xin¹; Bo Song¹; Mingming Song¹; Chuangen Huang¹; ¹University of Science and Technology Beijing

11:50 AM

Preparation of Al-Ti Master Alloys by Aluminothermic Reduction of TiO2 in Cryolite Melts at 960°C: Liu Aimin¹; Xie Kaiyu¹; Li Liangxing¹; Shi Zhongning¹; Hu Xianwei¹; Xu Junli¹; Gao Bingliang¹; Wang Zhaowen¹; ¹Northeastern University of China

12:10 PM

Effect of Non-Metallic Inclusions on the Fatigue Behaviour of Cast ZZnAl10-5: Sha Lv1; 1Central South Unversity

Additive Manufacturing: Interrelationships of Fabrication, Constitutive Relationships Targeting Performance, and Feedback to Process Control -New Frontiers in Additive Manufacturing

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; David Bourell, University of Texas at Austin; Reginald Hamilton, Pennsylvania State University; James Sears, GE Global Research Center; Allison Beese, Pennsylvania State University; Rajiv Mishra, University of North Texas

Wednesday AM	Room: Northern Hemisphere A1
March 18, 2015	Location: Dolphin

Session Chairs: Reginald Hamilton, Pennsylvania State University; Mathieu Brochu, McGill University

8:30 AM Invited

Laser-based AM of Al and Alloys; Tackling the Constraints: Mathieu Brochu1; Jason Milligan1; Ryan Chou1; 1McGill University

9:00 AM

Microstructure and Shape Memory Behavior of NiTi Processed via Laser-Based Direct Energy Deposition Additive Manufacturing: Reginald Hamilton¹; B. Bimber¹; Todd Palmer; ¹Pennsylvania State University

9:20 AM

Microstructural Analysis and Mechanical Evaluation of Ti-45Nb Produced by Selective Laser Melting Towards Biomedical Applications: Sasan Dadbakhsh1; Mathew Speirs1; Ganna Yablokova1; Jean-Pierre Kruth1; Jan Schrooten¹; Jan Luyten¹; Jan Van Humbeeck¹; ¹KU Leuven

9:40 AM

Composition and Microstructure of Direct Metal Laser Sintered 15-5PH Stainless Steel: Kevin Coffy1; Le Zhou1; Yongho Sohn1; 1University of Central Florida

10:00 AM Break

10:20 AM

Friction Stir Additive Manufacturing for High Structural Performance Through Microstructural Control in an Mg Based WE43 Alloy: Sivanesh Palanivel¹; Phalgun Nelaturu¹; Ben Glass¹; Rajiv Mishra¹; ¹University of North Texas

10:40 AM

Influence of Weld Power on Build Quality in Ultrasonic Additive Manufacturing: Adam Hehr1; Marcelo Dapino1; 1The Ohio State University

11:00 AM

Microstructure and Texture Evolution in Dissimilar Material Welds Made Using Very High Power Ultrasonic Additive Manufacturing (VHP UAM): Niyanth Sridharan1; Mark Norfolk2; Sudarsanam Babu1; 1University Of Tennessee Knoxville; ²Fabrisonic

11:20 AM

At Sea Additive Manufacturing: Jennifer Wolk1; Caroline Scheck1; Lonnie Love2; Brock Aron1; Ryan Hayleck1; 1Naval Surface Warfare Center; 2Oak Ridge National Laboratory

11:40 AM

The Effect of Substrate Temperature on Properties of RPA Deposited Maraging 250 for Tooling Repair: *David Schwam*¹; Bryant Walker²; Raymond Walker²; Michael Kottman¹; Bishal Silwal¹; ¹Case Western Reserve University; ²Keystone Synergistic Enterprises

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Dislocations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee *Program Organizers:* Rodney McCabe, Los Alamos National Laboratory; John Carpenter, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Khalid Hattar, Sandia National Laboratory; Irene Beyerlein, Los Alamos National Laboratory; Wolfgang Pantleon, Technical University of Denmark

Wednesday AM	Room: Pelican 2
March 18, 2015	Location: Swan

Session Chairs: Daniel Gianola, University of Pennsylvania; Henning Poulsen, DTU

8:30 AM Invited

Towards the Materials Oscilloscope: In-Situ, Real-time Diffraction on Metals Under Thermo-Mechanical Deformation: *Klaus-Dieter Liss*¹; ¹Australian Nuclear Science and Technology Organisation

9:00 AM

In Situ High Energy Synchrotron X-ray Diffraction Investigation on Deformation Mechanisms in High Mn Steels: Wenwen Song¹; Wolfgang Bleck¹; ¹RWTH Aachen University

9:20 AM

Measuring the Critical Resolved Shear Stress of Various Slip Modes in Hexagonal Ti by 3DXRD: *Leyun Wang*¹; Harsha Phukan²; Peter Kenesei³; Jun-Sang Park³; Thomas Bieler²; ¹Helmholtz-Zentrum Geesthacht; ²Michigan State University; ³Argonne National Laboratory

9:40 AM

Quantification of Dislocation Nucleation Stress in TiN Through High-Resolution In Situ Experiments and First Principles Calculations: Nan Li¹; Satyesh Yadav¹; Xiang-Yang Liu¹; Jian Wang¹; Richard Hoagland¹; Amit Misra²; ¹Los Alamos National Laboratory; ²University of Michigan

10:00 AM Break

10:20 AM

Atomic Resolution Energy Dispersive Spectroscopy of Chemical Segregation at Superlattice Extrinsic Stacking Faults in a Ni-Based Disk Alloy: *Tim Smith*¹; Brian Esser¹; Nik Antolin¹; Babu Viswanathan¹; Andrew Wessman¹; Michael Mills¹; ¹The Ohio State University

10:40 AM Invited

Spherical Nanoindentation and Local Crystal Plasticity Modeling of Ti-6Al-4V: Matthew Priddy¹; Jordan Weaver¹; Surya Kalidindi¹; *David McDowell*¹; ¹Georgia Institute of Technology

11:10 AM

Analysis of the Reversible Behaviour of Dislocations in the Pre-Yield Regime Using a Physically Based Model and Advanced Characterization Techniques: *Zaloa Aretxabaleta*¹; Peter van Liempt²; Jilt Sietsma¹; ¹Delft University of Technology; ²Tata Steel Research, Development & Technology

11:30 AM

Size Effects of Coarse Graining on Dislocation Mobility in FCC Crystals: Liming Xiong¹; Xiang Chen¹; David McDowell²; Youping Chen¹; ¹University of Florida; ²Georgia Institute of Technology

11:50 AM

TEM Analysis of IN100 Disk Material Crept Under High Stresses: Jaimie Tiley¹; Sang-Lan Kim²; Krishinamurthy Mahalingam²; John Porter³; Reji John¹; ¹Air Force Research Laboratory; ²UES; ³University of Dayton Research Institute

Advanced Composites for Aerospace, Marine, and Land Applications II — Carbon Fiber Reinforced Composites and Modeling & Simulations

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Tomoko Sano, US Army Research Laboratory; Tirumalai Srivatsan, The University of Akron

Wednesday AM March 18, 2015

Room: Asia 5 Location: Dolphin

Session Chairs: David Saylor, FDA-CDRH-OSEL; Tomoko Sano, US Army Research Laboratory

8:30 AM Invited

Surface Modification of Carbon Fiber Polymer Composites After Laser Structuring: Adrian Sabau¹; Jian Chen¹; Jonaaron Fitzgerald²; Alexandra Hackett²; Gerald Jellison¹; Claus Daniel¹; David Warren¹; Jackie Rehkopf³; ¹Oak Ridge National Laboratory; ²University of Tennessee; ³Plasan Carbon Composite

8:50 AM

Comparing Strengthening Mechanisms of Vapor Grown Carbon Fiber vs. Titanium Carbide Reinforced PM Titanium Metal Matrix Composites: *Franco Staub*¹; Katsuyoshi Kondoh²; Junko Umeda²; Hisashi Imai²; ¹University of California Irvine; ²Osaka University

9:10 AM

Unique Method for Evaluation of Galvanic Corrosion in Impact Damaged Carbon-fiber Composite Core Bare Overhead High-Voltage Conductors: *Eva Hakansson*¹; Paul Predecki¹; Maciej Kumosa¹; ¹University of Denver

9:30 AM

Microstructural Characterization of Fatigue Damage of CFRP in the Very High Cycle Fatigue Regime: *Daniel Backe*¹; Frank Balle¹; Dietmar Eifler¹; ¹University of Kaiserslautern, Institute of Materials Science and Engineering

9:50 AM

Processing and Characterization of Carbon Fiber-Reinforced Silicon Carbide (C/SiC) Matrix Composites: *Singe Tülbez*¹; Arcan Dericioglu¹; ¹Middle East Technical University

10:10 AM Break

10:30 AM

Effective Creep Response and Uniaxial Tension Behavior of Linear Viscoelastic Polymer Composites: *Tian Tang*¹; Sergio Felicelli¹; ¹The University of Akron

10:50 AM

Correlating the Free-Volume Evolution to Plastic Deformation of Highly Cross-Linked Polymers from

Large Scale Coarse-Grained MD Simulations: *Amin Aramoon*¹; Stephen Barr²; Timothy Brietzman²; Christopher Woodward²; Jaafar El-Awady¹; ¹Johns Hopkins University; ²Wright-Patterson Air Force Base

11:10 AM Invited

Molecular Dynamics Assessment of Small Molecule Diffusion in Medical Plastics: David Saylor¹; Christopher Forrey¹; ¹FDA-CDRH-OSEL

Advanced Energy-Efficient Light Metal (AI, Mg, and Ti) Extraction Technologies and Processes — Session I

Sponsored by: TMS: Energy Committee

Program Organizers: James Klausner, US Department of Energy; Adam Powell, INFINIUM, Inc.; Peter McGrail, PNNL; Aldo Steinfeld, ETH Zurich

Wednesday AMRoom: Southern Hemisphere VMarch 18, 2015Location: Dolphin

Session Chair: To Be Announced

8:30 AM Introductory Comments

8:40 AM Keynote

Electrolytic Extraction of Light Metals: The 21st Century Electrochemical Engineering Challenge: *Antoine Allanore*¹; ¹Massachusetts Institute of Technology

9:10 AM

Catalyzed Organo-Metathetical (COMET) Process for Magnesium Production: *Peter McGrail*¹; Phillip Koech¹; Satish Nune¹; Radha Motkuri¹; Leo Fifield¹; Vanda Glezakou¹; Jian Liu¹; ¹Pacific Northwest National Laboratory

9:50 AM

Carbothermal Reduction of Magnesia in a Vacuum Solar-simulated Thermogravimeter: *Boris Chubukov*¹; Aaron Palumbo¹; Majk Brkic²; Zoran Jovanovic²; Aldo Steinfeld²; Alan Weimer¹; ¹University of Colorado; ²ETH Zurich

10:10 AM Break

10:30 AM

Production of Mg and Al-Mg/Mg-Al Alloys from Secondary Aluminum Scrap Using RE-12TM Process: Subodh Das¹; Adam Gesing¹; Raouf Loutfy¹; ¹Phinix, LLC

10:50 AM

Hydrogen Absorption Property of Magnesium Formate by Spillover at the Ambient Temperature: Shota Hirotaki¹; Mitsuo Notomi²; ¹Graduate Meiji University; ²Meiji University

11:10 AM

WEDNESDAY AM

Dual Electrolyte Extraction Electro-Refinery (DEEE) for Aluminum Production: *Chinbay Fan*¹; Jason Garlanger¹; ¹Gas Technology Institute

11:30 AM Invited

Zero Carbon Emission Aluminum Production by Solid Oxide Membrane Based Electrolysis Process: Shizhao Su¹; Xiaofei Guan¹; Uday Pal¹; ¹Boston University

11:50 AM Invited

Pure Oxygen Anodes[™] for Low-Cost Energy-Efficient Zero-Emissions Aluminum Primary Production: Adam Powell¹; Steve Tucker¹; Salvador Barriga¹; Matthew Earlam¹; ¹INFINIUM, Inc.

Advanced Materials in Dental and Orthopedic Applications — Session V

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Elizabeth Trillo, Southwest Research Institue; Grant Crawford, South Dakota School of Mines and Technology

Wednesday AMRoom: Swan 8March 18, 2015Location: Swan

Session Chairs: Grant Crawford, South Dakota School of Mines and Technology ; Terry Lowe, Colorado School of Mines

8:30 AM

Mechanical and Electrochemical Performance of Mg-HA Nanocomposites Fabricated by Combined HSS and SPD: Yan Huang¹; Junyi Li¹; Debao Liu²; Minfang Chen²; ¹Brunel University; ²Tianjin University of Technology

8:50 AM

Animal Models of PMMA-NVP Hydrogels for Orthotropic, Self-Inflating Tissue Expanders: *Jessica Smith*¹; Zamri Radzi²; Jan Czernuszka¹; ¹University of Oxford; ²University of Malaya

9:10 AM

Fabrication and Characterization of Titanium Nano Hydroxyapatite Surface Composites for Osseointegrated Implant Applications: *Francisco Rumiche*¹; Paulo Munante¹; Jossymar Garcia¹; Rolf Grieseler²; Peter Schaaf²; ¹Pontificia Universidad Catolica del Peru; ²Technische Universitat Ilmenau

9:30 AM

Fabrication of Biocompatible Beta-Ti-30Nb-4Sn Alloy Using High Energy Ball Milled Powder: *Abdel-Nasser Omran*¹; ¹Mining and Metallurgical Department, Faculty of Engineering, Al-Azhar University, Egypt

9:50 AM Break

10:10 AM

Fatigue Analysis of Nitinol and Beta Titanium Arch Wires: Janet Gbur¹; Brian Benini¹; John Lewandowski¹; ¹Case Western Reserve University

10:30 AM

Novel Biodegradable Metal-Ceramic Interpenetrating Composites for Bone Implant Applications: *Jae-Young Jung*¹; Steven Naleway¹; Michael Porter²; Marc Meyers¹; Joanna McKittrick¹; ¹University of California San Diego; ²Clemson University

11:10 AM

Nanoscale Mechanical Properties of Apatite Crystals: Arun Nair¹; Scott Muller¹; ¹University of Arkansas

10:50 AM

A Comparative Assessment of Magnetoelectropolishing (MEP) and Anodization (ANO) Based Surface Modification Techniques in Evaluating the Surface, Mechanical and Cellular Responses of Novel Titanium Implant Materials: Vishal Musaramthota¹; Rupak Dua¹; ¹Florida International University

Advances in Solidification of Metallic Alloys under External Fields — Modelling, Experimental Studies and Applications

Sponsored by: TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS: Aluminum Committee, TMS: Solidification Committee *Program Organizers:* Jiawei Mi, University of Hull; Dmitry Eskin, Brunel University

Wednesday AM March 18, 2015 Room: Swan 1 Location: Swan

Session Chairs: Koulis Pericleous, University of Greenwich; Yves Fautrelle, Grenoble Institute of Technology

8:30 AM Invited

Numerical Modeling of Fluid Flow and Solidification Characteristics during Ultrasonic Processing of A356 Alloys: Laurentiu Nastac¹; ¹The University of Alabama

9:00 AM

Melt Flow and Grain Refinement in Al-Si Alloys Solidified Under the Influence of Applied Electric Currents: Dirk Räbiger¹; Yunhu Zhang¹; Vladimir Galindo¹; Sven Franke¹; *Sven Eckert*¹; ¹Helmholtz Zentrum Dresden-Rossendorf

9:20 AM

Development of Al-B-C Master Alloy under External Fields: *Utsavi Joshi*¹; Sreekumar VadakkeMadam¹; Dmitry Eskin¹; Hari-Babu Nadendla¹; ¹Brunel University

9:40 AM

Shocking the Growing Grains during Solidification by Electro-Magnetic Pulses: Theerapatt Manuwong¹; *Wei Zhang*¹; Jiawei Mi¹; ¹University of Hull

10:00 AM Break

10:15 AM

Solidification Structure Refinement of 2205 Duplex Stainless Steels by Pulse Magneto-Oscillation: *Jie Ni*¹; Congsen Wu¹; Honggang Zhong¹; Qijie Zhai¹; ¹ShangHai University

10:35 AM

Simulation of Solidification Process of Steel Ingot Under the Forced Convection Condition: *Senyang Qian*¹; Jieyu Zhang¹; Bo Wang¹; Jian Zhao¹; Jie Ma¹; ¹Shanghai University

10:55 AM

Grain Refinement of Pure Aluminum under External Electromagnetic Field Treatment – Reviews and New Experimental Evidence: *Zhuyuan Liang*¹; Dong Liang¹; Jie Sun¹; Changjiang Song¹; Qijie Zhai¹; ¹Shanghai University

11:15 AM

Separation Mechanism of Primary Silicon from the Hypereutectic Al-Si Melts under Alternating Electromagnetic Field: Xue Haiyang¹; Guoqiang Lv¹; *Ma Wenhui*¹; Yu Jie¹; ¹Kunming University of Science and Technology

11:35 AM

Containerless Rapid Solidification of Ni-Zr Eutectic Alloy within Electrostatic Field: *Liang Hu*¹; Shangjing Yang¹; Liuhui Li¹; Bingbo Wei¹; ¹Northwestern Polytechnical University

Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu — Cast Iron I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Laurentiu Nastac, The University of Alabama; Baicheng Liu, Tsinghua University; Hasse Fredriksson, KTH - Royal Institute of Technology; Jacques Lacaze, Université de Toulouse; Chun-Pyo Hong, Yonsei University; Adrian Catalina, Caterpillar Inc.; Andreas Buhrig-Polaczek, RWTH Aachen University; Daan Maijer, The University of British Columbia; Charles Monroe, University of Alabama at Birmingham; Adrian Sabau, Oak Ridge National Laboratory; Roxana Ruxanda, Emerson Climate Technologies; Alan Luo, The Ohio State University; Subhayu Sen, GEOCENT; Attila Diószegi, Jönköping University, School of Engineering

Wednesday AM	Room: Swan 7
March 18, 2015	Location: Swan

Session Chair: Roxana Ruxanda, Emerson

8:30 AM

Defect Formation Mechanisms in Lamellar Cast Iron related to the Casting Geometry: *Attila Diószegi*¹; Peter Svidró¹; Lennart Elmquist²; Izudin Dugic³; ¹Jönköping University, School of Engineering; ²SinterCast AB; ³Linnaeus University, Faculty of Technology

8:50 AM

Characterization of Directionally Solidified Gray Iron: Amber Genau¹; Elis Rivera-Martinez¹; Tyler Christiansen¹; Adrian Catalina²; ¹University of Alabama at Birmingham; ²Caterpillar Inc.

9:10 AM

A Review of Macro-Microscopic Modeling of Solidification of Castings and Its Application to Cast Iron Solidification: *Dilip Banerjee*¹; ¹NIST

9:30 AM

Age-Strengthening of Cast Iron and Its Effects on Machinability – Review of the Literature: *Von Richards*¹; ¹Missouri University of Science and Technology

9:50 AM

Examination of Austenite Solidification and Spheroidal Graphite Growth in Ni-Fe-C Alloys: *Jingjing Qing*¹; Von Richards¹; David Van Aken¹; ¹Missouri University of S&T

10:10 AM Break

10:30 AM Invited

Control of the As-Cast Microstructure of Nodular Cast Irons: Jacques Lacaze¹; Jon SERTUCHA²; Lena Magnusson Åberg³; ¹Université de Toulouse; ²IK4-Azterlan; ³Elkem AS

10:55 AM Invited

Production of Selected Key Ductile Iron Castings Used in Large-Scale Windmills: *Yung-Ning Pan*¹; Hsuan-Te Lin¹; Chi-Chia Lin¹; Re-Mo Chang²; ¹National Taiwan University; ²MIRDC

11:20 AM Invited

Influence of Cobalt and Nickel on Solidification, Microstructure and Mechanical Properties of Silicon Solution Strengthened Ductile Iron: *Sebastian Fischer*¹; Johannes Brachmann¹; Philipp Weiß¹; Andreas Bührig-Polaczek¹; ¹RWTH Aachen University

11:45 AM

An Overview of Isothermal Coarsening in Hypoeutectic Lamellar Cast Iron: Juan Carlos Hernando¹; Attila Diószegi¹; ¹Jönköping University

Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu — Microstructure Evolution I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Laurentiu Nastac, The University of Alabama; Baicheng Liu, Tsinghua University; Hasse Fredriksson, KTH - Royal Institute of Technology; Jacques Lacaze, Université de Toulouse; Chun-Pyo Hong, Yonsei University; Adrian Catalina, Caterpillar Inc.; Andreas Buhrig-Polaczek, RWTH Aachen University; Daan Maijer, The University of British Columbia; Charles Monroe, University of Alabama at Birmingham; Adrian Sabau, Oak Ridge National Laboratory; Roxana Ruxanda, Emerson Climate Technologies; Alan Luo, The Ohio State University; Subhayu Sen, GEOCENT; Attila Diószegi, Jönköping University, School of Engineering

Wednesday AM	Room: Swan 6
March 18, 2015	Location: Swan

Session Chairs: Hideyuki Yasuda, Kyoto University; Laurentiu Nastac, The University of Alabama

8:30 AM Invited

In-Situ and Time-Resolved Imaging for Knowing Influence of Mg Content on Solidification in Hypereutectic Cast Iron: *Hideyuki Yasuda*¹; Koshiro Yamane²; Akira Sugiyama³; Tomoya Nagira⁴; Masato Yoshiya⁴; Kohei Morishita¹; Akihiro Sato⁵; Kentaro Uesugi⁶; Akihisa Takeuchi⁶; Yoshio Suzuki⁶; ¹Kyoto University; ²IHI Master Metals; ³Osaka Sangyo University; ⁴Osaka University; ⁵IHI; ⁶JASRI / Spring-8

8:55 AM Invited

Modeling of Microstructure Evolution during Alloy Solidification: *Mingfang Zhu*¹; Shiyan Pan²; Dongke Sun³; ¹Southeast University; ²Nanjing University of Science and Technology; ³Shanghai Jiao Tong University

9:20 AM

A Lattice Boltzmann Model for Dendritic Growth Under Natural Convection: *Mohammad Hashemi*¹; Mohsen Eshraghi²; Sergio Felicelli¹; ¹The University of Akron; ²California State University, Los Angeles

9:40 AM

A 3D Numerical Investigation of the Influence of Casting Defects on Channel Segregates: *Shyamprasad Karagadde*¹; Lang Yuan²; Peter Lee¹; ¹University of Manchester; ²GE Global Research

10:00 AM

Novel Tool for Microstructure Prediction of the Investment Castings: Srdjan Milenkovic¹; Mehdi Rahimian¹; Ilchat Sabirov¹; ¹IMDEA Materials Institute

10:20 AM Break

10:40 AM Invited

Simulation of the Columnar-to-Equiaxed Transition due to Dendrite Fragmentation during Alloy Solidification: Mahdi Torabi Rad¹; *Christoph Beckermann*¹; ¹University of Iowa

11:05 AM

Three-Dimensional Grains Envelopes Tracking at the Casting Scale: Salem Mosbah¹; ¹Self-Employed

11:25 AM

Modeling of Dendritic Structure and Microsegregation in Solidification of Al-Rich Quaternary Alloys: *Ting Dai*¹; Mingfang Zhu¹; Weisheng Cao²; Shuanglin Chen²; ¹Jiangsu Key Laboratory for Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University; ²CompuTherm LLC

Advances in Thin Films for Electronics and Photonics — Functional Materials and Oxides

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee *Program Organizers:* Federico Rosei, INRS; Nuggehalli Ravindra, New Jersey Institute of Technology; Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Terry Alford, Arizona State University

Wednesday AM March 18, 2015 Room: Europe 7 Location: Dolphin

Session Chair: Fiorenzo Vetrone, INRS

8:30 AM Invited

Analyses of Thin-Films for Electronic and Photonics via Atom-Probe Tomography: *David Seidman*¹; ¹Northwestern University

9:00 AM

Characterization and Integration of Printed Flexible Strain Sensors: Amit Pandey¹; Pooran Joshi¹; ¹Oak Ridge National Laboratory

9:20 AM Invited

Multilevel Resistive Switching for High Density Non-Volatile Memory Applications: *Ram Katiyar*¹; Yogesh Sharma¹; Geetika Khurana¹; Pankaj Misra¹; ¹University of Puerto Rico

9:50 AM Break

10:10 AM Invited

Phase Coarsening Phenomena in Thin Film Growth: *Ke-Gang Wang*¹; Martin Glicksman¹; ¹Florida Institute of Technology

10:40 AM Invited

Revisiting 'Silicon as a Mechanical Material': *Brad Boyce*¹; ¹Sandia National Laboratories

11:10 AM

A Method for Efficient Transmittance Spectrum Prediction of Transparent Composite Electrodes: Zhao Zhao¹; Aritra Dhar¹; Terry Alford¹; ¹Arizona State University

11:30 AM Invited

Lateral Polar Structures Based on III-Nitrides for Second Harmonic Generation in the UV: *Ramón Collazo*¹; Marc Hoffmann¹; Ronny Kirste¹; Martin Rigler²; Joseph Rajan¹; Seiji Mita³; Isaac Bryan¹; Wei Guo¹; Dorian Alden¹; Lindsay Hussey¹; Michael Gerhold⁴; Marko Zgonik²; Zlatko Sitar¹; ¹North Carolina State University; ²University of Ljubljana; ³HexaTech, Inc.; ⁴Army Research Office

Alloys and Compounds for Thermoelectric and Solar Cell Applications III — Session V

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Franck Gascoin, Ensicaen University of Caen; Stéphane Gorsse, Bordeaux INP; Chih-Huang Lai, National Tsing Hua University; Yoshisato Kimura, Tokyo Institute of Technology; Ce-Wen Nan, Tsinghua University; G. Jeffrey Snyder, California Institute of Technology; Hsin-jay Wu, National Sun Yat-Sen University

Wednesday AM March 18, 2015

Session Chairs: Teruyuki Ikeda, Ibaraki University; Sinn-wen Chen, National Tsing Hua University

Room: Europe 5

Location: Dolphin

8:30 AM Invited

Combinatorial Approach Using Diffusion Couples as a Tool for the Optimization of Thermoelectric Materials: *Philippe Bellanger*¹; Aude Simar¹; Stéphane Gorsse²; Pascal Jacques¹; ¹Université Catholique de Louvain, iMMC, IMAP; ²ICMCB-CNRS

8:55 AM Invited

Enhanced Thermoelectric Properties of Higher Main Group Thallium Tellurides: Quansheng Guo¹; *Holger Kleinke*¹; ¹University of Waterloo

9:20 AM

Diffusion between Mg₂Si and Mg₂Sn Single Crystals: *Qingfeng Xing*¹; T. Riedemann¹; S. Zhou¹; W. Tang¹; T. Lograsso¹; ¹Ames Laboratory

9:40 AM

Preparation and Thermoelectric Properties of Mg₂Si_{0.25}Sn_{0.65}Ge_{0.1} with Doped Ag: *Yukihiro Isoda*¹; Satoki Tada²; Hirofumi Fujiu²; Haruhiko Udono³; Yoshikazu Shinohara¹; ¹National Institute for Materials Science; ²Mitsuba; ³Ibaraki University

10:00 AM Break

10:20 AM Invited

Control and Stability of Nanostructures of Thermoelectric Materials: *Teruyuki Ikeda*¹; ¹Ibaraki University

10:45 AM

Thermal Conductivity in Mg₂X (X=Si,Ge, Sn and Pb) from First Principles: *Aleksandr Chernatynskiy*¹; Simon Phillpot¹; ¹University of Florida

11:05 AM

Study of Feasible Dielectric Layers and Conductive Electrodes for Implementation of Magnesium Silicide-Based Miniaturized Thermoelectric Devices: Codrin Prahoveanu¹; Ana Lacoste¹; Cédric de Vaulx²; Kamel Azzouz²; *Laetitia Laversenne*³; ¹LPSC, Université Grenoble-Alpes, CNRS/IN2P3; ²Valeo Thermal Systems; ³Univ. Grenoble Alpes, Inst NEEL and CNRS, Inst NEEL

11:25 AM Concluding Comments

Alumina and Bauxite — Red Mud Disposal and Utilisation

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Hans-Werner Schmidt, Outotec GmbH

Wednesday AM	Room: Southern Hemisphere IV
March 18, 2015	Location: Dolphin

Session Chair: Benny Raahauge, FLSmidth Minerals

8:30 AM Introductory Comments

8:35 AM

Improved Efficiency of Red Mud Processing Through Scandium Oxide Recovery: *Olga Petrakova*¹; Andrey Panov¹; Sergey Gorbachev¹; Gennadiy Klimentenok¹; Aleksey Perestoronin¹; Sergey Vishnyakov²; Vyacheslav Anashkin²; ¹UC RUSAL; ²Uralpromenergoproekt PLC

9:00 AM

Modern Technologies for Difficult to Filter Substances in Alumina Refinery: Rustam Seytenov¹; Vadim Lipin²; ¹Outotec CIS; ²St. Petersburg State Polytechnical University

9:25 AM

Bauxite Beneficiation Reject Dewatering and Disposal: *Caio van Deursen*¹; ¹Votorantim Metais

9:50 AM Break

10:05 AM

Complex Additives on the Basis of Red Mud for Intensification of Sintering Process and Iron-Ore Pelletizing: *Andrey Panov*¹; Sergey Petrov¹; Sergey Gorbachev¹; Gennadiy Podgorodetskiy²; Vladislav Gorbunov²; ¹RUSAL Engineering & Technology Centre; ²Moscow Institute of Steel and Alloys

10:30 AM

Utilization of the SmartDiver to Improve Control of Settlers, Washers and Tailings Thickeners: *Patrick Morgan*¹; ¹Precision Light and Air

10:55 AM Question and Answer Period

11:25 AM Concluding Comments

Aluminum Alloys: Development, Characterization, and Applications — Casting and Solidification

Sponsored by: TMS Light Metals Division, TMS: Aluminum Processing Committee Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix,LLC; Tongguang Zhai, University of Kentucky

Wednesday AM March 18, 2015 Room: Northern Hemisphere E3 Location: Dolphin

Session Chair: Hiromi Nagaumi, Suzhou Research Institute for Nonferrous Metals

8:30 AM

Statistical and Thermodynamic Optimization of Trace-element Modified Al-Mg-Si-Cu Alloys: *Stefan Pogatscher*¹; Helmut Antrekowitsch²; Marion Werinos²; Gunter Rank³; Anna Kaiß³; Ramona Prillhofer³; Jörg Löffler¹; Peter Uggowitzer¹; ¹ETH Zurich; ²Montanuniversitaet Leoben; ³AMAG rolling GmbH

8:50 AM Invited

The Influence of Cooling Rate and Alloying Elements on the Microstructure Refinement of Al-5Fe Alloy: *Yulin Liu*¹; Ming Liu¹; Lei Luo¹; Li Zhang¹; Yuhua Zhao¹; Jijie Wang¹; Chunzhong Liu¹; ¹Shenyang Aerospace University

9:10 AM

An Alternative Eutectic System for Casting Aluminum Alloys I: Casting Ability and Tensile Properties: Theodoros Koutsoukis¹; Makhlouf Makhlouf¹; ¹Worcester Polytechnic Institute

9:30 AM

An Alternative Eutectic System for Casting Aluminum Alloys II: Modification of the Eutectic Morphology: *Theodoros Koutsoukis*¹; Makhlouf Makhlouf¹; ¹Worcester Polytechnic Institute

9:50 AM Break

10:00 AM Invited

In-Situ Cast-Forming of Al-Mg-Si Aluminium Alloys: Yan Huang¹; Shouxun Ji¹; ¹Brunel University

10:20 AM

Role of Solidification Conditions in Determining the Microstructure of Al-Si-Cu Cast Alloys: Agnes Samuel¹; Saleh Alkahtani²; Khaled Abuhasel²; Fawzy Samuel¹; ¹UQAC; ²Salman bin Abdulaziz University

10:40 AM

Microstructure And Tensile Data of a Very Ductile as Cast Al-21%Si-1.5% Ba Hyper-Eutectic Alloys: *Mohammad Shamsuzzoha*¹; ¹University of Alabama

11:00 AM

Grain Refinement Behavior of Al-Zn-Si Alloy by Inoculation in Hot-Dip Coating: *Wangjun Peng*¹; Guangxin Wu¹; Xuan Dai¹; Jieyu Zhang¹; Weidong Hu¹; Guoding Gao¹; Kuochih Chou¹; ¹Shanghai University

Aluminum Reduction Technology — Materials and Equipment

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pascal Lavoie, LMRC

Wednesday AM March 18, 2015 Room: Southern Hemisphere III Location: Dolphin

Session Chair: Jacques Caissy, Bechtel

8:30 AM Introductory Comments

8:35 AM

External Potshell Insulation: A Multi-Usage Tool in Low Power Pot Operation: *Pierre Reny*¹; Martin Segatz¹; Ingo Eick¹; Katarzyna Mirek-Sliwa¹; Ole Johnny Midtun¹; Jette Hovmand Jørgensen¹; ¹Hydro Aluminium

187

9:00 AM

In-Depth Analysis of Lining Designs for Several 420 kA Electrolytic Cells: Jianfei Zhou¹; *Marc Dupuis*²; ¹Guiyang Aluminum Magnesium Design and Research Institute; ²GéniSim Inc

9:25 AM

Energy Savings Using a Different Anode Rod Design: *Ivar Sousa*¹; ¹Alumar - Alcoa

9:50 AM

New ECL Embedded Service Robot: Towards an Automated, Efficient and Green Smelter: Anne-Gaëlle Hequet¹; Jerôme Guerin¹; ¹ECL

10:15 AM Break

10:30 AM

An Innovative Pot Ramming Machine: *Pascal Cote*¹; Giovanni Pucella¹; ¹STAS inc.

10:55 AM

Primary Aluminium Production is Automation the Key to New Success? *Maarten Meijer*¹; ¹Hencon

11:20 AM

Bath Treatment Plant – Process & Technology Trends: Christophe Bouche¹; André Pinoncely²; Romuald Daligaux¹; Hervé Hite-Prat¹; Fabienne Virieux²; ¹SOLIOS CARBONE; ²Fives Solios

11:45 AM

Standard Development Work in ISO Technical Committee 226 "Materials for the Production of Primary Aluminium": Lorentz Petter Lossius¹; Raymond E. Brown²; Jean-Claude Fischer³; Harald A. Øye⁴; Xujin Xue⁵; Lin Wu⁵; Nigel Turner⁶; Andreas Schnittker⁷; ¹Hydro Aluminium AS; ²Alcoa World Alumina; ³R&D Carbon Ltd.; ⁴NTNU; ⁵Do-Fluoride Chemicals Co., Ltd.; ⁶Koppers EU; ⁷SGL Carbon SE

Biological Materials Science Symposium — Biomimetic Systems III

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Kalpana Katti, North Dakota State University; Rajendra Kasinath, DePuy Synthes Products, LLC; Michael Porter, Clemson University; Francois Barthelat, McGill University

Wednesday AM	Room: Swan 9
March 18, 2015	Location: Swan

Session Chairs: Rajendra Kasinath, DePuy Synthes Products, LLC; Michael Porter, Clemson University

8:30 AM

Bioinspired Design of Light-Harvesting J-Aggregate Nanotubes for Sensor Aapplications: *Jiyu Fang*¹; ¹University of Central Florida

8:50 AM

Enhanced Biocatalytic Property of Room Temperature Doped Cerium Oxide Nanoparticles: Ankur Gupta¹; Soumen Das¹; Sudipta Seal¹; ¹University of Central Florida

9:10 AM

Preliminary In-Vitro Study of Surface Alterations of Subcutaneous Venous Access Ports Exposed to Antineoplastic Drugs and Whole Blood: *Maren Fossum*¹; Emma Strömberg²; Javier Sanchez³; Samuel Rotstein³; Gunilla Björling³; Ragnhild Aune¹; ¹NTNU; ²Royal Institute of Technology (KTH); ³Karolinska Institutet

9:30 AM

Magnetic Assembly of Bioinspired Composites Exhibiting Bouligand Structure: *Wen Yang*¹; Florian Bouville¹; Rafael Libanori¹; Andre Studart¹; ¹ETH Zurich

9:50 AM

Toughening Mechanisms in Naturally-Occurring Helicoidal Composite Materials: Nobphadon Suksangpanya¹; Michael Jones¹; David Kisailus²; *Pablo Zavattieri*¹; ¹Purdue University; ²University of California, Riverside

10:10 AM Break

10:20 AM

Underwater Attachment and Functional Adaptations of River Loach: *Yung-Chieh Chuang*¹; Guan-Lin Liu¹; Po-Yu Chen¹; ¹National Tsing Hua University

10:40 AM

Synthesis of Biomorphic TiO₂ Using Leaf Vein as Template: Jui-Yi Chen¹; Po-Yu Chen¹; ¹National Tsing-Hua University

11:00 AM

Experimental and Computational Characterization of Delamination Resistant Bio-Laminates: *M.D. Nelms*¹; W.D. Hodo²; P.G. Allison²; A.M. Rajendran¹; ¹University of Mississippi; ²U.S. Army ERDC

11:20 AM

Biocompatible Graphene Liquid Cells for High Resolution In-situ Imaging of Biological Matters: *Tolou Shokuhfar*¹; ¹Michigan Technological University

11:40 AM

Behavior of Giant Vesicles in Acoustically-Excited Microchannels: *Ata Dolatmoradi*¹; Bilal El-Zahab¹; ¹Florida International University

Bulk Metallic Glasses XII — Fatigue and Other Properties

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Hahn Choo, Univ of Tennessee; Yanfei Gao, University of Tennessee

Wednesday AM	Room: Asia 4
March 18, 2015	Location: Dolphin

Session Chairs: Jurgen Eckert, IFW Dresden; Cang Fan, Nanjing University of Science and Technology

8:30 AM Invited

Selective Laser Melting of Metallic Glasses: Jurgen Eckert¹; K.G. Prashanth²; S. Scudino²; M. Stoica³; Simon Pauly²; U. Kühn²; ¹IFW Dresden; TU Dresden; ²IFW Dresden; ³IFW Dresden; Politehnica University of Timisoara

8:55 AM

The Fatigue-Property Improvements of Bulk Metallic Glass Substrates with the Existing of Thin-Film Metallic Glasses: *Haoling Jia*¹; Chia-chi Yu²; Weidong Li¹; Jinn Chu²; Yanfei Gao¹; Peter Liaw¹; ¹University of Tennessee; ²National Taiwan University of Science and Technology

9:15 AM

Thermal Imaging During Processing of Metallic Glasses: *Scott Roberts*¹; Douglas Hofmann¹; ¹JPL

9:35 AM Invited

Electron Correlation Microscopy of Bulk-Glass Forming Alloys in the Supercooled Liquid State: Li He¹; Matt Kramer²; Matt Besser²; *Paul Voyles*¹; ¹University of Wisconsin-Madison; ²Ames Laboratory

10:00 AM

Temperature Evolution in Bulk Metallic Glasses Under Different Loading Conditions: *Xie Xie*¹; Junwei Qiao²; Gongyao Wang¹; Yoshihiko Yokoyama³; Karin Dahmen⁴; Peter Liaw¹; ¹University of Tennessee; ²Taiyuan University of Technology; ³Tohoku University; ⁴University of Illinois at Urbana Champaign

10:20 AM Break

10:35 AM Invited

Quantitatively Characterizing the Free-Volume, Interconnecting-Zone and Atomic Cluster in Metallic Glasses: *Cang Fan*¹; C.T. Liu²; P.K. Liaw³; ¹Materials Science and Engineering, Nanjing University of Science and Technology; ²Center for Advanced Structural Matererials, City University of Hong Kong; ³Materials Science and Engineering, University of Tennessee

10:55 AM

Thermomechanical Behavior of Molded Metallic Glass Nanowires: Daniel Magagnosc¹; Golden Kumar²; Jan Schroers³; Daniel Gianola¹; ¹University of Pennsylvania; ²Texas Tech University; ³Yale University

11:15 AM Invited

Phase Separation in Al-Based Amorphous Alloys: Kang Cheol Kim¹; Cham II Kim¹; Won Tae Kim²; *Do Hyang Kim*¹; ¹Yonsei University; ²Cheongju University

11:35 AM Invited

Ferromagnetic Resonance in Soft-Magnetic Metallic Glass Nanowire and Microwire: *Koji Nakayama*¹; Tomoaki Chiba²; Shin Yaginuma³; Susumu Tsukimoto³; Yoshihiko Yokoyama⁴; Toshiyuki Shima²; Shin Yabukami²; ¹WWPI - Advanced Institute for Materials Research, Tohoku University; ²Faculty of Engineering, Tohoku Gakuin University; ³WPI - Advanced Institute for Materials Research, Tohoku University; ⁴Institute for Materials Research, Tohoku University

11:55 AM

Glassy Magnetostrictive Films Prepared by Thermal Spray Method Used for the Torque Sensor: *Kenji Amiya*¹; Masahiro Komaki²; Yasunori Saotome¹; ¹Tohoku University; ²Nakayama Amorphous

CALPHAD-Based ICME Research for Materials Genomic Design — Materials Genome: ICME and CALPHAD-Based Materials Design 4

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Wei Xiong, Northwestern University; Shihkang Lin, National Cheng Kung University; Chao Jiang, Thermo-Calc Software Inc; Shenyang Hu, Pacific Northwest National Laboratory; Wen-dung Hsu, National Cheng Kung University; Sinn-wen Chen, National Tsinghua University; Shuanglin Chen, CompuTherm LLC

Wednesday AM	Room: Northern Hemisphere A2
March 18, 2015	Location: Dolphin

Session Chairs: Shih-kang Lin, National Cheng Kung University; Jiadong Gong, QuesTek LLC; Wei Xiong, Northwestern University; Qing Chen, Thermo-Calc Software AB; Ricardo Komai, Northwestern University

8:30 AM Keynote

Calphad Methodology Applied to Materials Design of Hypoeutectic Al-Si Cast Alloys: *Rainer Schmid-Fetzer*¹; Song-Mao Liang¹; ¹Clausthal University of Technology

9:00 AM Invited

The Role of CALPHAD-Based Tools in an ICME Modeling Infrastructure: *Paul Mason*¹; Kaisheng Wu¹; Chao Jiang¹; Qing Chen²; Johan Bratberg²; Anders Engstrom²; ¹Thermo-Calc Software Inc.; ²Thermo-Calc Software AB

9:25 AM

Re-Assessment of the Mo-Nb, Mo-Re, and Nb-Re Binary Systems: Shuchang Wu¹; Ki-lin Cheng¹; Chuan Zhang²; *Shih-kang Lin*¹; ¹National Cheng Kung University; ²CompuTherm LLC

9:45 AM

Experimental Investigation of Zn-Zr Binary of Zr-Rich Phase Diagram: *Jiajun Luo*¹; Tian Yin¹; Bingyi Bai¹; Jieyu Zhang¹; ¹ShangHai University

10:05 AM Break

10:20 AM Keynote

Phase Equilibria and Thermodynamic Data Repository for Efficient CALPHAD Assessments: Ursula Kattner¹; Carelyn Campbell¹; Robert Chirico¹; Alden Dima¹; ¹National Institute of Standards and Technology

10:50 AM Keynote

Study of the Ti-Mo-Nb-Ta-Zr System Using Diffusion Multiples for the Development of Low-Modulus Ti Alloys: *Zhangqi Chen*¹; Ji-Cheng Zhao¹; ¹The Ohio State University

11:20 AM

Thermodynamic Reassessment of BaO-YO1.5 System: Chongmao Lin¹; ¹Shanghai University

Cast Shop for Aluminum Production — Metal Quality

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pete Forakis, STAS Middle East

Wedne	esda	ay AN
March	18,	2015

Room: Northern Hemisphere E4 Location: Dolphin

Session Chair: George English, Ma'aden Aluminium

8:30 AM Introductory Comments

8:35 AM

Development of a LiMCA Methodology for the Measurement of Inclusions at Different Depths in Molten Aluminium: *Pierre Le Brun*¹; Fabio Taina¹; ¹Constellium Technology Center

9:00 AM

Improvements in LiMCA Technology: Introducing the LiMCA III: *Thomas Buijs*¹; Daniel Gagnon¹; Claude Dupuis²; ¹ABB; ²Rio Tinto Alcan, Arvida Research & Development Centre

9:25 AM

Evaluating the Metal Cleanliness of Al-Si Casting alloys by Fracture Surface Analysis of K-Mold Samples: Brock Robertson¹; Marcos Cardoso²; *Eulogio Velasco*¹; ¹Superior Industries International Inc.; ²Corporativo Nemak S.A. de C.V.

9:50 AM

Molten Metal Treatment Improvements at JW Aluminum Used as a Method to Guarantee Metal Quality: Claude Dube¹; Dawid Smith²; *Brett Hixson*²; ¹JW Aluminum; ²JWAluminum

10:15 AM Break

10:30 AM

The Influence of Melt Charge Materials on Molten Metal Quality at JW Aluminum: Brett Hixson¹; Claude Dube¹; *Dawid Smith*¹; ¹JW Aluminum

10:55 AM

SiC Particle Detection in Liquid Aluminum via Laser-Induced Breakdown Spectroscopy: *Shaymus Hudson*¹; Diran Apelian¹; Robert De Saro²; Joe Craparo²; ¹Worcester Polytechnic Institute; ²Energy Research Company

11:20 AM

Study of Particle Settling and Sedimentation in a Crucible Furnace: *Mark Badowski*¹; Mertol Goekelma²; Johannes Morscheiser³; Thien Dang⁴; Pierre Le Brun⁵; Sebastian Tewes⁶; ¹Hydro Aluminium; ²RWTH Aachen; ³Aleris Rolled Products Germany GmbH; ⁴TRIMET Aluminium SE; ⁵Constellium Technology Center; ⁶Nemak Europe GmbH

Characterization of Minerals, Metals, and Materials — Characterization of Materials Extraction

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chenguang Bai, Chongqing University; Juan Pablo Escobedo, University of New South Wales; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Neves Monteiro, Military Institute of Engineering, IME, Materials Science Department; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal; Jian Li, CanmetMATERIALS

Wednesday AM March 18, 2015

Room: Mockingbird 1 Location: Swan

Session Chairs: Sabriye Piskin, Yildiz Technical University; Simona Murph, Savannah River National Laboratory

8:30 AM

Preparation and Characterization of Single Phase Strontium Borate (SrB6O10) by Mineral Sol-Gel Method: Sabriye Piskin¹; Nazli Elif Sir¹; Aysel Kantürk Figen¹; ¹Yildiz Technical University, Chemical Engineering Department

8:50 AM

Improvement in Performance of Mg-C Refractories as Lining of Vanadium-Extraction Converters: Weijun Huang¹; Xu Lei¹; Shuai Zhang¹; Min Chen¹; ¹Northeastern University

9:10 AM

Analysis on Deep Treatment Effect of Coking Wastewater with 3D Electrode Combined Fenton Reagent: Lei Zhang¹; ¹Wuhan Iron and Steel Company

9:30 AM

Characterization of Steelmaking Desulfurization Slag: *Mallikharjuna Bogala*¹; Mingming Zhang²; Ramana Reddy¹; ¹The University of Alabama; ²ArcelorMittal Global R&D

9:50 AM Break

10:00 AM

WEDNESDAY AM

Development and Characterization of Nanomaterials for Zinc Vapor Capture: Paul Korinko¹; *Simona Murph*¹; ¹Savannah River National Laboratory

10:20 AM

Separation of Roasted Coating and Core in Double-layered Pellet Roasting For Pretreatment of Sulfur and Arsenic-Bearing Gold Concentrate: *Tao Jiang*¹; Xishan Li¹; Yongbin Yang¹; Qian Li¹; Jie Ge¹; ¹Central South University

10:40 AM

Recovery of Rare Earth Metals form Wasted Magnet by Metals: *Yusuke Sudo*¹; Yuki Kuromiya¹; Kazuki Tomiyama¹; Shinya Uchiyama¹; Takashi Nagai¹; ¹Chiba Institute of Technology

11:00 AM

A Novel Technology of Producing Manganese Sulfate as By-Product from Low-Grade Pyrolusite: *Jing Zhan*¹; Zhijian Wang¹; Chuanfu Zhang¹; Xiang Zhang¹; Jiann-yang hwang²; ¹Central South University; ²Michigan Technological University

11:20 AM

Prediction for the Surface Tension of FeO-TiO₂-Ti₂O₃-X(SiO₂, CaO, MgO) Slag Systems: *Yanhui Liu*¹; Xuewei Lv¹; Chenguang Bai¹; ¹School of Materials Science and Engineering, Chongqing University

Characterization of Minerals, Metals, and Materials — Characterization of Non-Ferrous Metals

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee Program Organizers: John Carpenter, Los Alamos National Laboratory; Chenguang Bai, Chongqing University; Juan Pablo Escobedo, University of New South Wales; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Neves Monteiro, Military Institute of Engineering, IME, Materials Science Department; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal; Jian Li, CanmetMATERIALS

Vednesday AM	Room: Macaw 2
March 18, 2015	Location: Swan

Session Chairs: Juan Pablo Escobedo-Diaz, University of New South Wales; Sreeramamurthy Ankem, University of Maryland

8:30 AM

The Influence of Microstructure and Volume Fraction on the Ambient Temperature Creep Deformation Mechanisms of Binary Ti–V Alloys: Zane Wyatt¹; R. Prakash Kolli¹; *Sreeramanurthy Ankem*¹; ¹University of Maryland

8:50 AM

Elastic and Anelastic Properties of Ti-6Al-4V: Effects of Interstitial Elements.: *Sarah Driver*¹; Nicholas Jones¹; David Rugg²; Howard Stone¹; Michael Carpenter¹; ¹University of Cambridge; ²Rolls-Royce plc.

9:10 AM

Characterization of a Controlled Texture Tantalum Plate: *Thomas Buchheit*¹; Ellen Cerreta²; Lisa Deibler¹; Shuh-Rong Chen²; Joseph Michael¹; ¹Sandia National Laboratories; ²Los Alamos National Laboratory

9:30 AM

Mechanical Properties of Microstructural Gradients in the Low Solvus High Refractory (LSHR) Nickel Base Superalloy: Samuel Kuhr¹; Babu Viswanathan¹; Jay Tiley²; Hamish Fraser¹; ¹The Ohio State University; ²Air Force Research Laboratory

9:50 AM

Stress Induced Microstructural Evolution in Haynes 282: *Kinga Unocic*¹; Hong Wang¹; Peter Tortorelli¹; ¹Oak Ridge National Laboratory

10:10 AM Break

10:20 AM

Characterization of Closed-Cell Aluminium Foams Subjected to Compressive Loading: Md Ashraful Islam¹; Md Zakaria Quadir¹; Paul Hazell¹; Gareth Appleby-Thomas²; Juan P. Escobedo-Diaz¹; ¹UNSW Australia; ²Cranfield University

10:40 AM

Microcompression of Nanocrystalline and Amorphous Tungsten-Based Powders: *Emily Huskins*¹; Zachary Cordero²; Christopher Schuh²; Brian Schuster¹; ¹US Army Research Laboratory; ²MIT

11:00 AM

Interfacial Structure and Mechanisms of Precipitate Growth in Al-Cu: Laure Bourgeois¹; *Nikhil Medhekar*¹; Julian Rosalie²; Andrew Smith¹; Matthew Weyland¹; Jian-Feng Nie¹; Christian Dwyer³; ¹Monash University; ²National Institute for Materials Science; ³Forschungszentrum Jülich

11:20 AM

Deformation Mechanisms at Varying Temperatures in Alloy 718 Ni-Base Superalloy: *Donald McAllister*¹; Duchao Lv¹; Hallee Deutchman²; Brian Streich²; Michael Mills¹; ¹The Ohio State University; ²Honeywell Aerospace

11:40 AM

In Situ Transmission Electron Microscopy and Electron Tomography Investigation of Void Healing in an Aluminum Alloy: Miao Song¹; *Kui Du*¹; Shengping Wen²; Zuoren Nie²; Hengqiang Ye¹; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences; ²Beijing University of Technology

Computational Modeling and Stochastic Methods for Materials Discovery and Properties — Computational Materials Design II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Dallas Trinkle, University of Illinois at Urbana-Champaign; Mikhail Mendelev, Ames Laboratory; Adri van Duin, Pennsylvania State University

Wednesday AM	Room: Northern Hemisphere A4
March 18, 2015	Location: Dolphin

Session Chair: Francesca Tavazza, National Institute of Standards and Technology

8:30 AM

Ab Initio Prediction of the Material with Highest Known Melting Point: *Qijun Hong*¹; Axel van de Walle²; ¹CalTech; ²Brown University

8:50 AM

Cooperative and Competing Relations of Structure, Dynamics and Chemical Bonding in Bulk Metallic Glasses: *Reza Mahjoub*¹; Kevin Laws¹; Micahel Ferry¹; ¹University of New South Wales

9:10 AM

DFT Analysis of Structure/Property Relations in Room Temperature Ferroelectrics: *Michael Ashton*¹; Aleksandr Chernatinskiy¹; Susan Sinnott¹; ¹University of Florida

9:30 AM

Molecular Simulation of Ultra-Fast Resistance Switching in Electrometallization Cells: Optimizing Geometry and Processing Conditions: *Alejandro Strachan*¹; Nicolas Onofrio¹; David Guzman¹; ¹Purdue University

9:50 AM Break

10:05 AM

Effects of Grain Size on the Martensitic Phase Transformation of Nano-Polycrystalline NiAl Shape Memory Alloys via Cooling or Strain: Keith Morrison¹; *Mathew Cherukara*¹; Alejandro Strachan¹; ¹Purdue University

10:25 AM

Defect reduced GaN heterostructures: *Marisol Koslowski*¹; Lei Cao¹; ¹Purdue University

10:45 AM

Cantilever Box-Beam Application of Composite Stacking Sequence Optimization Using Adaptive Genetic Algorithm: Daniel Gutierrez¹; Roselita Fragoudakis¹; Michael Zimmerman¹; Anil Saigal¹; ¹Tufts University

11:05 AM

First-Principles Study of Thermionic Emission from Os-Coated Tungsten Cathodes: *Qunfei Zhou*¹; Thomas Balk¹; Matthew Beck¹; ¹University of Kentucky

Computational Thermodynamics and Kinetics — Precipitates

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Maryam Ghazisaeidi, The Ohio-State University; Vidvuds Ozolins, University of California Los Angeles

Wednesday AMRoom: Oceanic 3March 18, 2015Location: Dolphin

Session Chairs: Pascal Bellon, University of Illinois; Dane Morgan, University of Wisconsin - Madison

8:30 AM Invited

Atomistic Modeling of Coarsening Resistance of Nanoprecipitates Induced by Ion Irradiation: *Pascal Bellon*¹; Xuan Zhang¹; Shipeng Shu¹; Robert Averback¹; ¹University of Illinois

9:00 AM

Earliest Stages of Precipitation in fcc Al-Rich Alloys with Realistic Compositions: Xi Zhang¹; Marcel Sluiter¹; ¹TU Delft

9:20 AM

First-Principles Calculations on the β' Precipitate in Binary Mg Alloys: *Anirudh Raju Natarajan*¹; Anton Van der Ven¹; ¹University of California

9:40 AM Invited

Structure and Thermokinetics of Y-Ti-O Precipitates in Nanostructured Ferritic Alloys: *Dane Morgan*¹; Leland Barnard¹; Nicholas Cunningham²; G. R. Odette²; ¹University of Wisconsin - Madison; ²University of California - Santa Barbara

10:10 AM Break

10:25 AM

Interstitial Solutes and Vacancies in α-Fe: Early Stages of Precipitation: Thomas Schuler¹; Maylise Nastar¹; ¹CEA/SRMP

10:45 AM

Numerical Simulation of Precipitation Kinetics of Radiation-Induced Phases in Type 316 Austenitic Stainless Steels: *Jae-Hyeok Shim*¹; Erwin Povoden-Karadeniz²; Ernst Kozeschnik²; Brian Wirth³; ¹Korea Institute of Science and Technology; ²Vienna University of Technology; ³University of Tennessee, Knoxville

11:05 AM

Experimental Determination and Modeling of Carbide Precipitation Sequences in a 2.25Cr - 1Mo Bainitic Steel during Tempering: *Sylvain Dépinoy*¹; Caroline Toffolon-Masclet¹; Anne-Françoise Gourgues-Lorenzon²; Ernst Kozeschnik³; Bernard Marini¹; François Roch⁴; ¹CEA; ²Mines ParisTech; ³Vienna University of Technology; ⁴AREVA

Constitutive Response and Modeling of Structural Materials: An SMD Symposium in Honor of G.T. Gray III's 60th Birthday — Deformation and Damage Evolution

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Neil Bourne, University of Manchester; Eric Brown, Los Alamos National Laboratory; James Williams, Ohio State University; Kenneth Vecchio, University of California- San Diego

Wednesday AM	Room: Asia 2
March 18, 2015	Location: Dolphin

Session Chairs: Juan Pablo Escobedo, University of New South Wales; Oana Cazacu, University of Florida

8:30 AM

Comparison of a New Sin-Hyperbolic Creep Damage Constitutive Model with the Classic Kachanov-Rabotnov Model Using Theoretical and Numerical Analysis: *Mohammad Shafinul Haque*¹; Calvin Stewart¹; ¹University of Texas El Paso

8:50 AM

Atomistic Simulation of Spall Strength and Damage Evolution in Shocked Single and Polycrystalline Tantalum: *Eric Hahn*¹; Tane Remington¹; Diego Tramontina¹; Bruce Remington²; Ramon Ravelo³; James Hammerberg³; Timothy Germann³; Marc Meyers¹; ¹University of California San Diego; ²Lawrence Livermore National Laboratory; ³Los Alamos National Laboratory

9:10 AM

Finite Element Analysis of the Dynamic Crush Response of TRIP Steel Crush Tubes for Crashworthiness: Christopher Kohar¹; Mohammed Cherkaoui²; Haitham El Kadiri³; *Kaan Inal*¹; ¹University of Waterloo; ²Georgia Institute of Technology; ³Mississippi State University

9:30 AM

Micro-Crack Initiation in High-Silicon Cast Iron during Tension Loading: *Keivan Amiri Kasvayee*¹; Ehsan Ghassemali¹; Anders Jarfors¹; ¹Jönköping University

9:50 AM Break

10:10 AM

The Role of the Plastic Flow of the Matrix on the Ductility, Damage Evolution, and Failure Strain of Metallic Materials: *Oana Cazacu*¹; J Alves²; ¹University of Florida; ²University of Minho

10:30 AM

Characterization and Prediction of Severely Deformed Titanium at High Temperatures: Seyedvahid Sajadifar¹; Kambiz Shojaei¹; G. Guven Yapici¹; 'Ozyegin University

10:50 AM

Dynamic Behaviour of a Metastable Austenitic Stainless Steel After Low Rate Deformation: *Matti Isakov*¹; Michael May²; Stefan Hiermaier²; Veli-Tapani Kuokkala¹; ¹Tampere University of Technology; ²Fraunhofer EMI

11:10 AM

Anisotropy in the Transformation Dynamics of Austenite (B2) to Martensite (B19') Associated with Superelasticity in NiTi: Sourav Gur¹; Venkateswara Rao Manga¹; Stefan Bringuier¹; Krishna Muralidharan¹; Frantziskonis George¹; ¹University of Arizona

11:30 AM

Influence of Hydrostatic Pressure on Yield and Deformation in Infiltrated Ceramic Particle Reinforced Metals: *M. Gabriella Tarantino*¹; Ludger Weber¹; Andreas Mortensen¹; ¹École Polytechnique Fédérale de Lausanne (EPFL)

11:50 AM

Inelastic Response of Boron Carbide to Quasi-Static Knoop Indentation: Jerry LaSalvia¹; Vladislav Domnich²; Scott Walck¹; Jonathan Ligda¹; Brian Schuster¹; ¹U.S. Army Research Laboratory; ²Rutgers University

Development of "Weak Links" during the Processing of Metallic Materials — Properties

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Lee Semiatin, US Air Force Research Laboratory; Anthony Rollett, Carnegie Mellon University; Thomas Bieler, Michigan State University; Mark Stoudt, National Institute of Standards and Technology

Wednesday AM	Room: Peacock
March 18, 2015	Location: Swan

Session Chair: Louis Hector, General Motors Corporation

8:30 AM Invited

Developing Statistical Descriptions of Defect-Mediated Structure-Properties Relationships in Metals: Corbett Battaile¹; Brad Boyce¹; Luke Brewer²; Jay Carroll¹; Blythe Clark¹; John Emery¹; Richard Field¹; James Foulk¹; Hojun Lim¹; ¹Sandia National Laboratories; ²Naval Postgraduate School

9:00 AM Invited

Dynamic Damage Evolution at Interfaces in Cu and Its Alloys: *Ellen Cerreta*¹; Saryu Fensin¹; Carl Trujillo¹; George Gray¹; ¹Los Alamos National Laboratory

9:30 AM Invited

(Mesoscale) Driving Forces for Crack Turning in Hard Aluminum Alloys: Armand Beaudoin¹; Mark Messner²; Robert Dodds¹; ¹University of Illinois at Urbana-Champaign; ²Lawrence Livermore National Laboratory

10:00 AM Break

10:15 AM

A Study on Forming Limit Diagram Using a Self-Consistent Crystal Plasticity Model: *Youngung Jeong*¹; Minh-Son Pham¹; Mark Iadicola¹; Adam Creuziger¹; ¹National Institute of Standards and Technology

10:35 AM

Effect of Grain Size and Grain Boundary Microstructure on Fatigue Crack Nucleation in FCC Polycrystalline Materials: *Li Ma*¹; Mark Stoudt¹; Lyle Levine¹; Jeffrey Fong¹; ¹NIST

Drying, Roasting, and Calcining of Minerals — Drying and Calcining

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee Program Organizer: Thomas Battle, Midrex Technologies

Wednesday AM March 18, 2015

Room: Grand Harbor Salon 3 Location: Yacht & Beach

Session Chairs: Neale Neelameggham, Ind LLC; James Sever, Alpha / Omega Engineering

8:30 AM Introductory Comments

8:50 AM

Optimization on Drying of CuCl Residue by Hot Air Using Response Surface Methodology: *Zhanyong Guo*¹; Shaohua Ju¹; Jnhui Peng¹; ¹Kumming Univercity of Science and Technology

9:10 AM

Application of Kumera Steam Dryers in Mineral Processing: *Carl-Gustav Berg*¹; Shaolong Chen¹; Hannu Mansikkaviita¹; ¹Kumera Corporation

9:30 AM

Dielectric Properties and Microwave Drying Characteristics of CiCl Residue: *Zhanyong Guo*¹; Shaohua Ju¹; Jinhui Peng¹; ¹Kumming Univercity of Science and Technology

9:50 AM

Moisture Dependent Dielectric Properties and Microwave Drying Behavior of Zirconium Hydroxide: Aiyuan Ma¹; Zheng Xuemei¹; Zhang Libo¹; Peng Jinhui¹; Li Shiwei¹; Zuo Yonggang¹; ¹Yunnan Provincial Key Laboratory of Intensification Metallurgy, Key Laboratory of Unconventional Metallurgy, Ministry of Education

10:10 AM Break

10:30 AM

Optimization of Microwave Drying of Salt with Response Surface Methodology: Bao Wang¹; Bo Zhang¹; Hui Peng¹; Guo Liu¹; *Ying Xia*¹; Qiang Li¹; ¹Kunming University of Science and Technology

10:50 AM

The Impact of Calcination Conditions on Production of Magnesium by the Magnatherm Process: James Sever¹; ¹Alpha / Omega Engineering

11:10 AM

Calix Calciner, a Green Application in the Production of Magnesium: James Sever¹; ¹Alpha / Omega Engineering

11:30 AM

Modeling and Design of Experiment in Calcination of Magnesites: *Bijoy Chakrabarti*¹; ¹National Institue of Foundry & Forge Technology

11:50 AM

Study on Effect of Untreated and Calcined Olivine on Low Silicon Pellet Production Process and Quality: *Gele Qing*¹; Keng Wu¹; Yingchang Yu¹; Yunqing Tian²; ¹University of Science and Technology Beijing; ²Shougang Research Institute of Technology

Dynamic Probing of Microstructure Evolution in Nanostructured Materials — Low Dimensional Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee Program Organizers: Nan Li, Los Alamos National Laboratory; Caizhi

Zhou, Missouri University of Science and Technology; Dan Gianola, University of Pennsylvania; Marc Legros, CEMES-CNRS

Wednesday AM	Room: Mockingbird 2
March 18, 2015	Location: Swan

Session Chairs: Yong Zhu, North Carolina State University; Sanjit Bhowmick, Hysitron

8:30 AM Invited

Coupled Imaging, Structural and Mechanical Characterization of Nanomaterials: Xiaodong Li¹; ¹University of Virginia

9:00 AM

Effect of Defect Density on the Size Dependent Fracture Strength of Silicon Carbide Nanowires: *Yong Zhu*¹; Guangming Cheng¹; Qingquan Qin¹; Tzu-Hsuan Chang¹; Hanchen Huang²; ¹North Carolina State University; ²Northeastern University

9:20 AM

In Situ Electromechanical Characterization of ZnO and Si Nanowires: *Sanjit Bhowmick*¹; Douglas Stauffer¹; Ryan Major¹; Oden Warren¹; S.A. Syed Asif¹; ¹Hysitron Inc.

9:40 AM

Radiation Effects on Nanomechanics of Low Dimensional Carbon Systems: Joseph Wallace¹; Lin Shao¹; ¹Texas A&M Nuclear Engineering

10:00 AM Break

10:20 AM

Improving the Controllability of Plastic Deformation of Submicron Sized Aluminum by Introducing Alloy Atoms: *Zhangjie Wang*¹; Junhai Xia²; Simon Ringer³; Zhiwei Shan¹; ¹Center for Advancing Materials Performance from the Nanoscale (CAMP-Nano) & Hysitron Applied Research Center in China (HARCC), State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University; ²School of Aerospace, Mechanical & Mechatronic Engineering, The University of Sydney; ³Australian Centre for Microscopy & Microanalysis, and School of Aerospace, Mechanical & Mechatronic Engineering, The University of Sydney

10:40 AM

Plastic Behavior of Single Crystal Gold Pillars up to the Micron Scale by Coarse-Grained Simulation: *Shuozhi Xu*¹; Rui Che²; Liming Xiong³; David McDowell¹; Youping Chen²; ¹Georgia Institute of Technology; ²University of Florida; ³Iowa State University

Electrode Technology for Aluminum Production – Anode Rodding and Inert Anodes

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Arne Ratvik, SINTEF

Wednesday AM	Room: Southern Hemisphere II
March 18, 2015	Location: Dolphin

Session Chair: Egil Skybakmoen, SINTEF

8:30 AM Introductory Comments

8:35 AM

Anode Stub 3D Inspection System: *Jean-Pierre Gagne*¹; Harold Frenette²; Pascal Coté¹; René Minville¹; Rémi St-Pierre¹; ¹STAS; ²Alcoa Canada

9:00 AM

Determination of the Microstructural Creep Properties of Cast Iron Connector at High Temperatures for the Prediction of the Thermo-Mechanical Behavior of Anodic Assemblies: Dmitry Lukovnikov¹; Dany Racine¹; Daniel Marceau¹; Rimma Zhelateleva¹; Denis Laroche²; David Balloy³; ¹University Research Centre on Aluminium (CURAL) - University of Québec at Chicoutimi; ²ARDC Rio Tinto Alcan; ³Laboratoire de Mécanique de Lille, École Centrale de Lille

9:25 AM

Development of a New Approach to Increase the Electrical Performance of Anodic Assemblies: *Simon-Olivier Tremblay*¹; Daniel Marceau¹; Duygu Kocaefe¹; Charles-Luc Lagacé²; Jules Côté²; ¹CURAL-REGAL-UQAC; ²Aluminerie Alouette Inc

9:50 AM

On the Evolution of Steel Stub Thermo-Physical and Thermo-Mechanical Properties during Operational Stage of Anodic Assemblies: Dmitry Lukovnikov¹; Dany Racine¹; Daniel Marceau¹; Rimma Zhelateleva¹; László Kiss¹; Denis Laroche²; David Balloy³; ¹University Research Centre on Aluminium (CURAL) - University of Québec at Chicoutimi; ²ARDC Rio Tinto Alcan; ³Laboratoire de Mécanique de Lille, École Centrale de Lille

10:15 AM Break

10:30 AM

Influence of Partial Substitution of Cu by Various Elements in Cu-Ni-Fe Alloys on Their High-Temperature Oxidation Behavior: *Elena Gavrilova*¹; Gregory Goupil¹; Boyd Davis²; Daniel Guay¹; Lionel Roué¹; ¹INRS-EMT; ²KPM Inc.

10:55 AM

Study On the Bubble Behavior and Anodic Overvoltage of NiFe₂O₄ Ceramic Based Inert Anodes: *Jinjing Du*¹; Bin Wang¹; Yihan Liu¹; Guangchun Yao¹; Zhao Fang¹; Ping Hu¹; ¹Xi'an University of Architecture & Technology WEDNESDAY AM

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11:20 AM

Application of Grey Relational Analysis for Corrosion Rates of Inert Anodes in Aluminum Electrolysis: Qingwei Qin¹; Yanling Xu¹; Jianhong Yang¹; Xin Zheng¹; ¹Wuhan University of Science and Technology

Energy Technologies and Carbon Dioxide Management Symposium 2015 — Metal Processing/ Molten Salt/ Electrochemistry

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee

Program Organizers: Animesh Jha, University of Leeds; Brajendra Mishra, Colorado School of Mines; Eric Peterson, Idaho National Lab; Cong Wang, Northeastern University; Neale Neelameggham, Ind LLC; Donna Guillen, Idaho National Lab; Li Li, Cornell University

Wednesday AM	Room: Grand Harbor Salon 4
March 18, 2015	Location: Yacht & Beach

Session Chairs: Animesh Jha, University of Leeds; Donna Guillen, Idaho National Laboratory; Li Li, Cornell University; Shulan Wang, Northeastern University

8:30 AM

Energy Efficient Separation of Magnetic Alloy from the Carbothermic Reduction of Nkana Cu-Co Concentrates: Yotamu Hara¹; Animesh Jha¹; ¹Leeds University

8:50 AM

LCA Evaluation for Different Treatment Processes of Nickel Laterite Ore: Hongxu Li¹; Shuai Wang¹; Lifeng Zhang¹; Chao Li¹; Xiangxin Hao¹; ¹University of Science and Technology

9:10 AM

Low Temperature Sulphidization of Cu-Co Slag in the Presence of Calcium Sulphide: Yotamu Hara¹; Animesh Jha¹; ¹Leeds University

9:30 AM

The Effect of The Concentration of HF on The Electrical Parameters of Metal-Porous Silicon Direct Hydrogen Fuel Cell: Cigdem Oruc Lus¹; Emine Agcabay1; 1Yildiz Technical University

9:50 AM

A Kinetic Analysis of Acid Leaching of Niobium and Zirconium from Titania Waste Residue Stream: An Energy Efficient Methodology for the Reclamation of Metal Values: Terence Makanyire1; Animesh Jha1; Stephen Sutcliffe2; 1University of Leeds; 2Huntsman Tioxide

10:10 AM Break

10:30 AM

The Optimization Formula Design of CuxZn(1-x)O Infrared Radiation Material and Coating Slurry: Yuhao Ding¹; Hao Bai²; Chao Lian¹; Wei Wei¹; Wenquan Liu3; ¹University of Science and Technology Beijing; ²State Key Laboratory of Advanced Metallurgy; 3China Metallurgical Industry Planning and Research Institute

10:50 AM

The Role of Austenitizing Routines of Pipe Steels during CCS: Anja Pfennig1; 1HTW Berlin

11:10 AM Invited

Design of 3D Nanowire Architectures and Piezocatalysis effect for Efficient Electrochemical Processes: Xudong Wang¹; ¹University of Wisconsin Madison

11:30 AM

Evaluation of Surface Tension for the NaNO₃-KNO₃-Ca(NO₃), System and Its Sub-System: Jifang Xu¹; Jingjing Zhao¹; Jixu Wang²; Jianchao Li³; Kang Wan1; 1Soochow University; 2Shanghai University; 3Vocational and Industry Institute of Hebei

11:50 AM Invited

From Waste to Energy Storage Materials Through High Temperature Molten Salt Technologies: Dihua Wang1; Huayi Yin1; 1Wuhan University

12:10 PM Invited

New Trend of Molten Salt Electrolysis: Preparation of Titanium Carbide-Derived Carbon: Shulan Wang1; Chaopin Wan2; Ziyou Yu2; Xuan Liu3; Li Li4; 1Northeastern University; 2Northeastern University; 3Carnegie Mellon University ; 4Cornell University

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) — Plenary Session I

Sponsored by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Program Organizers: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory; Brian Bliss, Association for Iron and Steel Technology (AIST); Jeffrey Fergus, Auburn University; Ali Memari, Penn State University; Jonathan Motherwell, Jonathan T. Motherwell and Associates, LLC; Carol Russell, Environmental Protection Agency; Emily Sarver, Virginia Tech; Darlene Schuster, AICHE's Institute for Sustainability; Deborah Shields, Colorado State University

Wednesday AM	Room: Grand Harbor North Ballroom
March 18, 2015	Location: Yacht & Beach

Funding support provided by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Session Chair: Brajendra Mishra, Colorado School of Mines

8:30 AM Introductory Comments

8:40 AM Plenary

Global Materials Resource Challenges (Opportunities) for the 21st Century: Diran Apelian1; 1Worcester Polytechnic Institute

9:10 AM Plenary

Sustainability Using Biotechnology for the Chemical Industries: June Wispelwey¹; ¹AIChE

9:40 AM Plenary

Sustainability: A Business Imperative, Not a Moral Sacrifice: Behrooz Fattahi¹; ¹SPE

10:10 AM Break

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) — Advanced Automotive Design

Sponsored by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Program Organizers: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory; Brian Bliss, Association for Iron and Steel Technology (AIST); Jeffrey Fergus, Auburn University; Ali Memari, Penn State University; Jonathan Motherwell, Jonathan T. Motherwell and Associates, LLC; Carol Russell, Environmental Protection Agency; Emily Sarver, Virginia Tech; Darlene Schuster, AICHE's Institute for Sustainability; Deborah Shields, Colorado State University

Wednesday AM	Room: Asbury A
March 18, 2015	Location: Yacht & Beach

Funding support provided by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Session Chair: Neale Neelameggham, Ind LLC

10:30 AM Introductory Comments

10:35 AM

Multi-Material Light Weight Vehicle (MMLV) - Powertrain Materials: Matthew Zaluzec1; Wolfram Buschhaus1; Hong Jiang1; John Sabo2; Mike Barry3; 1Ford Motor Company; 2Magna International; 3BASF

10:55 AM

Comparative LCA Study of Lightweight Auto Parts of MMLV MACH-I Vehicle as per ISO 14040/44 LCA Standards and CSA Group 2014 LCA Guidance Document for Auto Parts: *Lindita Bushi*¹; Tim Skszek²; David Wagner³; ¹Athena Sustainable Materials Institute; ²Cosma International; ³Ford Motor Company

11:15 AM

Light Weight Turbochargers for Cleaner Automobile Transportation: Ji Zhang¹; ¹China Iron and Steel Research Institute Group

11:35 AM

Sustainable Lightweighting: Recycling Considerations for Lightweight and Multimaterial Vehicles: Adam Gesing¹; Subodh Das¹; M Zaluzec²; M Li²; Paul Krajewski³; ¹Phinix, LLC; ²Ford Motor Company; ³General Motors

Fatigue in Materials: Fundamentals, Multiscale Modeling, Life Prediction and Prevention — Crack Propagation and Low Cycle Fatigue

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Antonios Kontsos, Drexel University

Wednesday AM	Room: Australia 3
March 18, 2015	Location: Dolphin

Session Chairs: Tongguang Zhai, University of Kentucky; Daolun Chen, Ryerson University

8:30 AM Keynote

Low Cycle Fatigue of Aluminum-Silicon Alloys for Power-Train Applications: Sugrib Shaha¹; Frank Czerwinski²; Wojciech Kasprzak²; Jacob Friedman¹; *Daolun Chen*¹; ¹Ryerson University; ²CanmetMATERIALS, Natural Resourses Canada

9:10 AM Invited

Low Cycle Fatigue of Nickel-Base Superalloy René 88DT: J.C. Stinville¹; M.P. Echlin¹; W. Lenthe¹; T.M. Pollock; ¹University of California Santa Barbara

9:35 AM

Prediction of Paris' Law Parameters Using Continuum Damage Mechanics: Nicola Bonora¹; *Gentile Domenico*¹; Italo Persechino¹; ¹University of Cassino

9:55 AM

Simulation of Fatigue Crack Deviation in AA7050 T7651 Al Alloy Thick Plates: *Lin Yang*¹; Yan Jin¹; Tongguang Zhai¹; ¹University of Kentucky

10:15 AM Break

10:35 AM Invited

High-Resolution EBSD, Image Correlation, and Crystal Plasticity Analysis Near Propagating Fatigue Cracks in Single- and Bi-Crystals of Al-Cu Alloys: Jacob Hochhalter¹; Thomas Hardin; Vipul Gupta; Eric Homer; ¹NASA Langley Research Center

11:00 AM

Investigating the Plastic Zone at the Tip of a Crack: A 3D Diffraction and Imaging Study Using Synchrotron X-rays: Jason Williams¹; Sudhanshu Singh¹; Peter Kenesei²; John Almer²; Xianghui Xiao²; Francesco De Carlo²; *Nikhilesh Chawla*¹; ¹Arizona State University; ²Advanced Photon Source, Argonne National Laboratory

11:20 AM

Effects of Strain Amplitude, Cycle Number and Orientation on Low Cycle Fatigue Microstructures in fcc Materials Studied by Electron Channeling Contrast Imaging: *Jens Nellessen*¹; Stefanie Sandlöbes¹; Dierk Raabe¹; ¹Max-Planck-Institut für Eisenforschung GmbH

Friction Stir Welding and Processing VIII — Friction Stir Processing

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Rajiv Mishra, University of North Texas; Murray Mahoney, retired from Rockwell Scientific; Yutaka Sato, Tohoku University; Yuri Hovanski, Pacific Northwest National Laboratory

Wedne	esda	ay AM
March	18,	2015

Room: Northern Hemisphere A3 Location: Dolphin

Session Chairs: Richard Fonda, Naval Research Laboratory; Hidetoshi Fujii, Osaka University

8:30 AM Invited

Friction Stir Processing to Improve the Fatigue Properties of Steel: *Saumyadeep Jana*¹; Glenn Grant¹; Rajiv Mishra²; Blair Carlson³; ¹Pacific Northwest National Laboratory; ²University of North Texas; ³General Motors R&D Center

8:50 AM

Friction Stir Processing of Direct-Metal-Deposited 4340 Steel: *Bharat Jasthi*¹; Todd Curtis¹; Christian Widener¹; Michael West¹; Matthew Carriker¹; Ashish Dasgupta²; Robert Ruokolainen³; ¹South Dakota School of Mines and Technology; ²Focus: HOPE; ³Chrysler Group LLC

9:10 AM

Effect of Carbon Nanotube Orientation on Mechanical Properties of Carbon Nanotube Reinforced Aluminum Matrix Composites: Z.Y. Ma¹; Z.Y. Liu¹; B.L. Xiao¹; ¹Institute of Metal Research, Chinese Academy of Sciences

9:30 AM Invited

Laser-Assisted Friction Stir Processing for Controlling Microstructural Evolution in Mg-4Y-3Nd Alloy: *Nilesh Kumar*¹; Rajiv Mishra¹; Raymond Brennan²; Kevin Doherty²; Kyu Cho²; ¹University of North Texas; ²U.S. Army Research Laboratory

9:50 AM Break

10:10 AM

Manufacturing a Surface Composite Material Made of Nanoceramic Particles of TiC and Aluminum Alloy 7075 by Means of Friction Stir Processing: *David Verdera*¹; Pilar Rey¹; Felipe García²; Rocío Saldaña²; ¹AIMEN; ²COMIMSA

10:30 AM

Microstructural Evaluation of Cold Spray Deposited WC with Subsequent Friction Stir Processing: *Tom Peat*¹; Alexander Galloway¹; Tiziana Marrocco²; Naveed Iqbal²; ¹University of Strathclyde; ²TWI

Frustrated Ferroic Materials — Strain Glasses

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Michael Manley, Oak Ridge National Laboratory; Raymundo Arroyave, Texas A & M University; Navdeep Singh, University of Houston

Wednesday AM March 18, 2015 Room: Europe 1 Location: Dolphin

Session Chairs: James Monroe, Texas A&M University; Turab Lookman, Los Alamos National Laboratory

8:30 AM Invited

Strain Glass as A New Class of Smart Materials: *Xiaobing Ren*¹; ¹National Institute for Materials Science

9:00 AM

The Influence of Doping in Martensite on the Strain Glass Transition: Hongxiang Zong¹; Dezhen Xue²; Xiangdong Ding¹; Turab Lookman²; Jun Sun¹; ¹Xi'an Jiaotong University; ²Los Alamos National Laboratory

9:20 AM

Defect Strength and Strain Glass State in Ferroelastic Systems: *Dong Wang*¹; Duchao Lv²; Yipeng Gao²; Xiaobing Ren³; Yunzhi Wang²; ¹Xi'an Jiaotong University; ²The Ohio State University; ³National Institute for Materials Science

9:40 AM Invited

Glassy Behavior in Ferroics: A Network-Like Description for Martensite Glass: Turab Lookman¹; ¹Los Alamos National Laboratory

10:10 AM Break

10:30 AM

Direct Evidence for Local Symmetry Breaking during a Strain Glass Transition: *Yumei Zhou*¹; Dezhen Xue¹; Xiangdong Ding¹; Jun Sun¹; Kazuhiro Otsuka²; Xiaobing Ren²; ¹Xi'an Jiaotong University; ²National Institute for Materials Science

10:50 AM

Evolution of Spontaneous Transition from Strain Glass State in Ti-Ni Alloy: *Yuanchao Ji*¹; Xiaobing Ren¹; Kazuhiro Otsuka²; ¹Xi'an Jiaotong University; ²National Institute of Materials Science

11:10 AM

Slow Dynamics of Strain Glass: Aging, Scaling, Memory and Rejuvenation: *Dezhen Xue*¹; Turab Lookman¹; Xiaobing Ren²; ¹Los Alamos National Laboratory; ²State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University

11:30 AM

Heterogeneous Networks in Defect-Induced Ferroelastic/Martensite Glass: Hongxiang Zong¹; *Xiangdong Ding¹*; Turab Lookman²; Dezhen Xue¹; Yumei Zhou¹; ¹Xi 'an Jiaotong University; ²Los Alamos National Laboratory

High-Entropy Alloys III — Other Properties I

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Michael Gao, National Energy

Technology Lab; Suveen Mathaudhu, University of California Riverside

Room: Oceanic 5

Location: Dolphin

Wednesday AM March 18, 2015

WEDNESDAY AM

Session Chairs: Ralph Spolenak, ETH Zurich; Hongbin Bei, Oak Ridge National Laboratory

8:30 AM Invited

Refractory High Entropy Alloys - Size, Grain Boundaries and High Temperature: *Ralph Spolenak*¹; ¹ETH Zurich

8:50 AM

Stability of High Entropy Alloys for Use in Next Generation of Nuclear Reactors: *Simon Middleburgh*¹; Daniel King¹; Gregory Lumpkin¹; Lyndon Edwards¹; Michael Cortie²; ¹Australian Nuclear Science and Technology Organisation; ²University of Technology

9:10 AM

Al-Co-Cr-Fe-Ni Phase Equilibria and Properties: *Zhi Tang*¹; Oleg Senkov²; Chuan Zhang³; Fan Zhang³; Carl Lundin¹; Peter Liaw¹; ¹The University of Tennessee; ²Air Force Research Laboratory; ³CompuTherm LLC

9:30 AM Invited

In-Situ Deformation and Microstructure Determination of High Entropy Alloys: Hu Yang; Hui Xing; Jian Min Zuo¹; ¹University of Illinois

9:50 AM

Fatigue Behavior of an Al0.1CoCrNiFe High Entropy Alloy: *Bilin Chen*¹; Xie Xie¹; Shuying Chen¹; Ke An²; Peter Liaw; ¹University of Tennessee; ²Oak Ridge National Laboratory

10:10 AM Break

10:25 AM Invited

Investigating the Onset of Plasticity in a FeCrNiCoMn High Entropy Alloy Using Nano-Indentation Technique: *Dong Wu*¹; Chao Zhu¹; T.G. Nieh¹; ¹University of Tennessee

10:45 AM Invited

Flow and Fracture Behavior of a High Entropy Alloy: Yong Zhang¹; Peter Liaw²; *John Lewandowski*³; ¹University of Science and Technology; ²University of Tennessee; ³Case Western Reserve University

11:05 AM

Phase Equilibrium, Microstructure, and High Temperature Oxidation Resistance of Refractory High-Entropy Alloys: *Bronislava Gorr*¹; Hans-Juergen Christ¹; Daniel Schliephake²; Martin Heilmaier²; ¹University Siegen; ²Karlsruher Institut fuer Technologies

11:25 AM Invited

Sigma Phase Formation in High Entropy Alloys: *Ming-Hung Tsai*¹; ¹National Chung Hsing University

11:45 AM Invited

Single Crystal Plasticity of Multi-Component Equiatomic Solid Solution Alloys: *Hongbin Bei*¹; Yanfei Gao²; Easo George²; ¹Oak Ridge National Laboratory; ²The Unversity of Tennessee; Oak Ridge National Laboratory

High-Performance Aerospace Alloys Design Using ICME Approach — Session V

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee *Program Organizers:* Awadh Pandey, Pratt & Whitney; Somnath Ghosh, Johns Hopkins University; Dongsheng Li, Pratt & Whitney

Nednesday AM	Room: Oceanic 6
March 18, 2015	Location: Dolphin

Session Chair: Dongsheng Li, Pratt & Whitney

8:30 AM Invited

Uncertainty Quantification of bcc Fe Single Crystal Plasticity Using Multi-Model Analysis: Aaron Tallman¹; Joel Blumer¹; Sankar Narayanan¹; Zhi Zeng¹; Yan Wang¹; Ting Zhu¹; *David McDowell*¹; ¹Georgia Institute of Technology

9:00 AM

Implementation of the Co-Ta System for the Modeling of Co-Rich Superalloys: *Shengyen Li*¹; Eric Lass¹; Ursula Kattner¹; Carelyn Campbell¹; ¹National Institute of Standards and Technology

9:20 AM

Through-Process Modeling for Al Alloy Design and Process Optimization for Cold Spray Processing: *Danielle Belsito*¹; Baillie McNally¹; Victor Champagne²; Richard Sisson¹; ¹Worcester Polytechnic Institute; ²U.S. Army Research Laboratory

9:40 AM

Investigation on Microstructures and Properties of Ti-Al-Cr-Fe-V-Zr Alloy: *Dong Li*¹; Cheng-Lin Li¹; Song-Xiao Hui¹; Wen-Jun Ye¹; ¹General Research Institute for Nonferrous Metals

10:00 AM

Electronic Structure of Solutes Strengthened (001) Anti-Phase Boundary of Co3(Al, TM) (TM=Ta, Ti and W) L1₂ **Phase:** *William Wang*¹; Shunli Shang¹; Yi Wang¹; Fei Xue²; Xidong Hui²; Qiang Feng²; Zi-Kui Liu¹; ¹The Pennsylvania State University; ²University of Science and Technology Beijing

High-Temperature Electrochemistry II — Corrosion and Molten Salt Science

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Hydrometallurgy and Electrometallurgy Committee *Program Organizers:* Prabhat Tripathy, Idaho National Laboratory; Guy Fredrickson, Idaho National Lab

Wednesday AM	Room: Grand Harbor Salon 2
March 18, 2015	Location: Yacht & Beach

Session Chair: Boyd Davis, Kingston Process Metallurgy Inc.

8:30 AM

Electrochemical Separation of Dy and Nd from Nd Magnet Scrap in a Molten LiCl-KCl: *Hirokazu Konishi*¹; Hideki Ono¹; Eiichi Takeuchi¹; Toshiyuki Nohira²; Tetsuo Oishi³; ¹Osaka University; ²Kyoto University; ³National Institute of Advanced Industrial Science and Technology

9:10 AM

Electrochemistry of Multi-Lanthanide (Gd and La) Mixtures in Molten LiCl-KCl Eutectic: Devin Rappleye¹; Michael Simpson¹; ¹University of Utah

9:40 AM

On The Use of Electrochemical Techniques to Analyze Oxide Ions Content in Molten FLiNaK Media at 600°C: *Miao Shen*¹; Hao Peng¹; Yong Zuo¹; Leidong Xie¹; ¹Shanghai Institute of Applied Physics, Chinese Academy of Sciences

High-Temperature Systems for Energy Conversion and Storage — Solid Oxide Fuel Cell: Recent Developments II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee

Program Organizers: Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Kyle Brinkman, Clemson University; Paul Ohodnicki, National Energy Technology Laboratory; Amit Shyam, Oak Ridge National Laboratory; Jung Pyung Choi, Pacific Northwest National Laboratory

Wednesday AM Room: Grand Harbor Salon 1 March 18, 2015 Location: Yacht & Beach

Session Chairs: Paul Ohodnicki, National Energy Technology Laboratory; Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.

8:30 AM Introductory Comments

8:40 AM

In-Operando XRD of LSCF Cathodes in Humid Air during 700+ h Anode-Supported SOFC Tests: *John Hardy*¹; Jared Templeton²; Chris Coyle¹; Jeff Stevenson¹; ¹Pacific Northwest National Laboratory; ²Washington River Protection Services

9:05 AM Invited

Evaluating Electrophoretically Deposited Cu-Mn-O Spinel Coatings on Stainless Steel Substrates Used in Solid Oxide Fuel Cell Interconnects: Michael Galbo¹; Kyung-Joong Yoon¹; Uday Pal¹; Srikanth Gopalan¹; *Soumendra Basu*¹; ¹Boston University

9:40 AM

Oxidation Induced Aluminum Depletion and Lifetime Prediction of Co Based Coating Alloys: *S. Salam*¹; Y.-D. Zhang¹; H.-F. Wang¹; C. Zhang¹; Z.-G. Yang¹; ¹Tsinghua University

10:05 AM Break

10:25 AM Invited

Durability of Nickel/Zirconia Electrodes at High Humidity Levels at High Temperature: *Olga Marina*¹; ¹Pacific Northwest National Laboratory

11:00 AM

Sintering Issues and Thermo-Chemical Stability of BZCYYb Proton Conductive Electrolyte for SOFCs: Armin Vahid Mohammadi¹; Zhe Cheng¹; ¹Florida International University

Integrative Materials Design II: Performance and Sustainability — Integrated Design for Fatigue and High Temperature Performance

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Materials and Society Committee

Program Organizers: Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Labs; Michael Sangid, Purdue University; Weizhou Li, Caterpillar Inc

Wednesday AM March 18, 2015 Room: Grand Harbor Salon 8 Location: Yacht & Beach

Session Chairs: Michael Sangid, Purdue University; Jamie Kruzic, Oregon State University

8:30 AM Invited

Fatigue Crack Nucleation in bcc Polycrystals; Experimental and Crystal Plasticity Modelling Integration: *Fionn Dunne*¹; Victor Wan¹; ¹Imperial College

8:55 AM Invited

Understanding Damage Mechanisms in Nickel Alloy Disc Rotors: *Mark Hardy*¹; Stephen Williams¹; Daniel Child¹; Robert Goetz²; Christos Argyrakis¹; ¹Rolls-Royce plc; ²Rolls-Royce Corporation

9:20 AM Invited

Life-Limit Engineering of a Turbine-Engine Superalloy – A Life-Cycle Perspective: *James Larsen*¹; Sushant Jha²; Reji John¹; Andrew Rosenberger¹; Dennis Buchanan³; William Porter³; Jay Jira¹; Siamack Mazdiyasni¹; Vikas Sinha⁴; Patrick Golden¹; ¹Air Force Research Laboatory; ²Universal Technology Corporation; ³University of Dayton Research Institute; ⁴UES, Inc.

9:45 AM Invited

Residual Stress and Long-Term Material Performance in Sustainment and Design: *Michael Hill*¹; ¹University of California, Davis

10:10 AM Break

10:30 AM Invited

On Possible Linkages between Microstructural Distribution and Structural Design Allowables: *Rajiv Mishra*¹; ¹University of North Texas

10:55 AM Invited

Elevated Temperature Exposure Effects on Limiting Fatigue Life of Sheet Ti6242S: *Reji John*¹; W. Porter²; Norman Schehl²; Adam Pilchak¹; Dennis Buchanan²; Sushant Jha³; Kumar Jata¹; ¹Air Force Research Laboratory; ²University of Dayton Research Institute; ³Universal Technology Corporation

11:20 AM Invited

Fracture and Fatigue Reliability Predictions for Crack Bridging Materials: Jamie Kruzic¹; ¹Oregon State University

11:45 AM Invited

Microstructure Dependent Determination of Fatigue Crack Initiation and Scatter in Polycrystalline Materials: *Saikumar Yeratapally*¹; Michael Sangid¹; Mark Hardy²; Michael Glavicic³; ¹Purdue University; ²Rolls-Royce PLC; ³Rolls-Royce

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Magnesium Technology 2015 — Forming and Alloy Design

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: Michele Manuel, University of Florida; Martyn Alderman, Magnesium Elektron; Alok Singh, National Institute for Materials Science; Neale Neelameggham, Ind LLC

Wednesday AM March 18, 2015

Room: Northern Hemisphere E2 Location: Dolphin

Session Chairs: James Saal, QuestTek Innovations, LLC; Mesut Varlioglu, John Deere Moline Technology Innovation Center

8:30 AM

The Effects of Plastic Anisotropy in Warm and Hot Forming of Mg Sheet Materials: *Eric Taleff*¹; Aravindha Antoniswamy²; Alexander Carpenter³; Emre Yavuz¹; ¹The University of Texas at Austin; ²Intel Corporation; ³Southwest Research Institute

8:50 AM

Studies on the Magnesium Alloys Cladding In the Plastic Forming Processes (Die Forging and Extrusion) Using as the Clad Layer Corrosion Resistant Aluminum Alloys: *Piotr Korczak*¹; Marek Nowak¹; Bartlomiej Plonka¹; Dariusz Lesniak²; Krzysztof Remsak¹; Sonia Boczkal¹; ¹IMN OML Skawina; ²KPPiMMN AGH

9:10 AM

Deformation Behavior of Rolled Magnesium Slabs and Twin Roll Cast Strips Studied by the Acoustic Emission Technique: *Patrik Dobron*¹; Daria Drozdenko¹; Jan Bohlen²; Dietmar Letzig²; František Chmelík¹; ¹Charles University in Prague; ²Helmholtz-Zentrum Geesthacht

9:30 AM

Effect of Initial Microstructures on Cold-Rollability of RE-Free Magnesium Alloys: *Young Min Kim*¹; Su Mi Jo²; Jun Ho Bae¹; Bong Sun You¹; ¹Korea Institute of Materials Science; ²Korea University of Science and Technology

9:50 AM

Effect of Heat Treatment on Microstructure and Damping Capacity of Twin Roll Cast ZK60 Strip: *Hongmei Chen*¹; Qianhao Zang¹; Jing Zhang¹; Jaehyung Cho²; Yunxue Jin¹; ¹Jiangsu University of Science and Technology; ²Korea Institute of Materials Science

10:10 AM Break

10:30 AM

Effects of Texture and Alloying Elements on Stretch Formability of Mg Alloy Sheets: Byeong-Chan Suh¹; *Jae H. Kim*¹; Jun Ho Bae²; Nack J. Kim¹; ¹Graduate Institute of Ferrous Technology (GIFT), POSTECH; ²Korea Institute of Materials Science (KIMS)

10:50 AM

Progress in Thermodynamic Database Development for ICME of Mg Alloys: Rainer Schmid-Fetzer¹; ¹Clausthal University of Technology

11:10 AM

Simulation of Concurrent Precipitation of Two Strengthening Phases in Magnesium Alloys: *Weihua Sun*¹; Chuan Zhang²; Andrew D. Klarner¹; Weisheng Cao²; Alan A. Luo¹; ¹The Ohio State University; ²CompuTherm LLC

11:30 AM

Strengthening Mechanisms in Mg97Zn1Y2 Alloys: *Zhiqing Yang*¹; Hengqiang Ye¹; ¹Institute of Metal Research

Magnesium Technology 2015 — Wrought

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: Michele Manuel, University of Florida; Martyn Alderman, Magnesium Elektron; Alok Singh, National Institute for Materials Science; Neale Neelameggham, Ind LLC

Wednesday AM	Room: Northern Hemisphere E1
March 18, 2015	Location: Dolphin

Session Chairs: Bin Li, University of Nevada, Reno; Eric Nyberg, Pacific Northwest National Laboratory

8:30 AM

Development of Thin-Walled Magnesium Alloy Extrusions for Improved Crash Performance Based Upon Texture Control: *Bruce Williams*¹; Sean Agnew²; Robert Klein²; Jonathan McKinley¹; ¹Natural Resources Canada; ²University of Virginia

8:50 AM

Role of Zr in the Microstructure Evolution in Mg-Zn-Zr Based Wrought Alloys: Tilak Bhattacharjee¹; *Taisuke Sasaki*¹; Byeong Chan Suh²; Taiki Nakata³; Shigeharu Kamado³; Nack Joon Kim²; Kazuhiro Hono¹; ¹National Institute for Materials Science; ²POSTECH; ³Nagaoka University of Technology

9:10 AM

Effect of Alloy Composition on Microstructure and Strength of Fine Grained Extruded Mg-Zn-Y alloys Containing Quasicrystal Phase: *Alok Singh*¹; Yoshiaki Osawa¹; Hidetoshi Somekawa¹; Toshiji Mukai²; Catherine Parrish³; Donald Shih³; ¹National Institute for Materials Science; ²Kobe University; ³Boeing Research and Technology

9:30 AM

An Extruded and Peak Aged Mg-5Gd-3Y-1Zn-Zr Alloy with High Strength: *Di Wu*¹; Jingli Li¹; Min Hong²; Wenhui Wang³; Rongshi Chen¹; Enhou Han¹; Wei Ke¹; ¹Institute of Metal Research, Chinese Academy of Sciences; ²Shenyang Aerospace University; ³Shenyang Ligong University

9:50 AM Break

10:10 AM

Strengthening in Thermomechanically Processed Magnesium Alloys: Bilal Mansoor¹; Vasanth Chakravarthy Shunmugasamy¹; Raymond Decker²; S.E. LeBeau²; ¹Texas A&M University at Qatar; ²Thixomat Inc.

10:30 AM

Microstructures and Mechanical Properties of Mg-1mol%X Alloys Processed with High-Pressure Torsion: *Hiroyuki Kawabata*¹; Shigeru Kuramoto¹; Keiichiro Oh-ishi¹; ¹Toyota Central R&D labs., inc.

10:50 AM

Dependence of Compression-Tension Loading on Twinning in Wrought Mg Alloy: Daria Drozdenko¹; Jan Bohlen²; Sangbong Yi²; Dietmar Letzig²; František Chmelík¹; Patrik Dobron¹; ¹Charles University in Prague; ²Helmholtz-Zentrum Geesthacht

11:10 AM

Effect of Mn Content on Microstructure and Mechanical Properties of Mg-Al-Ca-Mn Alloys Fabricated by High-Speed Extrusion: *Taiki Nakata*¹; Kazunori Shimizu²; Yasunobu Matsumoto²; Satoru Hanaki²; Shigeharu Kamado¹; ¹Nagaoka University of Technology; ²Sankyo Tateyama, Inc. Sankyo Material-Company

11:30 AM

Effects of Extrusion Processing and Heat Treatment on Mechanical Property and Heat Dissipation Performance of Mg-2.5Nd-1.0Zn-0.5Zr Alloy: *Jixu Wang*¹; Jieyu Zhang¹; Guangxin Wu¹; ¹Shanghai University

Magnetic Materials for Energy Applications V — Soft Magnetic Materials I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Magnetic Materials Committee

Program Organizers: Francis Johnson, GE Global Research; Raju Ramanujan, Nanyang Technological University; Paul Ohodnicki, National Energy Technology Laboratory

Wednesday AM	Room: Grand Harbor Salon 7
March 18, 2015	Location: Yacht & Beach

Session Chairs: Paul Ohodnicki, National Energy Technology Laboratory; Katie Jo Sunday, Drexel University

8:30 AM Invited

New High *B*-FeSiBPCu Based Soft Magnetic Alloys Contributable To Energy-Saving: Akihiro Makino¹; *Parmanand Sharma*¹; ¹Tohoku University

9:00 AM Invited

Grain Size Dependence of Magnetic Anisotropy in Nanocrysalline Soft Magnetic Alloys and Methodologies for Coreloss Reduction: *Naoki Ito*¹; Ryusuke Hasegawa¹; Motoki Ohta¹; Eric Theisen¹; ¹Metglas Inc.

9:30 AM Invited

Soft Magnetic Fe-Based Bulk Metallic Glasses with High Thermoplastic Formability: *Wei Zhang*¹; Xingjie Jia¹; Xuewei Wang¹; Yanhui Li¹; ¹School of Materials Science and Engineering, Dalian University of Technology

10:00 AM

Multiphysics Design of Brushless DC Motors Using Co-Based Nanocomposite Soft Magnets: Josefina Silveyra¹; Michael McHenry; ¹Carnegie Mellon University

10:20 AM Break

10:35 AM

High Strength 49Co-49Fe-2V Material for Generator, Motors and Magnetic Bearings: Martin Butterhof⁴; ¹Vacuumschmelze

10:55 AM

Effect of Processing of Soft-Magnetic Alloy Laminates on their Magnetic Properties: *Tanjore Jayaraman*¹; Stephan Marr¹; Tapan Shah¹; Aleta Wilder²; ¹Carpenter Technology Corporation; ²Center for Energy & Environmental Resources/University of Texas at Austin

11:15 AM

Effect of Electric Current Pulse on Grain Boundary of Grain Oriented Silicon Steel during Primary Recrystallization Annealing: Zheng Lu¹; Lijuan Li¹; xiang Jiang¹; Qijie Zhai¹; ¹Shanghai University

11:35 AM

Magnetic and Structural Comparison of Fe₃O₄ and Al₂O₃ Coated Iron Powders for Electromagnetic Devices: *Katie Jo Sunday*¹; Kris Darling²; Fran Hanejko³; Mitra Taheri¹; ¹Drexel University; ²U.S. Army Research Laboratory; ³Hoeganaes Corporation

11:55 AM

Thin Profile Continuous Silicon Iron Strip from Single-Step Large Shear Deformation: *Andrew Kustas*¹; Srinivasan Chandrasekar²; Kevin Trumble¹; ¹School of Materials Engineering, Purdue University; ²School of Industrial Engineering, Purdue University

Materials and Fuels for the Current and Advanced Nuclear Reactors IV — Structural Materials II

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory

Wednesday AM March 18, 2015 Room: Grand Harbor Salon 6 Location: Yacht & Beach

Session Chair: Robert Odette, University of California, Santa Barbara

8:30 AM

Cracking of Irradiated CF-3 Cast Austenitic Stainless Steel with 24% Ferrite: Yiren Chen¹; *Appajosula Rao*²; Yong Yang³; Bogdan Alexandreanu¹; Ken Natesan¹; ¹Argonne National Laboratory; ²US Nuclear Regulatory Commission; ³University of Florida

8:50 AM

The Role of the Interactions of Dislocation Channels with Grain Boundaries in the Irradiation Assisted Stress Corrosion Cracking Mechanism: *Michael McMurtrey*¹; Ian Robertson²; Diana Farkas³; Gary Was¹; ¹The University of Michigan; ²University of Wisconsin-Madison; ³Virginia Tech

9:10 AM

Characterization of Irradiation Effects in Nanoscale Stable Precipitation-Strengthened Steels: *Clarissa Yablinsky*¹; Osman Anderoglu¹; Semyon Vaynman²; Morris Fine²; Kristin Tippey³; John Speer³; Kip Findley³; Omer Dogan⁴; Paul Jablonski⁴; Stuart Maloy¹; Amy Clarke¹; Kester Clarke¹; ¹Los Alamos National Laboratory; ²Northwestern University; ³Colorado School of Mines; ⁴National Energy Technology Laboratory

9:30 AM

Corrosion of 316L Stainless Steel in Primary Water During In-Situ Proton or Electron Irradiation: *Stephen Raiman*¹; Peng Wang¹; Kotchaphan Kanjana²; David Bartels²; Gary Was¹; ¹University of Michigan; ²University of Notre Dame

9:50 AM

Radiation-Induced Microstructural Effects in Nickel-Chromium Binary Alloys: Samuel Briggs¹; Janne Pakarinen¹; Leland Barnard¹; Dane Morgan¹; Kumar Sridharan¹; Julie Tucker²; Todd Allen³; ¹University of Wisconsin-Madison; ²Oregon State University; ³Idaho National Laboratory

10:10 AM Break

10:30 AM

Neutron Irradiation Studies on Friction Stir Processed ODS Alloys: *Ramprashad Prabhakaran*¹; Y.Q. Wu²; Jatu Burns²; James Cole³; Indrajit Charit¹; R.S. Mishra⁴; K.L. Murty⁵; ¹University of Idaho; ²Boise State University; ³Idaho National Laboratory; ⁴University of North Texas; ⁵North Carolina State University

10:50 AM

Effect of Heavy Ion Irradiation on Microstructural Evolution in CF8 Cast Austenitic Stainless Steel at 300, 350 and 400°C: *Wei-Ying Chen*¹; Meimei Li²; Mark Kirk²; Pete Baldo²; Tiangan Lian³; ¹U of Illinois at Champaign-Urbana; ²Argonne National Laboratory; ³EPRI

11:10 AM

Post-irradiation Annealing of a BWR-Irradiated 304L Stainless Steel and Resultant Mitigation of IASCC Susceptibility: *Justin Hesterberg*¹; Zhijie Jiao¹; Maxim Gussev²; Jeremy Busby²; Gary Was¹; ¹University of Michigan; ²Oak Ridge National Laboratory

11:30 AM

The Role of Localized Deformation in IASCC Initiation of Neutron Irradiated Austenitic Stainless Steel: *Kale Stephenson*¹; Gary Was¹; ¹University of Michigan

11:50 AM

Radiation Effects on the Thermophysical Properties of a New Neutron Absorbing Material: *Donna Guillen*¹; Heng Ban²; ¹Idaho National Laboratory; ²Utah State University

Messaging Research to a Broad Audience — Session I

Program Organizers: Kevin Chaput, Purdue University; Andrew Kustas, Purdue University; Kathlene Reeve, Purdue University; Lisa Rueschhoff, Purdue University

Wednesday AM March 18, 2015 Room: Oceanic 1 Location: Dolphin

Session Chairs: Kevin Chaput, Purdue University; Kathlene Reeve, Purdue University; Lisa Rueschhoff, Purdue University; Andrew Kustas, Purdue University

8:30 AM Invited

The Power of Small Words for Big Impacts: *Michelle Dickinson*¹; ¹Auckland University

9:10 AM Invited

Communicating the Critical Implications of Support for Materials Research on Capitol Hill: Iver Anderson¹; ¹Iowa State University

9:40 AM

NanoHUB.org: An Open-Access Platform for the Dissemination of Models and Tools on the Web: *Tanya Faltens*¹; Alejandro Strachan²; Gerhard Klimeck¹; ¹Purdue/ NCN; ²Purdue/ Materials Science and Engineering

10:00 AM Break

10:20 AM Invited

The Impact of Materials on Society Course: Kevin Jones¹; ¹University of Florida

10:50 AM

Preparing an NSF CAREER Proposal: Alexis Lewis¹; ¹National Science Foundation

MHD 2015: Nagy El-Kaddah Memorial Symposium on Magnetohydrodynamics (MHD) in Materials Processing — Induction Heating and Melting

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Ramana Reddy, The University of Alabama; Thinium Natarajan, U. S. Steel

Wednesday AM	Room: Swan 2
March 18, 2015	Location: Swan

Session Chairs: Mark Weaver, The University of Alabama; Thinium Natarajan, United States Steel

8:30 AM Introductory Comments

8:35 AM Invited

Magnetic Suspension Melting Developments: Valdis Bojarevics¹; Koulis Pericleous¹; ¹University of Greenwich

9:00 AM

On the Influence of Coil Frequency on the Flow in Electromagnetic Solidification Systems: Gregory Poole¹; Laurentiu Nastac²; ¹Purdue University; ²University of Alabama

9:25 AM Invited

Stochastic Mesoscopic Modeling of the Globular Microstructure and Microsegregation Evolution during the Solidification of Cast Mg AZ31B Alloys at Low Superheat: Laurentiu Nastac¹; ¹The University of Alabama

9:50 AM Break

10:05 AM Invited

A New Electromagnetic Heating Method to Study Spray Cooling: Mario Huerta-Larumbe¹; *Francisco Acosta-González*¹; ¹CINVESTAV

10:30 AM Invited

3D Mathematics Model of Formation and Motion of Metal Droplets during Electro-Slag Remelting Process: *Lifeng Zhang*¹; Le Yu¹; ¹University of Science and Technology Beijing

10:55 AM Invited

Mathematical Modeling of the Mold Current and Its Influence on Slag and Ingot Behavior during ESR: Mathilde Hugo¹; *Alain Jardy*¹; Bernard Dussoubs¹; Jessica Escaffre²; Henri Poisson²; ¹Institut Jean Lamour; ²Aubert & Duval

11:20 AM Invited

Application of a Model for Simulating the Vacuum Arc Remelting Process: Ashish Patel¹; 'Timet

Micromechanics of Structurally Inhomogeneous Materials: An FMD Symposium in Honor of Armen Khachaturyan — Thermodynamics and Kinetics of Phase Transformations

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Phase Transformations Committee *Program Organizers:* Long Qing Chen, Penn State University; Mark Asta, University of California, Berkeley; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yongmei Jin, Michigan Technological University; Yann Le Bouar, LEM, CNRS/ ONERA

Wednesday AM	Room: Asia 3
March 18, 2015	Location: Dolphin

Session Chair: Yong Mei Jin, Michigan Tech

8:30 AM Invited

Atomistic Modelling of the Pd-H System: *Ricardo Schwarz*¹; Alfredo Caro¹; Daniel Schwen²; ¹Los Alamos National Laboratory; ²Idaho National Laboratory

9:00 AM Invited

The Third Law of Thermodynamics and Low Temperature Phase Stability: *David Laughlin*¹; William Soffa²; ¹Carnegie Mellon University; ²University of VA

9:30 AM

Atomistic Modeling of Grain Boundary Complexions: Toughening Effects and Interface Thermodynamics: *Zhiliang Pan*¹; Timothy Rupert¹; ¹University of California, Irvine

9:50 AM

Activation of Ferroelastic Toughening in Multi-Phase Ceramics: Jessica Krogstad¹; ¹University of Illinois, Urbana-Champaign

10:10 AM Break

10:30 AM Invited

The Influence of Non-Conventional Pathways for Nucleation on Microstructural Evolution in Titanium Alloys: Yufeng Zheng¹; Robert Williams¹; Gopal Viswanathan¹; Soumya Nag²; Rajarshi Banerjee³; *Hamish Fraser*¹; ¹The Ohio State University; ²GE Global Research Center; ³University of North Texas

11:00 AM Invited

Vibrational Dynamics and Thermodynamics of Nanostructures: *Brent Fult*₂¹; Hillary Smith¹; ¹California Institute of Technology

11:30 AM

Coupling the Nonlinear Transformation Pathway with Phase-Field Microelasticity and Its Application in Finding the Critical Nucleus during a Martensite Transformation: *Pengyang Zhao*¹; Chen Shen²; Ju Li³; Yunzhi Wang¹; ¹The Ohio State University; ²GE Global Research; ³Massachusetts Institute of Technology

Microstructural Processes in Irradiated Materials – Ceramics and Fuels (SiC, UO₂, General Ceramics, and Metal Fuels)

Sponsored by: TMS: Nuclear Materials Committee Program Organizers: Dane Morgan, University of Wisconsin -Madison; Thak Sang Byun, Oak Ridge National Laboratory; Yasuyoshi Nagai, Tohoku University; Zhijie Jiao, University of Michigan; Kai Nordlund, University of Helsinki ; Ming-Jie Zheng, University of Wisconsin

Nednesday AM	Room: Asia 1
March 18, 2015	Location: Dolphin

Funding support provided by: Idaho National Laboratory and Oak Ridge National Laboratory

Session Chairs: Xian-Ming Bai, Idaho National Laboratory; Tatsuya Hinoki, Kyoto University

8:30 AM Invited

Effects of Radiation in Silicon Carbide Ceramics and Composites: Current Understanding of Irradiation Stability and Our Ability to Characterize Irradiation-Induced Miscrostructural Evolution: *Yutai Katoh*¹; Chad Parish¹; Lance Snead¹; Takaaki Koyanagi¹; Alejandro Perez-Bergquist¹; Paul Voyles¹; ¹Oak Ridge National Laboratory

9:00 AM Invited

Structure and Kinetics of "Invisible" Defects in Irradiated SiC: *Izabela Szlufarska*¹; ¹University of Wisconsin

9:30 AM Invited

Constitutive Modeling of Irradiation Effect on Silicon Carbide Composites: *Tatsuya Hinoki*¹; Takaaki Koyanagi¹; Sosuke Kondo¹; ¹Kyoto University

10:00 AM Break

10:15 AM

Ionization-Induced Self-Healing of Ballistic Collision Damage in Silicon Carbide: *William Weber*¹; Ritesh Sachan²; Olli Pakarinen²; Miguel Crespillo¹; Peng Liu¹; Haizhou Xue¹; Yanwen Zhang²; ¹University of Tennessee; ²Oak Ridge National Laboratory

10:30 AM

Ab Initio Study for Resistance to Radiation-Induced Amorphization in ZrC: *Ming-Jie Zheng*¹; Izabela Szlufarska²; Dane Morgan²; ¹Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences, China; ²University of Wisconsin - Madison

10:45 AM Invited

Simulation of Xenon, Uranium Vacancy and Uranium Interstitial Diffusion and Grain Boundary Segregation in UO₂: *David Andersson*¹; ¹Los Alamos National Laboratory

11:15 AM

Influence of Irradiation Induced Point Defects on Thermal Conductivity in UO₂: *Marat Khafizov*¹; Janne Pakarinen²; Lingfeng He²; Aleksandr Chernatynskiy³; Xianming Bai⁴; Andrew Nelson⁵; Simon Phillpot³; Todd Allen⁴; David Hurley⁴; ¹The Ohio State University; ²University of Wisconsin; ³University of Florida; ⁴Idaho National Laboratory; ⁵Los Alamos National Laboratory

11:30 AM

Mesoscale Modeling of Effects of Radiation-Induced Microstructures on Thermal Transport in UO₂: *Xian-Ming Bai*¹; Michael Tonks¹; ¹Idaho National Laboratory

11:45 AM

TEM Study of Restructuring of LWR UO₂ Fuels at Very High Burnup: *Thierry Wiss*¹; Oliver Dieste-Blanco¹; Rudy Konings¹; Vincenzo Rondinella¹; ¹EuropeanCommission - JRC -ITU

12:00 PM

Ion Irradiation Characterization Studies of MAX Phase Ceramics: *Daniel Clark*¹; Steven Zinkle¹; Yanwen Zhang¹; ¹University of Tennessee

Multiscale Microstructure, Mechanics and Prognosis of High Temperature Alloys — Environmental Degradation, Coatings, and Mechanical Properties

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: High Temperature Alloys Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Mark Tschopp, Army Research Laboratory; Jeffrey Evans, University of Alabama in Huntsville; Jonathan Cormier, ENSMA / Institut Pprime - UPR CNRS 3346; Qiang Feng, University of Science and Technology Beijing

Wednesday AM March 18, 2015 Room: Oceanic 7 Location: Dolphin

Session Chairs: Kiran Solanki, Arizona State University; Mark Tschopp, Army Research Laboratory

8:30 AM Invited

Role of Oxygen on Mechanical Properties of High Temperature Materials: A QM/MM Study: *Kiran Solanki*¹; M Bhatia¹; X Zhang²; M Azarnoush¹; G Lu²; ¹Arizona State University; ²California State University Northridge

8:50 AM

Microstructure Evolution of a Platinum-Modified Nickel-Aluminide Coating under Thermo-Mechanical Fatigue: *Pierre Sallot*¹; Vincent Maurel²; Luc Remy²; Franck Nguyen²; Arnaud Longuet³; ¹SAFRAN; ²MINES ParisTech, PSL Research University, MAT - Centre des matériaux, CNRS UMR 7633; ³SAFRAN-Snecma

9:10 AM

Design, Synthesis, and Performance of γ' **Ni**₃**Al Bond Coats**: *David Jorgensen*¹; R Jackson¹; Akane Suzuki²; Don Lipkin²; Tresa Pollock¹; ¹University of California, Santa Barbara; ²GE Global Research

9:30 AM

Creep-Rupture Properties of Ni-Base Superalloy in Marine-Like Environment: *Venkateswararao Mannava*¹; M. Kamaraj¹; S.N. Narendra Babu²; Neeta Paulose²; Ravi S. Kottada¹; ¹Metallurgical and Materials Engineering, IIT Madras; ²Gas Turbine Research Establishment (GTRE)

9:50 AM

High Temperature Oxidation and Hot Corrosion Behavior of Directionally Solidified Rene 80 Ni Superalloy: *Ashok Vayyala*¹; Lakshman Neelakantan¹; M. Kamaraj¹; S N Narendra Babu²; Neeta Paulose²; ¹IIT Madras; ²Gas Turbine Research Establishment (GTRE)

10:10 AM Break

10:30 AM

Mechanical Behavior of a Notched Oxide/Oxide CMC in Combustion Environment: Experiment and Simulations: Nima Rahbar¹; Sina Askarinejad¹; Volodymyr Sabelkin²; Shankar Mall²; ¹Worcester Polytechnic Institute; ²Air Force Institute of Technology

10:50 AM Invited

Thermomechanical Fatigue Behavior of a Ni-Base Superalloy: Influence of Temperature, Dwells, and Aged States: *Michael Kirka*¹; Kyle Brindley¹; Richard Neu¹; Stephen Antolovich¹; Sachin Shinde²; Phillip Gravett²; ¹Georgia Institute of Technology; ²Siemens Energy Inc.

11:10 AM

Abnormal Stress Rupture Property in K465 Superalloy at 900°C: *Xiaofei Yuan*¹; Yunrong Zheng¹; Qiang Feng¹; ¹University of Science and Technology Beijing

11:30 AM

Microstructural Stability in High Refractory Containing Nickel-Base Superalloys: Subhashish Meher1; Mark Carroll1; Laura Carroll1; Tresa Pollock2; 1Idaho National Laboratory; 2University of California, Santa Barbara

Effects of Microstructural Degradation on Creep Behavior of GH4037 Wrought Superalloy: Jinyan Tong1; Koichi Yagi1; Yunrong Zheng1; Qiang Feng1; ¹National Center for Materials Service Safety, University of Science and Technology Beijing

Nano- and Micro-Mechanical Measurements in Harsh Environments — Nanoindentation in Harsh Environments

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee Program Organizers: Peter Hosemann, University of California Berkeley; Jeffrey Wheeler, EMPA; Verena Maier, Erich Schmidt Institut; Douglas Stauffer, Hysitron

Wednesday AM	Room: Oceanic 4
March 18, 2015	Location: Dolphin

Session Chair: Jeffrey Wheeler, EMPA

8:30 AM Invited

High Temperature Nanoindentation of Irradiated Materials: David Armstrong¹; James Gibson¹; Steve Roberts¹; ¹University of Oxford

A Method for Minimizing Oxide Formation during Elevated Temperature Nanoindentation: I-Chung Cheng1; Andrea Hodge1; 1University of Southern California

9:30 AM

A Procedure to Set Up Nano-Indentations at Elevated Temperatures with Isothermal Contact between the Indenter and the Sample in Thermal Equilibrium: Xiaodong Hou1; 1National Physical Lab, UK

9:50 AM

WEDNESDAY AM

Use of Nanoindentation at High Temperature to Evaluate the Mechanical Properties of Materials: Manuel Abad¹; Zijing Huang¹; Marisa Rebelo de Figueiredo1; Susanne Koch1; Amanda Lupinnacci1; David Frazer1; Ashley Reichardt1; Peter Hosemann1; 1University of California Berkeley

10:10 AM Break

10:30 AM Invited

Micro- and Nanomechanical Testing under Sumulated Environmental Conditions: Afrooz Barnoush1; 1NTNU

11:10 AM

The Effects of Solute Hydrogen in FCC Metals Probed with Nanoindentation: Samantha Lawrence¹; *David Bahr*¹; ¹Purdue University

11:30 AM

Humidity Controlled Static and Dynamic Nanoindentation of the Secondary Wood Cell Walls in Picea Abies: Igor Zlotnikov¹; Luca Bertinetti¹; Ude Hangen2; Michaela Eder1; Peter Fratzl1; 1Max Planck Institute of Colloids and Interfaces; ²Hysitron, Inc.

11:50 AM

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Indentation-Based In-Situ Toughness Characterization Utilizing Nanomechanical Characterization Techniques: Joseph Bonivel¹; Michael Birnkrant1; 1United Technologies Research Center

Nanocomposites III — Multifunctional

Nanocomposites II and Metal Nanocomposites II Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Muralidharan Paramsothy, National University of Singapore, NanoWorld Innovations (NWI); Meisha Shofner, Georgia Institute of Technology; Changsoo Kim, University of Wisconsin-Milwaukee

Europe 2

Wednesday AM	Room: Europe 2
March 18, 2015	Location: Dolphin

Session Chair: Muralidharan Paramsothy, National University of Singapore, NanoWorld Innovations (NWI)

8:30 AM

Synthesis and Characterization of Bio-Composites and Ferroelectric Nanoparticles: Amarilis Declet Vega1; Edgardo Reyes Brondo2; Johnny López²; Ruddy Rivera²; Nakaira Ramírez²; Carolyn Ortiz Rivera²; O. Marcelo Suárez2; 1University of Puerto Rico; 2University of Puerto Rico

8:50 AM Keynote

Tailoring and Measuring Dispersion State in Carbon Nanomaterial **Composites**: *Virginia Davis*¹; ¹Auburn University

9:30 AM Invited

The Role of Percolation Theory in Developing Next Generation Smart Nanomaterials: Daneesh Simien1; 1University of Alabama at Birmingham

10:10 AM Break

10:30 AM

Graphene Reinforced Electroless Ni-P Coatings: Mohammad Islam¹; Iftikhar Ahmad¹; David Burleigh¹; ¹King Saud University

10:50 AM Invited

Excellent Strength-Ductility Combination in Nickel-Graphene Nanoplatelet (GNP/Ni) Nanocomposites: Tushar Borkar¹; Jun Yeon Hwang²; Jaimie Tiley³; Soon Hong⁴; *Rajarshi Banerjee*¹; ¹University of North Texas; ²Korea Institute of Science and Technology; ³Air-Force Research Laboratory; ⁴Korea Advanced Institute of Science and Technology

11:30 AM

Fracture Mechanics of Nickel-Graphene Nanocomposites: Arun Nair1; ¹University of Arkansas

11:50 AM

Effects of Silver Nanowires on the Behavior of Polylactide Nanocomposite Films: Doga Doganay¹; Sahin Coskun¹; Husnu Unalan¹; Cevdet Kaynak¹; ¹Middle East Technical University

Nanostructured Materials for Rechargeable Batteries and for Supercapacitors III — Session V: Advanced **Cathode and Anode Materials for Li-Ion Batteries**

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee Program Organizers: Reza Shahbazian-Yassar, Michigan Technological University; Yan Yao, University of Houston; David Mitlin, Clarkson University

Wednesday AM March 18, 2015

Room: Europe 3 Location: Dolphin

Session Chairs: Yifei Mo, University of Maryland; Reza Shahbazian-Yassar, Michigan Technological University

8:30 AM Invited

2D Materials for Energy Storage: Vivek Shenoy1; 1University of Pennsylvania

8:55 AM Invited

Graphene Electrodes for Next Generation Lithium-Ion Batteries: Nikhil Koratkar¹; ¹Rensselaer Polytechnic Institute

9:20 AM Invited

Investigation of Nano and Nanostructured Silicon as Advanced Anodes for Lithium-Ion Cells: James Wu¹; ¹NASA Glenn Research Center

9:45 AM Invited

High-Energy Conversion Cathodes for Rechargeable Lithium Batteries: *Feng Wang*¹; Sung-Wook Kim¹; Jason Graetz²; ¹Brookhaven National Laboratory; ²HRL Laboratories

10:10 AM Break

10:25 AM Invited

3D Mesostructured Electrodes for High Energy and Power Density Secondary Batteries: *Paul Braun*¹; ¹University of Illinois at Urbana-Champaign

10:50 AM Invited

Silicon Oxycarbides as Anode Materials for Li-Ion Batteries: *Gian Domenico Soraru*¹; Vallachiria S. Pradeep²; Magdalena Graczyk-Zajac²; Ralf Riedel²; ¹University of Trento, Trento, Italy; ²TU Darmstadt, Darmstadt, Germany

11:15 AM Invited

Substituted LiCoPO4 as Cathode for High Energy Li-Ion Batteries: *Taiguang Jow*¹; Jan Allen¹; Joshua Allen¹; Samuel Delp¹; Oleg Borodin¹; Marco Olguin¹; Jeffrey Wolfenstine¹; ¹Army Research Laboratory

Neutron and X-Ray Studies of Advanced Materials VIII: Diffraction Limit and Beyond — Defects, Strains, Stress I

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Brent Fultz, California Institute of Technology; Peter Liaw, University of Tennessee; Jaimie Tiley, Air Force Research Laboratory

Wednesday AM	Room: Pelican 1
March 18, 2015	Location: Swan

Funding support provided by: Air Force Research Laboratory

Session Chairs: Iuliana Cernatescu, Pratt and Whitney; Lyle Levine, National Institute of Standards and Technology

8:30 AM Keynote

Formation and Propagation of Microstructure Defects in Austenitic Steels As Seen by In Situ X-ray Diffraction: *David Rafaja*¹; ¹Freiberg University of Technology

9:10 AM Invited

Understanding Functional Properties of Nanomaterials from Structural Parameters Obtained by Line Profile Analysis: *Michael Zehetbauer*¹; Erhard Schafler¹; Michael Kerber¹; ¹University of Vienna

9:40 AM

Stress/Strain Distribution in Multilayered Steels Consisting of Dissimilar Steels: *Mayumi Ojima*¹; Junya Inoue¹; Ayumi Shiro²; Takahisa Shobu²; Pingguang Xu²; Hiroshi Suzuki²; Stefanus Harjo²; Shoichi Nambu¹; Toshihiko Koseki¹; ¹The University of Tokyo; ²Japan Atomic Energy Agency

10:00 AM Break

10:10 AM Invited

Unified Description of Radial and Rocking-Curve Peak Broadening in Dislocated Crystals: Gyula Zilahi¹; Géza Tichy¹; *Tamás Ungár*¹; ¹Eötvös University Budapest

10:40 AM Invited

Reversible Changes in the Diffraction Peak Asymmetry during Elastic Unloading and Reloading: *Wolfgang Pantleon*¹; Felix Thiel²; Ulrich Lienert³; ¹Technical University of Denmark; ²TU Bergakademie Freiberg; ³DESY Photon Science

11:10 AM

Inhomogeneity Study of Large Format Li-Ion Batteries by Synchrotron X-ray Diffraction: *Xinghua Yu*¹; Daniel Henn²; Ke An¹; Yang Ren³; Zhili Feng¹; Bi Wu⁴; Christian Fau⁴; ¹Oak Ridge National Laboratory; ²University of Tennessee; ³Argonne National Laboratory; ⁴Honda R&D Americas

11:30 AM

Neutron Diffraction Study and EVPSC Modeling of Deformation Mechanisms in Solid-Solution-Strengthened Magnesium Alloys: Soo Yeol Lee¹; Michael Gharghouri²; Huamiao Wang³; Ghazal Nayyeri⁴; Wanchuck Woo⁵; E-Wen Huang⁶; Peidong Wu³; Warren Poole⁴; Wei Wu⁷; Ke An⁷; ¹Chungnam National University; ²Chalk River Laboratories; ³McMaster University; ⁴University of British Columbia; ⁵Korea Atomic Energy Research Institute; ⁶National Chiao Tung University; ⁷Oak Ridge National Laboratory

Neutron and X-Ray Studies of Advanced Materials VIII: Diffraction Limit and Beyond — Diffraction at Nano- and Mesoscale

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Rozaliya Barabash, Oak Ridge National

Laboratory; Gernot Kostorz, ETH Zurich; Brent Fultz, California Institute of Technology; Peter Liaw, University of Tennessee; Jaimie Tiley, Air Force Research Laboratory

Vednesday AM	Room: Macaw 1
/arch 18, 2015	Location: Swan

Funding support provided by: Air Force Research Laboratory

Session Chairs: Peter Liaw, University of Tennessee; E-Wen Huang, National Chiao Tung University

8:30 AM Keynote

Dislocations in Nanocrystalline Domains: *Paolo Scardi*¹; Alberto Leonardi¹; ¹University of Trento

9:10 AM

Determining Individual Phase Flow Properties in a Q&P Steel with In-Situ High Energy X-ray Diffraction and Multi-Phase Elasto-Plastic Self-Consistent Method: *Xiaohua Hu*¹; Kyoo Sil Choi¹; Xin Sun¹; Yang Ren²; Yandong Wang³; ¹Pacific Northwest National Laboratory; ²Argonne National Laboratory; ³University of Science & Technology Beijing

9:30 AM

In-Situ Observation of Deformation and Failure of Multilayered Steel Composite Sheets: Rui Cao¹; *Xinghua Yu*¹; Zhili Feng¹; Wenjun Liu²; Ruqing Xu²; Mayumi Ojima³; Junya Inoue³; T Koseki³, ¹Oak Ridge National Laboratory; ²Argonne National Laboratory; ³University of Tokyo

9:50 AM Break

10:10 AM Keynote

The In Situ Center at CHESS: Matthew Miller¹; ¹Cornell University

10:50 AM Invited

Structural-Resolved Study of Photon-Sensitive Piezoelectric Properties of P(VDF-TrFE)/TiOPc Films via In-Situ Synchrotron X-ray Measurements: *E-Wen Huang*¹; Tzu-Kang Liao²; Wen-Chi Chang³; Wen-Ching Ko⁴; Wei-Tsung Chuang⁵; Yu-Hsiang Hsu³; ¹National Chiao Tung University; ²National Central University; ³National Taiwan University; ⁴Industrial Technology Research Institute; ⁵National Synchrotron Radiation Center

11:20 AM

Hydrogen Cracking in Gas Tungsten Arc Welding of an AISI Type 321 Stainless Steel: *Paul Rozenak*¹; Yakov Unigovski²; Roni Shneck²; ¹Hydrogen Energy Batteries Ltd.; ²Ben Gurion University

Novel Synthesis and Consolidation of Powder Materials — Novel Fabrication of Ceramics

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: Ma Qian, RMIT University (Royal Melbourne Institute of Technology); Iver E Anderson, The Ames Laboratory

Wednesday AM	Room: Swan 10
March 18, 2015	Location: Swan

Session Chairs: Deliang Zhang, Shanghai Jiaotong University; Cuie Wen, RMIT University (Royal Melbourne Institute of Technology)

8:30 AM

Effect of Additives on Microwave and Conventional Sintering of Barium Zinc Tantalate Ceramics: *Swathi Manivannan*¹; Pramod Kumar Sharma²; Dibakar Das¹; ¹University of Hyderabad; ²Institute for Plasma Research

8:50 AM

Effect of Colloidal Processing on Densification Behavior of Barium Zinc Tantalate Ceramics: *Swathi Manivannan*¹; Pramod Kumar Sharma²; Dibakar Das¹; ¹University of Hyderabad; ²Institute for Plasma Research

9:10 AM

Fabrication of Complex-Shaped Ceramic Components through Novel Room-Temperature Injection Molding and 3D Printing of Ceramic Powder Suspension Gels (CeraSGels): Lisa Rueschhoff¹; Rodney Trice¹; Jeffrey Youngblood¹; ¹Purdue University

9:30 AM

Effect of TiO2 Doping on the Densification and Microstructure in High Pressure Sintering Nano Size γ-Al2O3: Nilgun Kuskonmaz¹; Zeynep Taslicukur Ozturk²; ¹Yildiz Technical University; ²Gedik University

9:50 AM Break

10:10 AM Invited

Fabrication of High Performance n-Type Bi2Te3 Thermoelectric Materials by Powder Metallurgy Processes: *Soon-Jik Hong*¹; Hyo-seop Kim¹; Seung-Taek Han¹; Jar-Myung Koo¹; ¹Kongju National University and Institute for Rare Metals

10:35 AM

Structure, Microstructure and Electrical Properties of ZnO Based Varistors Obtained by Spark Plasma Sintering: Yannick Beynet¹; Sophie Guillemet-Fritsch¹; Vincent Bley²; Thomas Pérel²; Frederic Malpièce³; Jonathan Morel³; *Claude Estournès*¹; ¹CIRIMAT; ²LAPLACE; ³Tridelta

10:55 AM

Synthesis of Cement-Like Materials from Wastes by Solid-State Reaction and Solution Combustion Techniques: Oratai Jongprateep¹; Prawin Laomorakot¹; ¹Kasetsart University

11:15 AM

Synthesis of Europium Tetrakis Dibenzoylmethide Triethylammonium: *Ross Fontenot*¹; William Hollerman¹; Kamala Bhat²; Mohan Aggarwal²; ¹University of Louisiana at Lafayette; ²Alabama A&M University

11:35 AM

Processing and Properties of Injection Moulded Alumina and Alumina Composites Using Water Soluble Binder System: *Nutthita Chuankrerkkul*¹; Punnapa Somboonthanasarn²; Rattanaporn Charoenkijmongkol²; Chiraporn Auechalitanukul²; Ryan McCuiston²; ¹Chulalongkorn University; ²King Mongkut's University of Technology Thonburi

Pb-Free Solders and Emerging Interconnect and Packaging — Novel Interconnect and Nano-Materials

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Electronic Packaging and Interconnection Materials Committee Program Organizers: John Elmer, LLNL; Yan Li, Intel Corp.; Andre Lee, Michigan State University; Fan-Yi Ouyang, National Tsing Hua University; Srini Chada, Schlumberger; Kyu-Oh Lee, Intel Corp.; Kwang-Lung Lin, National Cheng Kung University; Christopher Gourlay, Imperial College; Daniel Lewis, Rensselaer Polytechnique Institute; Fan Gao, University of Massachusetts Lowell

Wednesday AM	Room: Lark
March 18, 2015	Location: Swan

Session Chairs: Fu Guo, Beijing University of Technology; Kwang-Lung Lin, National Cheng Kung University

8:30 AM

Development of Pb-Free and Halogen-Free Nanosolder Paste for Electronics Assembly and Packaging: Evan Wernicki¹; Fan Gao¹; Gregory Morose²; Zhiyong Gu¹; ¹University of Massachusetts Lowell; ²Toxics Use Reduction Institute

8:55 AM

Phase Evolution of Sn/In Nanosolder Particles at Elevated Temperatures: Yang Shu¹; Teiichi Ando²; Zhiyong Gu¹; ¹University of Massachusetts Lowell; ²Northeastern University

9:20 AM

Synthesis and Characterization of Sn-Ag-Cu Alloy Nanoparticles: Ali Roshanghias¹; Andriy Yakymovych¹; Herbert Ipser¹; ¹University of Vienna

9:45 AM Break

10:00 AM

Synthesis and Characterization of Sn Coating on MWCNT Using DBA as Capping Agent: *Frischa Wachid*¹; Kwang-Lung Lin¹; ¹Department of Materials Science and Engineering, National Cheng Kung University

10:25 AM

Strength of MWCNT Reinforced 70Sn–30Bi Solder Alloys: *Md Muktadir Billah*¹; Quanfang Chen¹; ¹University of Central Florida

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIV — Session I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee

Program Organizers: Chao-hong Wang, National Chung Cheng University; Jae-Ho Lee, Hongik University; Clemens Schmetterer, Forschungszentrum Juelich, Inst. For Energy and Climate Research -2; Ikuo Ohnuma, Tohoku University; Shien Ping Feng, The University of Hong Kong; Shih-Kang Lin, National Cheng Kung University; Chih-Ming Chen, National Chung Hsing University; Yee-Wen Yen, National Taiwan University of Science and Technology

Wednesday AM	Room: Parrot
March 18, 2015	Location: Swan

Session Chairs: Chao-hong Wang, National Chung Cheng University; Shih-Kang Lin, National Cheng Kung University

8:30 AM Invited

Cu-Ag Core-Shell Nanoparticles as Conductive Ink Material for Printed Electronics Application: Changsoo Lee¹; Na Rae Kim¹; Jahyun Koo¹; Yung Jong Lee¹; *Hyuck Mo Lee*¹; ¹KAIST

9:00 AM

Effect of P Content on the Interfacial Reaction and Mechanical Properties of the Sn/Ni-xP Solder Joints: *Md. Arifur Rahman*¹; T. C. Yeh¹; Cheng-En Ho¹; ¹Yuan Ze University

9:20 AM

Interfacial Reaction of the Ni/Sn-xZn/Cu Sandwich Couples: Wan-Ching Chen1; Mei-Ting Lai1; Yee-Wen Yen1; 1National Taiwan University of Science and Technology

9:40 AM

A Novel Ga-Based Cu-to-Cu Bonding Approach for 3D IC Packaging .: Mei-jun Wang1; Hao-miao Chang1; Shih-kang Lin1; 1National Cheng Kung University

10:00 AM Break

10:20 AM

The Effect of Mass Spalling on Joint Strength of SAC Solder/Co-Based Surface Finishes .: Yi-Ling Tsai¹; Albert Wu¹; ¹National Central University

10:40 AM Invited

Solid-State Reactive Diffusion between Binary Sn-Base Alloys and **Conductor Metals**: *Masanori Kajihara*¹; Misako Nakayama¹; ¹Tokyo Institute of Technology

11:10 AM

Interfacial Reactions between Sn and Electroless Co(P) Metallization: Chao-hong Wang¹; Sheng-en Huang¹; ¹National Chung Cheng University

11:30 AM

Interfacial Reaction in Cu/Pb-Free Solders/Co Couples during Reflowing and Solid-State Aging Process: Chieh-Fu Chen1; Shen-Chang Lee1; Yi-Lun Tsai1; Zong-Han Yang1; Fan-Yi Ouyang1; 1National Tsing Hua University

11:50 AM

Interfacial Reactions in Sn-0.7Cu-xGa/Cu Joints and Phase Equilibria of the Cu-Ga-Sn Ternary System at 200 °C: Yi-kai Kuo1; Trong Lan Nguyen1; Shih-kang Lin1; 1National Cheng Kung University

12:10 PM

Effect of Different Intermetallic Compounds and Bump Heights on Thermal Cycling Tests of Microbumps: Yi Cheng Chu1; Chih Chen1; Chau-Jie Zhan2; Yu-wei Huang2; 1Department of Materials Science & Engineering, National Chiao Tung University; ²Assembly and Reliability Department/EOL/ ITRI

Phase Transformations and Microstructural Evolution — Steels and Ferrous Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Soumya Nag, University of North Texas; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama ; Amy Clarke, Los Alamos National Laboratory; Frederic Danoix, CNRS - Université de Rouen; Emmanuelle Marquis, University of Michigan

Wednesday AM	Room: Swan 3
March 18, 2015	Location: Swan

Session Chairs: Paul Gibbs, Los Alamos National Laboratory; Adam Creuziger, National Institute of Standards and Technology

8:30 AM Invited

Uncertainty in Retained Austenite Measurements and Orientation **Distribution Functions**: Adam Creuziger¹; Thomas Gnaeupel-Herold¹; ¹National Institute of Standards and Technology

9:00 AM

V

Phase Transformation Kinetics and Its Relations with the Texture and Microstructure Evolutions in a TRIP Steel under Biaxial Loading Conditions: Synchrotron X-Ray and Electron Back-Scatter Diffraction Studies: Ercan Cakmak¹; Hahn Choo²; Jun-Yun Kang³; Yang Ren⁴; ¹Oak Ridge National Laboratory; ²University of Tennessee; ³Korea Institute of Materials Science; ⁴Argonne National Laboratory

9:20 AM

Effect of Heat Treatment on Microstructures and Tensile Properties of a Fe-1.7Mn-1.3Al-0.5C Steel: L.N. Qiu¹; Yongfeng Shen¹; X.M. Zhao¹; Y.D. Liu1; L. Zuo1; 1Northeastern University

9:40 AM

The Effect of Nitrogen on the Strain-Induced Martensite Transformation in Stainless Steel Based Hardfacing Alloys: Ryan Smith1; Peter Anderson1; Sudarsanam Babu2; Guilherme Faria3; Antonio Ramirez3; John Siefert4; David Gandy⁴; ¹The Ohio State University; ²University of Tennessee, Knoxville; ³Brazilian Nanotechnology National Laboratory; ⁴Electric Power Research Institute

10:00 AM Break

10:20 AM

Twin Migration in Fe-Based BCC Crystals-Theory and Experiments: Avinesh Ojha¹; Huseyin Sehitoglu¹; Luca Patriarca¹; Hans Maier²; ¹University of Illinois-Urbana Champaign; ²Leibniz University

10:40 AM

Interpretation of Cryogenic-Temperature Dynamic Mechanical Properties by Microstructural Evolution of Dynamically Deformed Specimens in Three Fe-(0.4~1.0)C-18Mn Austenitic Steels: Jaeyeong Park1; Hyunmin Kim¹; Yumi Ha²; Joong Eun Jung¹; Hyoung Seop Kim¹; Byeong-Joo Lee¹; Nack J. Kim²; Sunghak Lee¹; ¹Center for Advanced Aerospace Materials, POSTECH; ²Graduate Institute for Ferrous Technology, POSTECH

11:00 AM

Investigation of Crystallographic Defects in CN3MN Grade Cast Superaustenitic Steels: Mertcan Baskan¹; Scott Chumbley²; Eren Kalay¹; ¹METU; ²Iowa State University

11:20 AM

Effect of Carbon and Nitrogen on Microstructures and Creep Properties of Austenitic Heat-Resistant Cast Steels for Exhaust Component Applications: Yinhui Zhang¹; Mei Li²; Larry Godlewski²; Jacob Zindel²; Qiang Feng1; 1University of Science and Technology Beijing; 2Ford Motor Company

11:40 AM

Microstructure Characterization of Grade 91 Steel Weldments with Applied Thermo-Mechanical Treatment: Benjamin Shassere¹; Yukinori Yamamoto2; Xinghua Yu2; Sudarsanam Babu1; 1University of Tennessee; 2Oak Ridge National Laboratory

12:00 PM

Design of High-Performance Alloys from First-Principles Theory: Hualei Zhang¹; Levente Vitos²; ¹Xi'an Jiaotong University; ²Royal Institute of Technology

Polycrystalline Materials: Bringing Together Experiments, Simulations, and Analytic Theories – Session V

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Dana Zöllner, Otto von Guericke University Magdeburg; Douglas Medlin, Sandia National Laboratories; Dmitri Molodov, RWTH Aachen

Wednesday AM March 18, 2015

Room: Oceanic 8 Location: Dolphin

Session Chairs: Dmitri Molodov, RWTH Aachen; Martin Glicksman, Florida Institute of Technology

8:30 AM Invited

Topological Representation of Polyhedral Grains: Martin Glicksman¹; Paulo Rios2; ¹Florida Institute of Technology; ²Universidade Federal Fluminense

8:55 AM Invited

Topological Representation of Polyhedral Grains: Growth Kinetics: *Paulo Rios*¹; Martin Glicksman²; ¹UFF-EEIMVR; ²Florida Institute of Technology

9:20 AM

Stereology of Mean Curvature Driven Grain Growth: *Robert DeHoff*¹; Burton Patterson¹; Steven Chiu¹; Catherine Sahi¹; ¹University of Florida

9:40 AM

An In-Situ TEM Study of the Thermal Response of Ultrafine-Grained Magnesium: Dinakar Sagapuram¹; *Mert Efe*²; Cem Akatay¹; ¹Purdue University; ²Middle East Technical University

10:00 AM

Atomistic Simulations of Microstructural Evolution: Diana Farkas¹; ¹Virginia Tech

10:20 AM Break

10:40 AM Invited

Design of Interfacial Networks in Polycrystalline Materials: Oliver Johnson¹; *Christopher Schuh*¹; ¹Massachusetts Institute of Technology

11:10 AM

Tailoring the Twin Spacing in the Formation of Highly Nanotwinned Cu Alloys: Leonardo Velasco¹; Andrea Hodge¹; ¹University of Southern California

11:30 AM

Influence of Grain Boundary Character on the Rotation of Grains under a Capillary Driving Force: *Luis Barrales-Mora*¹; Dmitri Molodov²; ¹Institut für Metallkunde und Metallphysik; ²Institut fuer Metallkunde und Metallphysik

11:50 AM

Influence of Pressure on the Shear Strength of Symmetric Tilt Interfaces in Cu: Shreevant Tiwari¹; *David McDowell*¹; ¹Georgia Institute of Technology

2015 Functional Nanomaterials: Energy and Sensing — Nanomaterial Fabrication II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee

Program Organizers: Jung-Kun Lee, University of Pittsburgh; Behrang Hamadani, National Institute of Standards and Technology; Sung Hun Wee, HGST, A Western Digital Company; Nitin Chopra, University of Alabama, Tuscaloosa; Terry Xu, The University of North Carolina at Charlotte; Jang-Sik Lee, Pohang University of Science and Technology (POSTECH)

Wednesday PM	Room: Swan 4
March 18, 2015	Location: Swan

Session Chair: Sung-Hun Wee, HGST, A Western Digital Company

2:00 PM

Nanocrystalline Sm-Fe Based Alloys: Structural and Magnetic Properties: Lotfi Bessais¹; Karim Zehani¹; Jacques Moscovici¹; Najeh Mliki¹; ¹CNRS

2:20 PM

Silicon Nanowire/Graphene Hybrids as Sensors: Yuan Li¹; John Dykes¹; *Nitin Chopra*¹; ¹The University of Alabama

2:40 PM

Transversely Modulated Palladium-Hydride Nanostructure Formation in Epitaxial Film: Brad Boyerinas¹; ¹National Institute of Standards and Technology

3:00 PM

Effects of Porous Carbon/CNTs on the Discharge Performance of Li-Air Batteries: Yuxing Yan¹; ¹Kunming University of Science and Technology

3:20 PM

Current-Driven Domain Wall Behaviors in Magnetic Nanowires: Liwei Geng¹; Yongmei Jin¹; ¹Michigan Technological University

3:40 PM Break

3:55 PM

Low Temperature Synthesis of Graphite on Ni Films Using Inductively Coupled Plasma Enhanced CVD: *Lanxia Cheng*¹; Kayoung Yun²; Antonio Lucero¹; Archana Venugopal³; Luigi Colombo³; Jiyoung Kim¹; ¹UTD; ²Kookmin University; ³Texas Instruments

4:15 PM

Nanomaterials Synthesis by Novel Rayleigh Taylor Instabilities: *Sagar Yadavali*¹; Daniel San Roman¹; Mikhail Khenner²; Ramakrishnan Kalyanaraman¹; ¹University of Tennessee; ²Western Kentucky University

4:35 PM

Completely Green Synthesis of Silver Nanoparticles Decorated MWCNT and Its Antibacterial and Catalytic Properties: Sneha Mohan¹; *Oluwafemi Oluwatobi*¹; Sandile Songca²; Nandakumar Kalarikkal³; Sabu Thomas³; ¹Capepeninsula University of Technology; ²Walter Sisulu University; ³Mahatma Gandhi University

4:55 PM

Structural and Magnetic Properties of Fe_55 Co_45 Nanoparticles Synthesized by Different Methods: Riadh Bez¹; *Najeh Mliki*¹; Karim Zehani²; Lotfi Bessais²; ¹LMOP, Faculté des Sciences de Tunis, Université de Tunis El Manar; ²ICMPE, UMR7182 CNRS-UPEC

5:15 PM

Synthesis of High Active NiCu Alloy Fibers as Anode Catalysts for the Electro-Oxidation of Ethanol: *Jing Zhan*¹; Meng Cai¹; Chuanfu Zhang¹; Chen Wang¹; Jiann-Yang Hwang²; ¹Central South University; ²Michigan Technological University

6th International Symposium on High Temperature Metallurgical Processing — Characterization of High Temperature Metallurgical Process

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Gerardo Alvear, Xstratatech; Onuralp Yucel, Istanbul Technical University; Xinping Mao, Wuhan Iron and Steel Corporation; Hong Yong Sohn, University of Utah; Naiyang Ma, ArcelorMittal; Phillip Mackey, P.J. Mackey Technology; Tom Battle, Midrex Technologies

Wednesday PM	Room: Peacock
March 18, 2015	Location: Swan

Session Chairs: Jiann-Yang Hwang, Michigan Technological University; Yuanbo Zhang, Central South University

2:00 PM

CFD Simulations of Molten Steel Flow Patterns, Distribution of Inclusions, and Forces Imposed by the Melt Flow on Clogged Surfaces Inside a Submerged Entry Nozzle: Mahdi Mohammadighaleni¹; *Mohsen Asle Zaeem*¹; Jeffrey Smith¹; ¹Missouri University of Science and Technology

2:20 PM

Characterisation of Coal Burnouts In The Raceway of Ironmaking Blast Furnace: Yansong Shen¹; Aibing Yu¹; ¹Monash University

2:40 PM

Analysis of BF Hearth Reasonable Cooling System Based on the Water Dynamic Characteristics: Zuo Haibin¹; Jiao Kexin¹; Zhang Jianliang¹; Li Qian¹; Wang Cui¹; ¹USTB

3:00 PM

Techno-Economic Assessment of Recycling BOF Steelmaking Offgas Cleaning System Solid Wastes by Using Zinc-Free Scrap: Naiyang Ma¹; ¹ArcelorMittal

3:20 PM Break

3:40 PM

Numerical Analysis of Influencing Factors on Temperature Distribution of Blast Furnace Stave: *Haibin Zuo*¹; Jun Hong¹; Cong Wang¹; Jianliang Zhang²; ¹State Key Laboratory of Advanced Metallurgy,University of Science and Technology Beijing; ²School of Metallurgical and Ecological Engineering,University of Science and Technology Beijing

4:00 PM

Distribution Behavior of Vanadium, Chromium and Phosphorus between Basic Slag and Semi-Steel: Xuan Liu¹; *Jiang Diao*¹; Tao Zhang¹; Bing Xie¹; ¹Chongqing University

4:20 PM

Distribution Behaviours of Cu, Co and Fe during Cu Smelter Slag Cleaning Process: Chao-bo Tang¹; Yun Li¹; Yong-ming Chen¹; Sheng-hai Yang¹; Jing He¹; Long-gang Ye¹; Hao-tian Xue²; ¹Central South University; ²Qinghai Provincial Research and Design Academy of Environmental Scienes

4:40 PM

Discussion of the Investigation Method on the Reaction Kinetics of Metallurgical Reaction Engineering: *Ruiling Du*¹; Keng Wu¹; Jiazhi Zhang¹; Yong Zhao¹; ¹University of Science and Technology Beijing

5:00 PM

Simulation Computation of 430 Ferritic Solidification: *Ruipeng Pang*¹; Changrong Li¹; Fuming Wang¹; ¹University of Science & Technology Beijing

5:20 PM

Simulation Study on Solution Foaming by Controlling Gas Generation Reaction in Water-Glycerol System: *Xu Zhang*¹; Guibao Qiu¹; Xuewei Lv¹; ¹Chongqing University

6th International Symposium on High Temperature Metallurgical Processing — Direct Reduction and Smelting Reduction

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Gerardo Alvear, Xstratatech; Onuralp Yucel, Istanbul Technical University; Xinping Mao, Wuhan Iron and Steel Corporation; Hong Yong Sohn, University of Utah; Naiyang Ma, ArcelorMittal; Phillip Mackey, P.J. Mackey Technology; Tom Battle, Midrex Technologies

Wednesday PM	Room: Swan 5
March 18, 2015	Location: Swan

Session Chairs: Phillip Mackey, P.J. Mackey Technology; Zhiwei Peng, Michigan Technological University

2:00 PM

On the Simultaneos Iron Oxide Reduction and Carburization Kinetics: *Jose Carlos D'Abreu*¹; Mauricio Otaviano²; Helio Kohler³; Edelink Efrain Falero¹; ¹PUC-Rio; ²Samarco Mining Co.; ³Techn-os

2:20 PM

Slag Chemistry of Bottom Blown Copper Smelting Furnace at Dongying Fangyuan: *Mao Chen*¹; Zhixiang Cui²; Baojun Zhao¹; ¹University of Queensland; ²Dongying Fangyuan Nonferrous Metals Co., Ltd

2:40 PM

Reduction Behavior of Multi-Nonferrous Metals-bearing Iron Concentrate Pellet by Mixed CO/H2 Gas: *Guanghui Li*¹; Peidan Wen¹; Zhixiong You¹; Yuanbo Zhang¹; Tao Jiang¹; ¹School of Minerals Processing and Bioengineering, Central South University

3:00 PM

Viscosity Property of Gold-Antimony Smelting Slags by Blast Furnace: Yongbin Yang¹; Qiang Zhong²; Tao Jiang¹; Qian Li¹; Bin Xu¹; ¹Central South University; ²Central South University

3:20 PM

Experimental Investigation on Reduction Kinetics of Stainless Steel-Making Slag in Iron Bath Smelting Reduction: *Bo Zhang*¹; Jienan Liu²; Yanfeng Yang²; Luming Liu²; Jiechao Liu²; Lijian Luo²; Yubao Ma²; Hong Xin¹; ¹Shanghai University; ²Guiyang Vocational and Technical College

3:40 PM Break

4:00 PM

Effect of MgO and Basicity on the Viscosity and Structure of the CaO-SiO₂-16wt%Al₂O₃-MgO Blast Furnace Slag: *Wang Zhe*¹; Jianliang Zhang¹; Fanyi Meng¹; Tao Yu¹; ¹University of Science and Technology of Beijing

4:20 PM Invited

Kinetics of Vanadium Extraction from Hot Metal by Basic Slag: Tao Zhang¹; Bing Xie¹; Xuan Liu¹; *Jiang Diao*¹; Zhen Zhang¹; Hong-Yi Li¹; ¹Chongqing university

4:40 PM

Phase Transformation in Magnesium-rich Nickel Oxide Ore After Reduction Roasting Process: Qian Li¹; *Yonggang Wei*¹; Bo Li¹; Shiwei Zhou¹; Hua Wang¹; Baozhong Ma²; Chengyan Wang²; ¹State Key Laboratory of Complex Nonferrous Metal Resources Clean Utilization, Kunming University of Science and Technology; ²Beijing General Research Institute of Mining and Metallurgy

5:00 PM

Recovery of Cr during Smelting Treatment of Stainless Steel Dust: *Yanling Zhang*¹; Wenming Guo¹; Xinlei Jia¹; ¹University of Science and Technology Beijing

5:20 PM

Effect of Additives on the Reduction and Melting Separation of Ludwigite/ Coal Composite Pellet: *Guang Wang*¹; Jingsong Wang¹; Xuefeng She¹; Qingguo Xue¹; ¹University of Science and Technology Beijing

Acta Materialia Symposium — Honoring 2015 Award Recipients Tresa Pollock and David Embury

Program Organizer: Carolyn Hansson, University of Waterloo

Wednesday PM March 18, 2015 Room: Asia 5 Location: Dolphin

Session Chair: Carolyn Hansson, University of Waterloo

3:00 PM Introductory comments by Carolyn M. Hannson, University of Waterloo; and George T. "Rusty" Gray, III, Los Alamos National Laboratory

3:10 PM Invited

Design of New Co-base Alloy Single Crystals: The Impact of an MGI Approach: *Tresa Pollock*¹; Michael Titus; Robert Rhein; A. Mottura¹; A. Suzuki¹; A. Van der Ven¹; ¹University of California Santa Barbara

3:40 PM Question and Answer Period

3:50 PM Invited

Exploring Controlled Heterogeneity as a Strengthening Mechanism: *David Embury*¹; ¹McMaster University

4:20 PM Question and Answer Period

4:30 PM Reception

Additive Manufacturing: Interrelationships of Fabrication, Constitutive Relationships Targeting Performance, and Feedback to Process Control — Additive Manufacturing of Ti - 6AI - 4V

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; David Bourell, University of Texas at Austin; Reginald Hamilton, Pennsylvania State University; James Sears, GE Global Research Center; Allison Beese, Pennsylvania State University; Rajiv Mishra, University of North Texas

Wednesday PM	Room: Northern Hemisphere A2
March 18, 2015	Location: Dolphin

Session Chairs: Allison Beese, Pennsylvania State University; Ola Harrysson, North Carolina State University

2:00 PM Invited

Comparison of Mechanical Properties of Titanium (Ti6Al4V) Produced via Powder Bed Direct Metal Additive Manufacturing: *Ola Harrysson*¹; Timothy Horn¹; Ronald Aman¹; Harvey West¹; ¹North Carolina State University

2:30 PM

Automated Multi-Scale Microstructure Heterogeneity Analysis of Selective Electron Beam Melted TiAl6V4 Components: *Hao Zhao*¹; Phil Prangnell¹; ¹The University of Manchester

2:50 PM

Correlation of Microstructure and Mechanical Properties of Ti-6Al-4V Components Fabricated Through Laser-Based Directed Energy Deposition: Beth Carroll¹; Todd Palmer¹; *Allison Beese*¹; ¹Pennsylvania State University

3:10 PM

Martensite Decomposition in Ti-6Al-4V Additively Manufactured by Selective Laser Melting (SLM): *Wei Xu*¹; Shoujin Sun¹; Suming Zhu¹; Joe Elambasseril¹; Qianchu Liu²; Mark Easton¹; Ma Qian¹; Milan Brandt¹; ¹RMIT University; ²Defence Science and Technology Organisation

3:30 PM Break

3:50 PM

WEDNESDAY PM

Microstructure Evaluation of Ti-6Al-4V Fabricated by Additive Manufacturing Process: *Allen Bagheri*¹; Denver Seely¹; Nima Shamsaei¹; Scott Thompson¹; ¹Mississippi State University

4:10 PM

Integration of Deformation Processing with Additive Manufacture of Ti-6Al-4V Components for Improved β Grain Structure and Texture: *Jack Donoghue*¹; Jagjit Sidhu²; Andrew Wescott²; Phil Prangnell¹; ¹University of Manchester; ²BAE Systems

4:30 PM

Microstructure Evolution, Properties, and Damage Mechanisms in Structural Materials Manufactured by Laser Engineered Net Shaping: *Yawei Zhai*¹; Hayley Sandgren¹; Diana Lados¹; ¹Worcester Polytechnic Institute, Integrative Materials Design Center

Additive Manufacturing: Interrelationships of Fabrication, Constitutive Relationships Targeting Performance, and Feedback to Process Control — Electron Beam Techniques for Additive Manufacturing

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; David Bourell, University of Texas at Austin; Reginald Hamilton, Pennsylvania State University; James Sears, GE Global Research Center; Allison Beese, Pennsylvania State University; Rajiv Mishra, University of North Texas

Wednesday PM March 18, 2015 Room: Northern Hemisphere A1 Location: Dolphin

Session Chairs: John Carpenter, Los Alamos National Laboratory; Leila Ladani, University of Connecticut

2:00 PM Invited

Local and Global Mechanical Behavior and Microstructure of Ti6Al4V Parts Built Using Electron Beam Melting Technology: Leila Ladani¹; ¹University of Connecticut

2:30 PM

Hot Isostatic Pressing as a Means to Enhance the High Cycle Fatigue Resistance of Inconel 718 Produced Through Electron Beam Melting: *Michael Kirka*¹; William Sames²; Frank Medina³; Ryan Dehoff¹; ¹Oak Ridge National Laboratory; ²Texas A & M University; ³Arcam AB

2:50 PM

Fracture and Fatigue Crack Growth Behavior of Ti-6Al-4V Made by Electron Beam Melting: *Mohsen Seifi*¹; Matt Dahar¹; Ron Aman²; Ola Harrysson²; Jack Beuth³; John Lewandowski¹; ¹Case Western Reserve University; ²North Carolina State University; ³Carnegie Mellon University

3:10 PM

Fabrication of Turbine Disk Materials by Additive Manufacturing: Chantal Sudbrack¹; Quincy Bean²; Kenneth Cooper²; Robert Carter¹; S. Lee Semiatin³; Timothy Gabb¹; ¹NASA Glenn Research Center; ²NASA Marshall Space Flight Center; ³Air Force Research Laboratory

3:30 PM Break

3:50 PM

Investigation of Residual Stress Distributions and Anisotropic Build Properties in Electron Beam Additively Manufactured Inconel 718 Thetashaped Specimens: Ercan Cakmak¹; Thomas Watkins¹; Lindsay Kolbus¹; Ryan Dehoff¹; Chad Duty¹; Sudarsanam Babu²; ¹Oak Ridge National Laboratory; ²Oak Ridge National Laboratory and University of Tennessee

4:10 PM

Characterization of Functional Gradient Mixing in Additive Manufactured Material: *Craig Brice*¹; Allison Popernack²; Ravi Shenoy³; James Baughman⁴; ¹NASA Langley Research Center; ²Virginia Polytechnic Institute and State University; ³Northrop Grumman Corporation; ⁴Analytical Mechanics Associates

4:30 PM

The Effect of Post-Processing on the Microstructure and Mechanical Properties of Inconel 718 Produced by Electron Beam Melting: *William Sames*¹; Michael Kirka²; Kinga Unocic²; Frank Medina³; Ryan Dehoff²; ¹Texas A&M University; ²Oak Ridge National Laboratory; ³Arcam AB

4:50 PM

3D Printing of Titanium Alloys at NIN by Selective Electron Beam Melting (SEBM): *H. P. Tang*¹; J. Wang¹; ¹Northwest Institute for Nonferrous Metal Research

5:10 PM

Phase Transformation in Electron Beam Melting of Commercially Pure Titanium and Ti-6Al-4V Alloy: *Kenta Yamanaka*¹; Manami Mori²; Tsuyoshi Saito¹; Wataru Saito¹; Akihiko Chiba¹; ¹Tohoku University; ²Sendai National College of Technology

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Dislocation Structures

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee *Program Organizers:* Rodney McCabe, Los Alamos National Laboratory; John Carpenter, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Khalid Hattar, Sandia National Laboratory; Irene Beyerlein, Los Alamos National Laboratory; Wolfgang Pantleon, Technical University of Denmark

Wednesday PM	Room: Pelican 2
March 18, 2015	Location: Swan

Session Chairs: Klaus-Dieter Liss, Australian Nuclear Science and Technology Organisation; David McDowell, Georgia Institute of Technology

2:00 PM Invited

Multiscale and Nondestructive 3D Mapping of Grains and Sub Grains and Their Evolution during Deformation Using X-ray Microscopy: *Henning Poulsen*¹; Hugh Simons¹; Søren Schmidt¹; Wolfgang Pantleon¹; Carsten Detlefs²; Wolfgang Ludwig²; ¹DTU; ²ESRF

2:30 PM Invited

CharacterizingStress-DrivenMicrostructuralEvolutioninNanocrystallineAlloys:Mo-rigenHe¹;GyuseokKim¹;DanielGianola¹;¹University of Pennsylvania

3:00 PM

Quantitative Analysis of the Orientation Spreading in Individual Grains during Plastic Deformation: *Wolfgang Pantleon*¹; ¹Technical University of Denmark

3:20 PM Break

3:40 PM

Mapping Dislocation Densities Using Precession Electron Diffraction: *Asher Leff*¹; Christopher Weinberger¹; Mitra Taheri¹; ¹Drexel University

4:00 PM

Application of Precession Electron Diffraction in Deformation Studies of Advanced Non-Ferrous Structural Alloys: *Iman Ghamarian*¹; Yue Liu¹; Peyman Samimi¹; Yang Cao¹; Peter Collins¹; ¹University of North Texas

4:20 PM

Stacking Faults, Dislocation Configuration, and Mechanical Behavior in Mg-Y Alloys: *Dalong Zhang*¹; Subhash Mahajan¹; Enrique Lavernia¹; ¹University of California-Davis

4:40 PM

Plastic Deformation in a Wrought Magnesium Alloy Under a Biaxial-Loading Condition Investigated by in-situ Synchrotron X-ray Diffraction Mapping: *Wei Wu*¹; Chih-Pin Chuang²; Yang Ren²; Ke An¹; ¹Oak Ridge National Laboratory; ²Argonne National Laboratory

5:00 PM

Deformation Induced Stacking Fault Tetrahedra in Gold Nanocrystals: *Scott Mao*¹; Jiangwei Wang¹; Sankar Narayanan²; Ting Zhu²; ¹University of Pittsburgh; ²Georgia Institute of Technology

Advanced Energy-Efficient Light Metal (AI, Mg, and Ti) Extraction Technologies and Processes – Session II

Sponsored by: TMS: Energy Committee

Program Organizers: James Klausner, US Department of Energy; Adam Powell, INFINIUM, Inc.; Peter McGrail, PNNL; Aldo Steinfeld, ETH Zurich

Wednesday PM March 18, 2015 Room: Southern Hemisphere V Location: Dolphin

Session Chair: To Be Announced

2:00 PM

New Approaches for the Production of Titanium Metal: *Prabhat Tripathy*¹; Derek Fray²; Guy Fredrickson¹; ¹Idaho National Laboratory; ²University of Cambridge

2:20 PM

Novel Titanium Electrowinning Process Using Specialized Segmented Diaphragms: Chang-Jung Hsueh¹; Mirko Antloga¹; Craig Virnelson¹; Uziel Landau¹; Mark DeGuire¹; *Rohan Akolkar*¹; ¹Case Western Reserve University

2:40 PM

Review of Oxycarbide Approach to Electrolytic Titanium Production: *P. Chris Pistorius*¹; Farzin Fatollahi-Fard¹; ¹Carnegie Mellon University

3:00 PM

Research on the Optimization of Ti Metal Extraction from Ti-Slag by an Energy-Efficient Chemical Pathway: *Ying Zhang*¹; Zhigang Fang¹; Jun Guo¹; Zhe Huang¹; Hyrum Lefler¹; ¹University of Utah

3:20 PM Break

3:50 PM

Investigation of Leaching Methods for Impurity Removal from Reduced Upgraded Slag: Nathan Hamilton¹; Amarchand Sathyapalan¹; *Michael Free*¹; Zak Fang¹; ¹University of Utah

4:10 PM

Study of Separating Ti₂CO from Simulated Carbon-Thermal Reduced Titanium Ores by Flotation Process: *Zhuodi Chen*¹; Kai Huang¹; Bo Jiang¹; Qiuyu Wang¹; Hongmin Zhu¹; ¹State Key Laboratory of Advanced Metallurgy and School of Metallurgical & Ecological Engineering, University of Science and Technology Beijing

4:30 PM

Preparation of Ti-Al-V Alloys by Aluminothermic Reaction: *Zhijiang Gao*¹; Huimin Lu¹; Liyuan Zhao¹; ¹Beihang University

4:50 PM

Study on Smelting Reduction of Coal-Containing Pellets of Vanadic-Titanomagnetite Sand by Combined Rotary Hearth Furnace and Grinding Magnetic Separation: *Zhijiang Gao*¹; Huimin Lu¹; Liang Fan¹; ¹Beihang University

5:10 PM Concluding Comments

Advances in Solidification of Metallic Alloys under External Fields — In-situ Studies of Solidification under External Fields

Sponsored by: TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS: Aluminum Committee, TMS: Solidification Committee *Program Organizers:* Jiawei Mi, University of Hull; Dmitry Eskin,

Brunel University

Wednesday PM March 18, 2015 Room: Swan 1 Location: Swan

Session Chairs: Dmitry Eskin, Brunel University; Jiawei Mi, University of Hull

2:00 PM Invited

Studying the Dynamic Effects of a Pulsed Electromagnetic Field on Solidification Using Synchrotron Based X-ray Radiography and Automated Data Extraction: *Patrick Grant*¹; Enzo Liotti¹; ¹Oxford University

2:30 PM Invited

Effects of Thermo-Electric-Magnetic Convection on Solidification: Yves Fautrelle¹; ¹Grenoble Institute of Technology

3:00 PM

In-situ Synchrotron X-ray Studies of Ultrasound Shock Wave and Enhanced Flow during Metal Solidification Processes: Dongyue Tan¹; Tung Lik Lee¹; *Jiawei Mi*¹; ¹University of Hull

3:20 PM

Ultrasonic Melt Processing of Metal Matrix Composites: A 4D Experimental Study of Solidification and Remelting: *Sofiane Terzi*¹; Rémi Daudin²; Luc Salvo²; Pierre Lhuissier²; Elodie Boller³; Wim Sillekens¹; David Jarvis¹; ¹European Space Agency; ²Grenoble University; ³ESRF

3:40 PM Break

3:55 PM

In Situ Synchrotron Radiography of Ultrasound Cavitation in a Molten Al-10Cu Alloy: *Wenwu Xu*¹; Iakovos Tzanakis²; Prakash Srirangam³; Sofiane Terzi⁴; Wajira Mirihanage⁵; Dmitry Eskin²; Ragnvald Mathiesen⁵; Andrew Horsfield⁶; Peter Lee¹; ¹The University of Manchester; ²Brunel University; ³University of Warwick; ⁴European Space Agency; ⁵Norwegian University of Science and Technology; ⁶Imperial College London

4:15 PM

Study of Cavitation Induced Nucleation in Metallic Alloy Melt via Small Angle X-ray Scattering: *Da Shu*¹; Haijun Huang¹; Jun Wang¹; Baode Sun¹; Jiawei Mi²; ¹Shanghai Jiao Tong University; ²The University of Hull

4:35 PM

Melting and Solidification Processes Under Surface Laser Irradiation as a Driving Force for Discrete-Gradient Design in Fe-Alloys Volume: Sergey Sidorenko¹; Yevgen Ivashenko¹; Nataliia Franchik¹; ¹National Technical University of Ukraine "KPI"

4:55 PM

Solidification Behavior of Mg-HA Nanocomposites Subjected to High Shear Treatment: Junyi Li¹; Yan Huang¹; ¹Brunel University

5:15 PM

The Directional Solidification of Two Kinds of Al-Si Alloys Under the Pulsed Magnetic Field: *Zhilong Zhao*¹; Jian Su¹; Haiguo Ren¹; Lin Liu¹; ¹Northwestern Polytechnic University

Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu — Cast Iron II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Laurentiu Nastac, The University of Alabama; Baicheng Liu, Tsinghua University; Hasse Fredriksson, KTH - Royal Institute of Technology; Jacques Lacaze, Université de Toulouse; Chun-Pyo Hong, Yonsei University; Adrian Catalina, Caterpillar Inc.; Andreas Buhrig-Polaczek, RWTH Aachen University; Daan Maijer, The University of British Columbia; Charles Monroe, University of Alabama at Birmingham; Adrian Sabau, Oak Ridge National Laboratory; Roxana Ruxanda, Emerson Climate Technologies; Alan Luo, The Ohio State University; Subhayu Sen, GEOCENT; Attila Diószegi, Jönköping University, School of Engineering

Wednesday PM	Room: Swan 7
March 18, 2015	Location: Swan

Session Chair: Adrian Catalina, Caterpillar

2:00 PM

Experimental Studies of Gray Cast Iron Solidification with Linear Variable Differential Transformer: *Abel Tadesse*¹; Hasse Fredriksson¹; ¹Royal Institute of Technology

2:20 PM

Undercooling, Cooling Curves and Nodule Count for Hypo-, Hyper- and Eutectic Thin-Walled Ductile Iron Castings: Wojciech Kapturkiewicz¹; Andriy Burbelko¹; ¹AGH University of Science and Technology

2:40 PM

Graphite Growth Morphologies in High Al Cast Iron: *Haji Muhammad Muhmond*¹; Hasse Fredriksson¹; ¹Royal Institute of Technololgy (KTH)

3:00 PM

Observations of Microstructure and Properties in Cast Iron from Historical Experiments and Thermodynamic Modeling: *Siddhartha Biswas*¹; Charles Monroe¹; ¹University of Alabama at Birmingham

3:20 PM

Thermophysical Properties of Thin Walled Compacted Graphite Iron Castings: *Marcin Górny*¹; Janusz Lelito¹; Magdalena Kawalec¹; ¹AGH University of Science and Technology

3:40 PM Break

4:00 PM Invited

Understanding Cast Iron Materials and Components – A Never Ending Story: *Ingvar Svensson*¹; Jakob Olofsson¹; ¹Jonkoping University

4:25 PM Invited

A Eutectic Growth Model for Binary Alloys Accounting for Phase Fractions Adjustment during Solidification: *Adrian Catalina*¹; Peter Voorhees²; Richard Huff³; Amber Genau⁴; ¹Caterpillar Inc; ²Northwestern University; ³Caterpillar; ⁴University of Alabama at Birmingham

4:50 PM

Understanding Superfine Graphite Iron Solidification through Interrupted Solidification Experiments: Gorka Alonso¹; Doru Stefanescu²; Esther De la Fuente¹; Edurne Aguado¹; Ramon Suarez³; *P Larranaga*⁴; ¹AZTERLAN; ²The Ohio State University, Columbus, OH and The University of Alabama, Tuscaloosa, AL; ³Veigalan Estudio 2010 S.L; ⁴I+D y Procesos Metalurgicos

5:10 PM

The Effect of Oxygen and Sulfur on Superfine Interdendritic Graphite Growth: Edurne Aguado¹; Gorka Alonso¹; Doru Stefanescu²; Jon Sertucha¹; Pello Larrañaga¹; *Ramón Suárez*³; ¹IK4-AZTERLAN; ²The Ohio State University and The University of Alabama; ³Veigalán Estudio 2010

Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu — Microstructure Evolution II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Laurentiu Nastac, The University of Alabama; Baicheng Liu, Tsinghua University; Hasse Fredriksson, KTH - Royal Institute of Technology; Jacques Lacaze, Université de Toulouse; Chun-Pyo Hong, Yonsei University; Adrian Catalina, Caterpillar Inc.; Andreas Buhrig-Polaczek, RWTH Aachen University; Daan Maijer, The University of British Columbia; Charles Monroe, University of Alabama at Birmingham; Adrian Sabau, Oak Ridge National Laboratory; Roxana Ruxanda, Emerson Climate Technologies; Alan Luo, The Ohio State University; Subhayu Sen, GEOCENT; Attila Diószegi, Jönköping University, School of Engineering

Wednesday PM	Room: Swan 6
March 18, 2015	Location: Swan

Session Chair: Adrian Sabau, Oak Ridge National Laboratory

2:00 PM Invited

In Situ Study on the Evolution of Dendrite Morphology Affected by Electric Field in Sn-Bi Alloy: *Tongmin Wang*¹; ¹Dalian University of Technology

2:25 PM Invited

Heterogeneous Strip Originated from Inclusions: Characterization and Physical Mechanism: *Xiaoping Ma*¹; Dianzhong Li¹; ¹Institute of Metals Research, Chinese Academy of Sciences

2:50 PM

Nanoparticle-Enabled Phase Domain Growth Control during Solidification Processing: *Lianyi Chen*¹; Jiaquan Xu¹; Xiaochun Li¹; ¹University of California at Los Angeles

3:10 PM

An Investigation of Dendritic Segregation in Directionally Solidified CMSX-4 Superalloy: Gheorghe Matache¹; *Doru Stefanescu*²; Cristian Puscasu¹; Elvira Alexandrescu¹; ¹INCDT COMOTI; ²The Ohio State University and The University of Alabama

3:30 PM

Modeling of Casting Defects In an Integrated Computational Materials Engineering Approach: Adrian Sabau¹; ¹Oak Ridge National Laboratory

3:50 PM Break

4:10 PM Invited

X-ray Observations Showing the Effect of Fluid Flow on Dendritic Solidification in Ga-In Alloys: Natalia Shevchenko¹; Olga Roshchupkina¹; *Sven Eckert*¹; ¹Helmholtz Zentrum Dresden-Rossendorf

4:35 PM

Advances on 3D Stochastic Modeling of Microstructure Evolution during the Solidification of Dendritic Alloys: Daojie Zhang¹; *Laurentiu Nastac*¹; ¹The University of Alabama

4:55 PM

Observation of the Solidification Microstructure of GCr15 Bearing Steel Billets: *Lifeng Zhang*¹; Shengqian Wang¹; ¹University of Science and Technology Beijing

5:15 PM

Phase Field Modelling of Multiple Dendrites with Different Growth Orientations and Constant Cooling Rate: *Alexandre Ferreira*¹; Monira Valente¹; Dimas Moraes¹; ¹Universidade Federal Fluminense

Advances in Thin Films for Electronics and Photonics — Functional and Multifunctional Materials

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee

Program Organizers: Federico Rosei, INRS; Nuggehalli Ravindra, New Jersey Institute of Technology; Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Terry Alford, Arizona State University

Wednesday PM	Room: Europe 7
March 18, 2015	Location: Dolphin

Session Chair: Sylvain Cloutier, École de Technologie Supérieure

2:00 PM Invited

Ion Beam Modification of Sliding Contact Materials: Nanoscale Observations to Implementation: *Daniel Bufford*¹; Jon-Erik Mogonye¹; Khalid Hattar¹; Somuri Prasad¹; ¹Sandia National Laboratories

2:25 PM Invited

Structure Tuning of Titania Nanotubes for Physical-Photochemical Multi-Functionalization: *Tohru Sekino*¹; ¹Osaka University

2:50 PM

New Multicomponent Antimonite Glasses for Non-Linear Optical Applications: *Ali Erçin Ersundu*¹; Miray Celikbilek¹; Mohamed Toufik Soltani²; Süheyla Aydin³; ¹Nisantasi University; ²University of Biskra; ³Istanbul Technical University

3:10 PM

Adhesion of Ge Electrode to Ni Substrate for Li Ion Battery Applications: *Aadithya Jeyaranjan*¹; Alex Volinsky¹; Nicholas Rudawski²; Kevin Jones²; ¹University of South Florida; ²University of Florida

3:30 PM Break

3:50 PM Invited

Fabrication and Charge-Transfer Dynamics in PbS and PbSe Quantum Dot-Based Heterostructures: Fan Xu¹; Xin Ma¹; Chelsea R. Haughn¹; Jaime Benavides²; Luis F. Gerlein²; Matthew F. Doty¹; *Sylvain Cloutier*²; ¹University of Delaware; ²École de Technologie Supérieure

4:15 PM

E-Beam Induced Effects in Ge-Se Based Redox Conductive Bridge Memory Devices and Thin Films: *Maria Mitkova*¹; Kasandra Wolf¹; Dmitri Tenne¹; Mahesh Ailavajhala¹; Hugh Barnaby²; Michael Kozicki²; ¹Boise State University; ²Arizona State University

4:35 PM

Understanding and Exploiting the Electronic Interface in Stacked 2D Atomic Layered Materials: *Madan Dubey*¹; Matthew Chin¹; Barbara Nichols¹; Eugene Zakar¹; Robert Burk¹; Alex Mazzoni¹; Tyler Klarr¹; Glen Birdwell¹; Pankaj Shah¹; ¹US Army Research Lab

4:55 PM

Sol-Gel Dip Coated Vo2-Based Thin Films for Smart Window Applications: *Melis Can Özdemir*¹; Miray Celikbilek²; Ali Erçin Ersundu²; Süheyla Aydin¹; ¹Istanbul Technical University; ²Nisantasi University

5:15 PM

Comparison of Optical Properties of Silicon and Black Silicon: Sita Marthi¹; Suramya Sekhri¹; Nuggehalli Ravindra; ¹New Jersey Institute of Technology

Alumina and Bauxite — Alternative Raw Materials and Processes, Industrial Trends

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Hans-Werner Schmidt, Outotec GmbH

Wednesday PM March 18, 2015

Room: Southern Hemisphere IV Location: Dolphin

Session Chair: Linus Perander, Outotec GmbH

2:00 PM Introductory Comments

2:05 PM

Preparation of Zeolite 4A by Using High-Alumina Coal Fly Ash: Yan Shaoyong¹; *Zhang Ting'an*¹; Cheng Chu¹; Zhang Xianqi¹; Sun Junmin²; Lv Guozhi¹; Yang Huibin²; Zhang Weiguang¹; Li Yan¹; ¹Northeastern University; ²High Alumina Coal R&D Center of Datang International Power Generation Co., Ltd.

2:30 PM

Study of Filtration and Washing of Residue After HCl Leaching of Kaolin Clay: Andrey Panov¹; *Alexander Senyuta*¹; Andrey Smirnov¹; Alexander Damaskin¹; ¹RUSAL Engineering & Technology Centre

2:55 PM

Energy in Alumina Refining - Setting New Limits: Alessio Scarsella¹; ¹Outotec GmbH

3:20 PM

Sustainability and Alumina Refinery Design: Peter-Hans ter Weer¹; ¹TWS Services and Advice

3:45 PM Break

4:00 PM

Study on the Production of Ceramic Glass from Calcium-Silica Residue: Huilan Sun¹; Hao Zhang¹; *Bo Wang¹*; Shuo Rong¹; ¹Hebei University of Science and Technology

4:25 PM

WEDNESDAY PM

Preparation of Pseudo-boehmite by Using High-Alumina Coal Fly Ash: Zhang Xianqi¹; Zhang Ting'an¹; Feng Wei¹; Yan Shaoyong¹; Sun Junmin²; Lv Guozhi¹; Yang Huibin²; Jiang Xiaoli¹; ¹Northeastern University; ²High Alumina Coal R&D Center of Datang International Power Generation Co., Ltd.

4:50 PM Question and Answer Period

5:25 PM Concluding Comments

Aluminum Alloys: Development, Characterization, and Applications — Advanced Analysis

Sponsored by: TMS Light Metals Division, TMS: Aluminum Processing Committee

Program Õrganizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix,LLC; Tongguang Zhai, University of Kentucky

Wednesday PM	Room: Northern Hemisphere E4
March 18, 2015	Location: Dolphin

Session Chair: Gang Sha, Nanjing University of Science and Technology

2:00 PM Keynote

Effect of Si Addition on Precipitation Kinetics of Al-Cu-Mg Alloys: Gang Sha¹; ¹Nanjing University of Science and Technology

2:35 PM

High Temperature Creep Characterization of A380 Cast Aluminum Alloy – A Neutron Diffraction Study: Dimitry Sediako¹; Mike Walker²; Frank Czerwinski³; Wojciech Kasprzak³; ¹Canadian Neutron Beam; ²General Motors Corporation; ³CANMET Materials Technology Laboratory

2:55 PM

A Comparison of β' and β Phase Precipitation during Varying Heat Treatments in Al-Mg Alloys via In-Situ TEM: Daniel Scotto D'Antuono¹; Daniel Foley²; Jennifer Gaies³; William Golumbfskie³; Mitra Taheri⁴; ¹Drexel University ; ²University of Maryland; ³Naval Surface Warfare Center; ⁴Drexel University

3:15 PM

Hydrogen Visualization in the Deformed Microstructure of Al-Zn-Mg Base Alloys: *Keitaro Horikawa*¹; Tanigaki Kenichi¹; Hidetoshi Kobayashi¹; ¹Osaka University

3:35 PM Break

3:50 PM

Hydrogen Trapping Behaviors in Al-Zn-Mg-Cu Alloys: Peng Zhang¹; *Md Shahnewaz Bhuiyan*¹; Hiroyuki Toda¹; Keitaro Horikawa²; Kentaro Uesugi³; Akihisa Takeuchi³; Yoshio Suzuki³; Nobuto Sakaguchi⁴; Yoshio Watanabe⁴; ¹Kyushu University; ²Osaka University; ³Japan Synchrotron Radiation Research Institute; ⁴UACJ Corporation

4:10 PM

Investigation of the Structural Stability of Nanostructured Al-5.7wt.%-Ni Mechanically Alloyed Eutectic Alloy Powder: *Mohyeldin Ragab*¹; Hanadi Salem²; ¹North Dakota State University; ²The American University in Cairo

4:30 PM

Optimization of Degassing Parameters for Nanocrystalline AA5083 Powder: *Clara Hofmeister*¹; Frank Kellogg²; Anit Giri³; Kyu Cho⁴; Yongho Sohn¹; ¹University of Central Florida; ²Bowhead Science and Technology; ³TKC Global; ⁴US Army Research Laboratory

4:50 PM

Embrittlement of Al-Based Alloys with Liquid Ga as a Way to Study of Grain Boundary Composition: *Rodin Alexey*¹; Ksenia Kovaleva¹; Dmitrii Podgornyi¹; ¹National University of Science and Technology "MISiS"

5:10 PM

A Comprehensive Study on the Effect of Retrogression and Reaging on the Properties of Aluminium Alloy Conforming to AA 7049 Specification: *Muralidhara Krishnappa*¹; Ranganatha Rangegowda²; ¹University Visvesvaraya College of Engineering; ²S. J. C. Institute of Technology

Aluminum Alloys: Development, Characterization, and Applications — Deformation and Texture

Sponsored by: TMS Light Metals Division, TMS: Aluminum Processing Committee Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum;

Subodh Das, Phinix,LLC; Tongguang Zhai, University of Kentucky

Wednesday PM	Room: Northern Hemisphere E3
March 18, 2015	Location: Dolphin

Session Chair: Xiyu Wen, University of Kentucky

2:00 PM

Evaluation of Forming Limit Diagram of Aluminum Alloy 6061-T6 at Ambient Temperature: Manoj Sharma¹; *Jyoti Mukhopadhyay*¹; ¹Institute of Technology Gandhinagar

2:20 PM Invited

On Microstructures, Textures and Electric Resistivity of AA1350 Alloy Sheets after Annealing: *Xiyu Wen*¹; Jingwu Zhang²; Shridas Ningileri³; ¹University of Kentucky; ²State Key Laboratory of Metastable Materials Science and Technology; ³University of Kentucky/Secat Inc.

2:40 PM

Twinning in Al and Al Alloys: Leonardo Velasco¹; Andrea Hodge¹; ¹University of Southern California

3:00 PM

Characterizing and Modeling the Deformation of AA5182 for Hot Blank – **Cold Die (HB-CD) Stamping:** Nan Zhang¹; *Fadi Abu-Farha*¹; ¹Clemson University
3:20 PM

Correlation between Deformation Route and Microstructural Evolution of 6061 Al Alloy Deformed by Differential Speed Rolling: *Haewoong Yang*¹; Mosab Kaseem¹; Young Gun Ko¹; ¹Yeungnam University

3:40 PM Break

3:50 PM

The Portevin-Le Châtelier Effect in a Rheocast Al-Si-Cu Alloy: Anders Jarfors¹; Nils-Eric Andersson¹; Toni Bogdanoff¹; Mostafa Payandeh¹; Salem Seifeddine¹; Alexander Leickt¹; Aron Tapper¹; ¹JTH

4:10 PM

An Investigation on High-Rate Formability of High-Strength Aluminum Alloys: A Study on Objectivity of Measured Strain and Strain-Rate: Piyush Upadhyay¹; *Aashish Rohatgi¹*; Elizabeth Stephens¹; Richard Davies¹; David Catalini¹; ¹Pacific Northwest National Laboratory

4:30 PM Invited

The Surface Necking Forming Mechanism in an AA6016 Automotive Sheet during Bending: *Q. Zhang*¹; P.Z. Zhao¹; J.D. Liu¹; Y.J. Feng¹; ¹CHINALCO Research Institute of Science and Technology

4:50 PM

Effects of Stretch Forming on Aging and Corrosion of Third Generation Al-Li Alloys: *Ellen Wright*¹; Michael Kaufman¹; ¹Colorado School of Mines

Aluminum Reduction Technology — Operations and Energy Consumption

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pascal Lavoie, LMRC

Wednesday PMRoom: Southern Hemisphere IIIMarch 18, 2015Location: Dolphin

Session Chair: Claude Fradet, Rio Tinto Alcan

2:00 PM Introductory Comments

2:05 PM

On-line Monitoring of Individual Anode Current to Understand and Improve the Process Control at Alouette: *Lukas Dion*¹; Charles-Luc Lagacé²; James Evans³; Ron Victor³; László Kiss¹; ¹Université du Québec à Chicoutimi; ²Aluminerie Alouette Inc.; ³Wireless Industrial Technologies

2:30 PM

High Frequency Measurements of Current through Individual Anodes: Some Results from Measurement Campaigns at Hydro: *Steinar Kolas*¹; Phillip McIntosh¹; Asbjørn Solheim²; ¹Hydro; ²SINTEF

2:55 PM

Frequency Response Analysis of Electrolysis Cell Voltage Signals during the Alumina Feed Cycles: *Luísa Azevedo*¹; Nilton Nagem²; João da Fonseca Neto¹; ¹Federal University of Maranhão (UFMA); ²Aluminum Consortium of Maranhão (ALUMAR)

3:20 PM

Experiments on Measurement of Online Anode Currents at Anode Beam in Aluminum Reduction Cells: *Shuai Yang*¹; Zhong Zou¹; Jie Li¹; Hong-liang Zhang¹; ¹Central South University in China

3:45 PM Break

4:00 PM

Investigation of Cathode & Collector Bar Modification on Thermal Balance of a Low Amperage Cell: *Amit Gupta*¹; Saibal Modak¹; Mahesh Sahoo²; Jinil Janardhanan²; ¹Aditya Birla Science & Technology Company Ltd.; ²Hindalco Industries Ltd.

4:25 PM

Trading Current or Resistance for Metal Depth to Maintain Ledge: Richard Beeler¹; *Donald Ziegler*¹; ¹Alcoa Inc.

4:50 PM

Reduction in Power Consumption at UC RUSAL'S smelter 2012-2014: Victor Buzunov¹; Viktor Mann²; Nikolay Pitertzev²; Gennady Arkhipov¹; Viktor Chesnyak¹; ¹RUSAL "Engeneering and Technological Center"; ²UC RUSAL

5:15 PM

Aspects of Change Management and Process Management at Some Smelters: *Yashuang Gao*¹; Albert Mulder¹; Mark Taylor; John Chen¹; ¹University of Auckland

Biological Materials Science Symposium — Biointerfaces for Biomedical Applications

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Kalpana Katti, North Dakota State University; Rajendra Kasinath, DePuy Synthes Products, LLC; Michael Porter, Clemson University; Francois Barthelat, McGill University

Wednesday PM March 18, 2015 Room: Swan 9 Location: Swan

Session Chairs: Rajendra Kasinath, DePuy Synthes Products, LLC; Francois Barthelat, McGill University

2:00 PM Invited

Biomimetic Interfaces for Peptide Mediated Antimicrobial Implant Coatings: Deniz Yucesoy¹; Nicole Chin²; Sarah VanOosten¹; Marketa Hnilova¹; *Candan Tamerler*¹; ¹University of Kansas; ²University of Washington

2:30 PM

Displacements of Bacterial Cells on Activated Photocatalytic Films: X. Wang¹; J. Zhang¹; Q. Li¹; F. Fang²; *J. Shang³*; ¹Institute of Metal Research; ²Southeast University; ³University of Illinois

2:50 PM

Magnetic Nanocomposites for Localized Hyperthermia Treatment of Breast Cancer: Kwabena Kan-Dapaah¹; ¹Worcester Polytechnic Institute

3:10 PM

Prior Evaluation of Bioactive Coatings of Blood Contacting Applications: *Narayana Garimella*¹; ¹University at Buffalo

3:30 PM Break

3:50 PM

Adhesion of Blood Platelets in TiO₂ Coatings: Jonathan M. Schuster¹; Maria Laura Vera¹; Margarita E. Laczeski²; *Carlos E. Schvezov*¹; Mario R. Rosenberger¹; ¹IMAM (UNaM-Conicet); ²InBioMis (UNaM)

4:10 PM

Translation of Mg Alloy Properties to Stent Performance: *Jacob Edick*¹; Dennis Boismier¹; Jan Weber¹; ¹Boston Scientific

4:30 PM

Biomimetic Surface Treatment of Titanium Alloys Associated Electrospinning: *Ana Paula Alves Claro*¹; Marisa Souza¹; Rosemeire Almeida²; Marcos Akira²; Maria Cristina Alves Rezende¹; ¹UNESP; ²Unicamp

4:50 PM

Optical and Imaging Properties of Highly Luminescent Water Soluble Type II CdTe/CdSe Nanoparticles Synthesised via a Green Method: Vuyelwa Ncapayi¹; *Oluwafemi Oluwatobi*¹; Sandile Songca²; ¹Cape-Peninsula University of Technology; ²Walter Sisulu University

5:10 PM

Production and Characterization of Magnesium Based Composites: *Ziya Esen*¹; Ezgi Bütev¹; Emre Yilmaz¹; ¹Cankaya University

Bulk Metallic Glasses XII — Mechanical and Other Properties

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Hahn Choo, University of Tennessee; Yanfei Gao, University of Tennessee

Wednesday PM	Room: Asia 3
March 18, 2015	Location: Dolphin

Session Chairs: Dong Ma, Oak Ridge National Laboratory; Yunfeng Shi, Rensselaer Polytechnic Institute

2:00 PM Invited

Intrinsic Amorphous Structure Difference in Ductile and Brittle ZrCu Metallic Glasses: *Gong Li*¹; Sibo Gao²; P.K. Liaw¹; ¹University of Tennessee; ²The University of British Columbia

2:25 PM

Applying Computational Fluid Dynamics to Bulk Metallic GlassManufacturing Processes:Joseph Stevick¹; Stephanie O'Keeffe¹; SeanO'Keeffe¹; Adam Verreault¹; Glenton Jelbert¹; ¹Liquidmetal Technologies

2:45 PM

Stress Corrosion Interactions of the Bulk Glassy Zr_{52.5}Cu_{17.9}Al₁₀Ni₁₄₆Ti₅ Alloy: *Petre-Flaviu Gostin*¹; Daniel Grell²; Margitta Uhlemann¹; Jürgen Eckert¹; Eberhard Kerscher²; Annett Gebert¹; ¹IFW Dresden; ²University of Kaiserslautern

3:05 PM Invited

Relaxation and Elastic-Plastic Crossover Phenomenon in a Bulk-Metallic-Glass Matrix Composite: *Yi-Chuan Chao*¹; Wen-Jay Lee²; Junwei Qiao³; E-Wen Huang⁴; ¹National Central University; ²National Center for High-Performance Computing; ³Taiyuan University of Technology; ⁴National Chiao Tung University

3:30 PM

Repetitive Ultra-Low Stress Induced Nanocrystallization in Amorphous Cu-Zr-Al Alloy Evidenced by In Situ Nanoindentation: Yue Liu¹; Jie Jian¹; J.H. Lee¹; C. Wang²; Q.P. Cao²; C. Gutierrez¹; Haiyan Wang¹; J. Z. Jiang²; *Xinghang Zhang*¹; ¹Texas A&M University; ²Zhejiang University

3:50 PM Break

4:05 PM

The Extended Defect and Its Percolation during the Deformation of Metallic Glasses: A Simulation Study: *Pengyang Zhao*¹; Ju Li²; Yunzhi Wang¹; ¹The Ohio State University; ²Massachusetts Institute of Technology

4:25 PM

Laser Deposition as a Combinatorial Tool for Discovering New Metallic Glass Alloys: *Peter Tsai*¹; Katharine Flores¹; ¹Washington University in St. Louis

4:45 PM

Trigger Mechanism of Deformation in Bulk Metallic Glass: *Yue Fan*¹; Takuya Iwashita²; Takeshi Egami²; ¹Oak Ridge National Laboratory; ²University of Tennessee, Knoxville

5:05 PM Invited

Xe Ion Irradiation Induced Surface Homogeneity in a Metallic Glass: Xilei Bian¹; *Gang Wang*¹; K.C. Chan²; H.C. Chen³; Long Yan³; Na Zheng⁴; A. A. Teresiak⁴; Yulai Gao¹; Qijie Zhai¹; Norbert Mattern⁴; Jurgen Eckert⁴; P.K. Liaw⁵; Karin Dahmen⁶; ¹Shanghai University; ²The Hongkong Polytechnic University; ³Chinese Academy of Sciences; ⁴IFW-dresden; ⁵University of Tennessee; ⁶University of Illinois at Urbana Champaign

5:25 PM

Development of Zr-Cu-Based Bulk Metallic Glasses with Super High Glass Forming Ability: *Hongbo Lou*¹; X.D. Wang¹; K. Ge¹; Q.P. Cao¹; Jianzhong Jiang¹; ¹Zhejiang University

Bulk Metallic Glasses XII — Structures and Modeling

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Hahn Choo, University of Tennessee; Yanfei Gao, University of Tennessee

Wednesday PM	Room: Asia 4
March 18, 2015	Location: Dolphin

Session Chairs: Karin Dahmen, University of Illinois at Urbana Champaign; Yanfei Gao, The University of Tennessee

2:00 PM Invited

Modeling Plastic Deformation and the Statistics of Serrations in the Stress versus Strain Curves of Bulk Metallic Glasses and Other Materials: *Karin Dahmen*¹; James Antonaglia¹; Wendelin Wright²; Xiaojun Gu²; Xie Xie³; Michael LeBlanc¹; Junwei Qiao⁴; Yong Zhang⁵; Todd Hufnagel⁶; Jonathan Uhl; Peter Liaw³; ¹University of Illinois at Urbana Champaign; ²Bucknell University; ³University of Tennessee; ⁴Taiyuan University of Technology; ⁵University of Science and Technology Beijing; ⁶Johns Hopkins University

2:25 PM Invited

A Predictive Topological Model for Bulk Metallic Glasses: Kevin Laws¹; Dan Miracle²; Michael Ferry¹; ¹UNSW; ²AF Research Laboratory

2:50 PM Invited

Correlating Microscopic Structural Heterogeneity to Ductile-to-Brittle Transition in Metallic Glasses: *Yanfei Gao*¹; Weidong Li¹; Hongbin Bei²; ¹University of Tennessee; ²Oak Ridge National Laboratory

3:15 PM Invited

Thermodynamic Fragility in Simulated Metallic Glasses: *James Morris*¹; A. Arrico²; Takeshi Egami²; ¹Oak Ridge National Laboratory; ²University of Tennessee

3:40 PM Break

3:55 PM Invited

Nanomechanics of Metallic Glass: What Have We Learned from Atomistic Modeling?: *Mo Li*¹; Qi Zhang¹; Luo Yun²; Qi-Kai Li³; ¹Georgia Institute of Technology; Tsinghua University; ²Georgia Institute of Technology; Tsinghua University; ³Georgia Institute of Technology

4:15 PM Invited

Intrinsic and Extrinsic Ductility of Metallic Glasses: Yunfeng Shi¹; ¹Rensselaer Polytechnic Institute

4:35 PM Invited

Microstructural Factors of Strain Delocalization in Model Metallic Glass Matrix Composites: Thomas Hardin¹; *Eric Homer*²; ¹Massachusetts Institute of Technology; ²Brigham Young University

4:55 PM Invited

High-Entropy Bulk Metallic Glasses: Formation and Properties: *Michael Gao*¹; Mike Widom²; Jeff Hawk³; ¹National Energy Technology Lab/URS; ²Carnegie Mellon University; ³NETL

5:15 PM Invited

Study of Glass Dynamics and Relaxation Behavior of Cu-Zr-Al Metallic-Glass Films by Molecular Dynamics Simulation: *Yunche Wang*¹; Chun-Yi Wu¹; Nai-Hua Yeh¹; Peter Liaw²; ¹National Cheng Kung University; ²University of Tennessee

Cast Shop for Aluminum Production — General Cast Shop

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pete Forakis, STAS Middle East

Wednesday PMRoom: Southern Hemisphere IIMarch 18, 2015Location: Dolphin

Session Chair: Mohamed Ali, Masdar Institute

2:00 PM Introductory Comments

2:05 PM

A Method of Measuring the Sticking Strength of Alloy A380 on Bare and Coated Die Steels: *Bo Wang*¹; Gerald Bourne¹; Stephen Midson¹; Andras Korenyi-Both¹; Michael Kaufman¹; ¹Colorado School of Mines

2:30 PM

Deformation of the Aluminum Bath Surface in an Induction Melting Furnace: Akshay Bansal¹; Pierre Chapelle¹; Yves Delannoy²; Emmanuel Waz³; Pierre LeBrun³; Jean-Pierre Bellot¹; ¹University of Lorraine; ²University of Josef Fourier - Grenoble INP; ³Constellium Technology Center

2:55 PM

The History and Future of Aluminum Dross Processing: David Roth¹; ¹GPS Global Solutions

3:20 PM

Recycling of Die Cast Aluminum A380 Machining Chips: *Bojun Xiong*¹; Xuezhi Zhang¹; Henry Hu¹; Chi Liu²; Li Fang¹; ¹University of Windsor; ²Magna Powertrain

3:45 PM Break

4:00 PM

Production and Certification of Metallic Certified Reference Materials for the Analysis of Aluminium Alloys: *Hafida Hamouche*¹; Jean-François Archambault¹; Claude Dupuis¹; ¹Rio Tinto Alcan

4:25 PM

Recycling of Automotive Wrought Alloys: *Ray Peterson*¹; ¹Aleris International Inc.

Characterization of Minerals, Metals, and Materials — Characterization of Minerals

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chenguang Bai, Chongqing University; Juan Pablo Escobedo, University of New South Wales; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Neves Monteiro, Military Institute of Engineering, IME, Materials Science Department; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal; Jian Li, CanmetMATERIALS

Wednesday PM	Room: Macaw 2
March 18, 2015	Location: Swan

Session Chairs: Bowen Li, Michigan Tech; Zhiwei Peng, Michigan Tech

2:00 PM

Fiber Reinforcement of Andalusite at High Temperature: Bowen Li¹; Mingsheng He²; Jiann-Yang Hwang¹; Xiaodi Huang¹; ¹Michigan Technological University, WISCO; ²Wuhan Iron & Steel Group

2:20 PM

Elemental Identification of Surface and Subsurface Particles within a Mineralogical Core using Micro X-ray Computed Tomography and Confocal Micro X-ray Fluorescence Spectroscopy: Nikolaus Cordes¹; Srivatsan Seshadri²; Michael Feser²; Xiaoli Yuan³; Ying Gu³; Deming Wang³; George Havrilla¹; Brian Patterson¹; ¹Los Alamos National Laboratory; ²Carl Zeiss X-ray Microscopy, Inc.; ³Julius Kruttschnitt Mineral Research Centre

2:40 PM

Characterization of Feldspar by Instrumental Analytical Techniques: Adele Garkida¹; Zainab Aliyu¹; Edwin Ali¹; Muhammad Dauda¹; ¹Ahmadu Bello University

3:00 PM

Microwave Power Absorption Characteristics of Iron Oxides: *Zhiwei Peng*¹; Jiann-Yang Hwang²; Matthew Andriese²; Yuzhe Zhang²; Guanghui Li¹; Tao Jiang¹; ¹Central South University; ²Michigan Technological University

3:20 PM Break

3:40 PM

Qualitative and Mineralogical Characterization of Lead Deposit in Ishiagu, Ebonyi State, Nigeria: *Gerald Onyedika*¹; Kelechukwu Onwukamike²; Martin Ogwuegbu¹; Chidi Onyenehide¹; ¹Federal University of Technology, Owerri; ²Institute of Physics, University of Augsburg, Germany

4:00 PM

Sintering Characteristics of Iron Ores with Addition of Laterite Nickel Ores: *Xinyu Li*¹; Jianliang Zhang¹; Chaoquan Yao¹; Yapeng Zhang¹; Zhiwen Shi¹; Fei Wang¹; ¹University of Science and Technology, Beijing

Characterization of Minerals, Metals, and Materials — Characterization of Soft Materials

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chenguang Bai, Chongqing University; Juan Pablo Escobedo, University of New South Wales; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Neves Monteiro, Military Institute of Engineering, IME, Materials Science Department; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal; Jian Li, CanmetMATERIALS

Wednesday PM	Room: Mockingbird 1
March 18, 2015	Location: Swan

Session Chairs: Brian Patterson, Los Alamos National Laboratory; Sergio Monteiro, Military Institute of Engineering

2:00 PM

Dynamic In-situ Compression with Synchrotron 3D Tomographic Imaging of Cellular Materials: *Brian Patterson*¹; Nikhilesh Chawla²; Sudhanshu Singh²; Myrtle Lin²; Jason Williams²; Xianghui Xiao³; Mathew Robinson⁴; Zachary Smith¹; Kevin Henderson¹; Nikolaus Cordes¹; ¹Los Alamos National Laboratory; ²Arizona State University; ³Argonne National Laboratory; ⁴Atomic Weapons Establishment

2:20 PM

Constitutive Modeling of a Glass Fiber-Reinforced PTFE Gasketed-Joint Under a Re-Torque: James Williams¹; Ali Gordon¹; ¹University of Central Florida

2:40 PM

Microwave Absorption Characteristics of Tire: *Yuzhe Zhang*¹; Jiann-Yang Hwang¹; Zhiwei Peng¹; Matthew Andriese¹; Bowen Li¹; Xiaodi Huang¹; ¹Michigan Technological University

3:00 PM

Optical Evaluation for Biomimetic Microlens Array on PDMS Sheet: *Kenji Monden*¹; ¹Denki Kagaku Kogyo K.K.

3:20 PM

Behavior of Linear Low Density Polyethylene Under UV Ageing for Agricultural Application: *Patricia Poveda*¹; Hamilton Viana²; Leonardo Silva¹; ¹Instituto de Pesquisas Energéticas e Nucleares - IPEN/CNEN-SP; ²Centro Universitário Fundação de Santo André - FSA/FAENG

3:40 PM Break

3:50 PM

Photoacoustic Thermal Characterization of Malva Fibers: Jean Margem¹; Frederico Margem²; Vinicius Gomes²; Marina Margem²; Rafael Castro¹; Sergio Monteiro³; Carolina Ribeiro²; ¹Instituto de Ensino Superiores do Censa, ISECENSA; ²UENF -State University of the Northern Rio de Janeiro; ³IME-Military Institute of Engineering

4:10 PM

Characterization of Hydrophobic Aerogel For Insulation Application: Mehmet Burcin Piskin¹; Nevin Karamahmut Mermer¹; Muge Sari Yilmaz¹; Ozgul Dere Ozdemir¹; ¹Yildiz Technical University

4:30 PM

Assessing Viscoelastic Properties of Polydimethylsiloxane (PDMS) Using Loading and Unloaing of the Compression Test: *Mustafa Fincan*¹; Alex Volinsky¹; Zhixin Wang¹; Nathan Gallant¹; ¹University of South Florida

4:50 PM

Mechanical, Morphological and Thermal Properties of Açaí Fibers Reinforced Biodegradable Polymer Composites: *Célio Wataya*¹; Roberta Lima¹; Rene Oliveira¹; Esperidiana Moura¹; ¹Instituto de Pesquisas Energéticas e Nucleares

5:10 PM

Influence of Clay Exfoliation on the Properties of EVOH/Clay Flexible Films: Messias Machado¹; Renato Godoy²; Andressa Silva²; Roberta Lima²; Rene Oliveira²; Francisco Valenzuela-Díaz¹; *Esperidiana Moura²*; ¹Universidade de São Paulo; ²Instituto de Pesquisas Energéticas e Nucleares

Computational Modeling and Stochastic Methods for Materials Discovery and Properties — Materials for Energy Applications

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Dallas Trinkle, University of Illinois at Urbana-Champaign; Mikhail Mendelev, Ames Laboratory; Adri van Duin, Pennsylvania State University

Wednesday PM	Room: Northern Hemisphere A4
March 18, 2015	Location: Dolphin

Session Chairs: Yue Qi, Michigan State University; Richard Hennig, University of Florida

2:00 PM Invited

Predicting Lithium and Electron Transport in Solid Electrolyte Interphases in Li-Ion Batteries: Yue Qi^{1} ; ¹Michigan State University

2:30 PM

Unraveling Catalytic Mechanism of Co3O4 for Oxygen Evolution Reaction in Li-O₂ Battery: *Jianjun Liu*¹; ¹Shanghai Institute of Ceramics, Chinese Academy of Sciences

2:50 PM

Computational Design of Nanosegregated Pt Alloy Catalysts: *Guofeng Wang*¹; Zhiyao Duan¹; Shyam Kattel¹; ¹University of Pittsburgh

3:10 PM

Atomic Scale Investigation of Ni₃AlX Alloys Using a Combined First-Principles and Statistical Learning Approach: *Aakash Kumar*¹; Scott Broderick²; Aleksandr Chernatynskiy¹; Adedapo Oni³; James LaBeau³; Krishna Rajan²; Simon Phillpot¹; Susan Sinnott¹; ¹University of Florida; ²Iowa State University; ³North Carolina State University

3:30 PM Break

3:45 PM

Computational Modeling of Structural and Dynamic Properties of Al-Li-Zn and Al-Li-Cu Alloys: *Marcela Trybula*¹; Tomasz Gancarz¹; Louis Hennet²; Wladyslaw Gasior¹; Alain Pasturel³; ¹Institute of Metallurgy and Materials Science; ²CEMHTI-CNRS UPR3079; ³Science et Ingénierie des Matériaux et Procédés,

4:05 PM

Multi-Objectives Computational Design of Nickel-Based Superalloys: *Edern Menou*¹; Philippe Leray²; Gérard Ramstein²; Franck Tancret¹; ¹Institut des matériaux Jean Rouxel; ²Laboratoire d'Informatique de Nantes Atlantique

4:25 PM

ReaxFF Molecular Dynamics Simulation on Oxidation Behaviors of 3C-SiC: Uniaxial Strain Effect: *Yu Sun*¹; Yijun Liu¹; Fei Xu¹; ¹Northwestern Polytechnical University

4:45 PM

Developing Multiscale Models to Understand the Mechanics of Transition Metal Carbides: *Christopher Weinberger*¹; Hang Yu¹; Xiao-Xiang Yu²; Nicholas De Leon²; Duraivelan Palanisamy¹; Gregory Thomspon²; ¹Drexel University; ²University of Alabama

5:05 PM

Predictive Simulations of Amorphous Polymers: Processing and Ultimate Thermo-Mechanical Properties: *Alejandro Strachan*¹; Chunyu Li¹; Yae-ji Kim¹; ¹Purdue University

Computational Thermodynamics and Kinetics — Energy-Storage Materials

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Maryam Ghazisaeidi, The Ohio-State University; Vidvuds Ozolins, University of California Los Angeles

Wednesday PM	Room: Oceanic 2
March 18, 2015	Location: Dolphin

Session Chairs: Stefano Curtarolo, Duke University; Christopher Wolverton, Northwestern University

2:00 PM Invited

Thermodynamics and Kinetics of Multivalent Energy Storage Materials from First-Principles: Kristin Persson¹; ¹LBNL

2:30 PM

A Molecular Dynamics Study of Lithium-Ion Intercalation in Battery Anode Materials: Christopher Shumeyko¹; Edmund Webb III¹; ¹Lehigh University

2:50 PM Invited

From Thermoelectrics to Superconductors: Advances in High-Throughput Accelerated Materials Development: Stefano Curtarolo¹; ¹Duke University

3:20 PM

Physically-Based Modeling of Redox Reactions in SOFC Anodes: Optimizing Materials and Microstructures for Fracture Resistance: *Joel Berry*¹; Fadi Abdeljawad¹; Ryan Davis¹; Alexander Hall¹; Mikko Haataja¹; ¹Princeton University

3:40 PM Break

4:00 PM

Molecular Structure and Ion Transport Near Electrode-Electrolyte Interfaces in Lithium-Ion Batteries: *Vincenzo Lordi*¹; Mitchell Ong¹; Osvalds Verners²; Adri Van Duin²; Erik Draeger¹; John Pask¹; ¹Lawrence Livermore National Laboratory; ²Penn State University

4:20 PM Invited

Materials Genome Approach to Computational Design of Nanostructured Thermoelectrics: *Chris Wolverton*¹; Jeff Doak¹; Shiqiang Hao¹; ¹Northwestern University

4:50 PM

Phase-Field Modeling of Electrochemical Crystal Growth in Li-Air Batteries: *Michael Welland*¹; Dieter Wolf¹; Jonathan Guyer²; ¹Argonne National Laboratory; ²National Institute of Standards and Technology

Computational Thermodynamics and Kinetics — Phase Diagrams and Phase Stability

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Maryam Ghazisaeidi, The Ohio-State University; Vidvuds Ozolins, University of California Los Angeles

Wednesday PM	Room: Oceanic 3
March 18, 2015	Location: Dolphin

Session Chairs: Richard Hennig, University of Florida; Axel van de Walle, Brown University

2:00 PM

First-Principles Investigation on the Phase Stability in Tantalum Carbides: *Xiao-xiang Yu*¹; Christopher Weinberger²; Gregory Thompson¹; ¹University of Alabama; ²Drexel University

2:20 PM

Thermodynamic Investigation on the LSM Perovskite CTE Behavior: Shadi Darvish¹; Ali Karbasi¹; Maria Mora¹; Yu Zhong¹; ¹Florida International University

2:40 PM

Ab Initio and CALPHAD Modeling of Phase Stability of Np-U-Zr for Metallic Nuclear Fuel Applications: *Wei Xie*¹; Wei Xiong¹; Dane Morgan¹; ¹University of Wisconsin-Madison

3:00 PM Invited

Rapid Prototyping of Phase Diagrams: *Axel van de Walle*¹; Qijun Hong¹; Sara Kadkhodaei¹; Ruoshi Sun¹; ¹Brown University

3:30 PM Break

3:45 PM

Free Energy Calculation of the Mechanically Unstable but Dynamically Stabilized bcc Phase of Titanium: *Sara Kadkhodaei*¹; Axel Van de Walle¹; ¹Brown University

4:05 PM

Thermodynamics, Anharmonicity, and the Metal-Insulator Transition in VO₂: *Jiawang Hong*¹; Olivier Delaire¹; John Budai¹; Michael Manley¹; Chen Li¹; Eliot Specht¹; Lynn Boatner¹; ¹Oak Ridge National Laboratory

4:25 PM

Using Sintering Aids in SPS of B4C with the Help from Computational Thermodynamics: *Mohammad Asadikiya*¹; Yu Zhong¹; Cheng Zhang¹; ¹MME Department of Florida International University

Constitutive Response and Modeling of Structural Materials: An SMD Symposium in Honor of G.T. Gray III's 60th Birthday — Constitutive Modeling

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Neil Bourne, University of Manchester; Eric Brown, Los Alamos National Laboratory; James Williams, Ohio State University; Kenneth Vecchio, University of California- San Diego

Wednesday PM	Room: Asia 2
March 18, 2015	Location: Dolphin

Session Chairs: Eric Brown, Los Alamos National Laboratory; Neil Bourne, University of Manchester

2:00 PM

Microstructure-Based Constitutive Model for Yield Strength and Strain Hardening of 5xxx-series Aluminum Alloys after Non-Isothermal Fire Exposure: *Patrick Summers*¹; Scott Case¹; Brian Lattimer¹; ¹Virginia Tech

2:20 PM

Low-Temperature Creep in Metals and Alloys: Descriptive Equations: Michael Kassner¹; *Kamia Smith*¹; ¹University of Southern California

2:40 PM

Micromechanics of Plastic Deformation and Phase Transformation in a Three-Phase TRIP-Assisted Advanced High Strength Steel: Experiments and Modeling: Ankit Srivastava¹; Hassan Ghassemi-Armaki¹; Hyokyung Sung¹; Peng Chen¹; Sharvan Kumar¹; Allan Bower¹; ¹School of Engineering, Brown University

3:00 PM

Investigation on Tensile Property and Constitutive Relationship for As-Quenched AlCu5Mn Alloy: Wenguang Wang¹; Gang Wang¹; Peng Du¹; Yiming Rong¹; ¹Institute of Manufacturing Engineering, Tsinghua University

3:20 PM

Microstructure-Based Simulations of a Pearlitic Steel: *Benjamin Anglin*¹; ¹US Army Research Laboratory

3:40 PM Break

4:00 PM

Model for Predicting the Plastic Anisotropy and Tension-Compression Asymmetry of Zr for 3D Loadings: Oana Cazacu¹; Philip Flater¹; *Nitin Chandola*¹; Benoit Revil-Baudard¹; ¹University of Florida

4:20 PM

Computer Assisted Microstructure Design of Dual-Phase Steels: *Sébastien Allain*¹; Olivier Bouaziz²; ¹Institut Jean Lamour; ²LEM3

4:40 PM

Experimental Study and Modeling of Ultra High Strength Low Alloy Steel Quenching Process: *Wei Shi*¹; Xiaohui Lin¹; Gang Wang¹; Huanyu Di¹; ¹Tsinghua University

5:00 PM

Thermostastitical Modelling of Twinning in Hexagonal-Closed Packed Alloys: *Enrique Galindo-Nava*¹; Pedro Rivera-Diaz-del-Castillo¹; ¹University of Cambridge

5:20 PM

Plastic Deformation of High-Purity Alpha-Titanium: Model Development and Validation Using the Taylor Cylinder Impact Test: Benoit Revil-Baudard¹; Oana Cazacu¹; *Philip Flater*²; Geremy Kleiser²; ¹University of Florida; ²Air Force Research Laboratory

5:40 PM

Physical Based Constitutive Model for the Prediction of Plastic Deformation of Fe-Cr-Ni Stainless Steel under High Strain Rate: Jianchao Yu¹; *Gang Wang*¹; Yiming Rong²; ¹Tsinghua University; ²Worcester Polytechnic Institute



Drying, Roasting, and Calcining of Minerals — Fluidization, Reduction Roasting, and Microwave Treatment

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizer: Thomas Battle, Midrex Technologies

Wednesday PM Room: Grand Harbor Salon 3 March 18, 2015 Location: Yacht & Beach

Session Chairs: Jerome Downey, Montana Tech of the University of Montana; Larry May, Hazen Research, Inc.

2:00 PM

Fluidization and Magnetization Roasting Technology Research on Siderite: Wen Chen¹; Zhenhong Liao¹; Xiaoyin Liu¹; Ligang Zhang¹; Jialin Li¹; Xinghua Liu1; 1Changsha Research Institute of Mining and Metallurgy Co., Ltd

2:20 PM

The Temperature Behavior and Microwave Thermo Gravimetric Analysis Characteristic of Ammonium Paratungstate in a Microwave Field: Cheng Fang¹; ¹Kun Ming University of Science and Technology

2:40 PM

Green Evaluation of Microwave Shaft Furnaces: Jin Chen¹; Guo Chen¹; Jinhui Peng¹; ¹Kunming University of Science and Technology

3:00 PM

Behavior of Phosphorus during Reduction Roasting of Oolitic Hematite Ore with High Phosphorus Content: Guanghui Li¹; Chongzhong Ouyang¹; Mingjun Rao1; Yuanbo Zhang1; Tao Jiang1; 1School of Minerals Processing and Bioengineering, Central South University

3:20 PM

Effect of Additives on Phase Transformation of Nickel Laterite Ore during Low-Temperature Reduction Roasting Process Using Carbon Monoxide: Li Bo1; Wei Yonggang2; Zhou Shiwei2; 1Kunming University of Science and Technology ; ²Kunming University of Science and Technology

3:40 PM Break

4:00 PM

Effect of Temperature on Reduction Roasting Of Low-Grade Iron Ore after Granulating with Coal: Zhucheng Huang¹; Ronghai Zhong¹; Jun Zou²; Tao Jiang1; 1Central South University; 2Qidong County Shunda Mining Co.,Ltd

4:20 PM

Reductive Decomposition of Lime/Iron Salt Sludge with Anthracite: Hua Wang1; Xing Zhu1; 1Kunming University of Science and Technology

4:40 PM

Metallic Tin Preparation from Cassirerite Concentrates by Gas-Based Reduction Roasting in the Presence of Na2CO3: Bingbing Liu¹; Zijian Su¹; Yuanbo Zhang¹; Jun Chen¹; Guanghui Li¹; Tao Jiang¹; ¹Central South University

5:00 PM

Thermo-Physical Properties of Petroleum Coke during Calcining Graphitization Process: Junhao Sheng¹; Mujun Long¹; Tao Liu¹; Dengfu Chen1; Yi Yang2; Shikai Gong2; Chunmei Chen2; 1Chongqing University; ²Guiyang Aluminium Magnesium Design & Research Institute Co., Ltd.

Dynamic Probing of Microstructure Evolution in Nanostructured Materials — Grain Boundaries Effects

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee Program Organizers: Nan Li, Los Alamos National Laboratory; Caizhi Zhou, Missouri University of Science and Technology; Dan Gianola, University of Pennsylvania; Marc Legros, CEMES-CNRS

Wednesday PM	Room: Mocking
March 18, 2015	Location: Swan

Session Chairs: Abigail Hunter, Los Alamos National Laboratory; Hao Wang, Institute of Metal Research

Mockingbird 2

2:00 PM

Effects of Grain Refinement on Friction and Wear of Metals: Ao Li¹; Izabela Szlufarska1; 1University of Wisconsin Madison

2:20 PM

Influences of Triple Junctions on Stress-Assisted Grain Boundary Motion in Nanocrystalline Materials: Mohammad Aramfard¹; Chuang Deng¹; ¹University of Manitoba

2:40 PM

In-Situ Irradiation-Transmission Electron Microscopy (TEM) Experiments on Ultrafine- and Nanocrystalline- Grained Tungsten Materials Prepared by Severe Plastic Deformation: Osman El-Atwani¹; Jonathan Hinks²; Graeme Greaves²; Jean Paul Allain¹; ¹Purdue University; 2University of Huddersfield

3:00 PM

Unusual Structural Transition in Titanium and Molybdenum Induced by Plastic Deformation: Hao Wang1; 1Institute of Metal Research, Chinese Academy of Sciences

3:20 PM

Grain Boundary Segregation and Thermal Stability of Nanocrystalline Alloys: A Phase Field Approach: Fadi Abdeljawad1; Stephen Foiles1; 1Sandia National Laboratories

3:40 PM Break

4:00 PM

Investigation of Deformation Twins Using a DFT-Informed 3D Phase Field Dislocation Dynamics (PFDD) Model: Abigail Hunter¹; Irene Beyerlein¹; ¹Los Alamos National Laboratory

4:20 PM

Mesoscale Modeling of Microstructure Evolution in Graded Nanocrystalline Materials: Zhanyang Chen1; Ying Chen1; 1Rensselaer Polytechnic Institute

Energy Technologies and Carbon Dioxide Management Symposium 2015 — Solar Energy

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee

Program Organizers: Animesh Jha, University of Leeds; Braiendra Mishra, Colorado School of Mines; Eric Peterson, Idaho National Lab; Cong Wang, Northeastern University; Neale Neelameggham, Ind LLC; Donna Guillen, Idaho National Lab; Li Li, Cornell University

Wednesday PM		
March	18, 2015	

Room: Grand Harbor Salon 4 Location: Yacht & Beach

Session Chairs: Li Li, Cornell University; Shulan Wang, Northeastern University

2:00 PM

Development of High Flux Solar Simulators for Solar Thermal Research: Ben Ekman¹; Geoffrey Brooks¹; M. Akbar Rhamdhani¹; John Grandfield²; ¹Swinburne University; ²Grandfield Technology Pty Ltd

2:20 PM

Functionalized TiO2 Demonstrating Enhanced Photoelectric Current Density for Potential Water Splitting Application: Manuel Giraldo¹; Shashank Saraf²; Hari Paudel²; Cathrine Shepard³; Tamil Sakthivel¹; Ankur Gupta¹; Michael Leuenberger²; Sudipta Seal²; ¹Advanced Materials Processing and Analysis Center, University of Central Florida; ²Nanoscience Technology Center, University of Central Florida; ³Department of Chemistry, Principa College

2:40 PM Invited

Nanostructure Engineering: A Robust Thruster to Boost the Performance of the Current Photovoltaic Devices: Ziqi Sun¹; Jung Ho Kim¹; Shi Xue Dou¹; ¹University of Wollongong

3:00 PM Invited

Polar Surface Domains and their Role in Photochemical Reactions: *Gregory Rohrer*¹; Ratiporn Munprom¹; Yisi Zhu¹; Paul Salvador¹; ¹Carnegie Mellon University

3:20 PM Break

3:40 PM Invited

Characterizing Hydrogen Bubble Nucleation and Growth during Electrolysis via In-Situ TEM: Shen Dillon¹; Yin Liu¹; ¹University of Illinois at Urbana-Champaign

4:00 PM

The Carbon Footprint in E-Waste Recycling - Indian Scenario: *Lakshmi Raghupathy*¹; ¹Consultant Sustainable Development

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) — Beneficial Use of Waste Products and Recycling

Sponsored by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Program Organizers: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory; Brian Bliss, Association for Iron and Steel Technology (AIST); Jeffrey Fergus, Auburn University; Ali Memari, Penn State University; Jonathan Motherwell, Jonathan T. Motherwell and Associates, LLC; Carol Russell, Environmental Protection Agency; Emily Sarver, Virginia Tech; Darlene Schuster, AICHE's Institute for Sustainability; Deborah Shields, Colorado State University

Wednesday PM	Room: Asbury A
March 18, 2015	Location: Yacht & Beach

Funding support provided by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Session Chairs: Diana A. Lados, Worcester Polytechnic Institute; Shafiq Alam, University of Saskatchewan

2:00 PM Introductory Comments

2:10 PM

Sustainability of Rare Earth Metals and Compounds in the United States: Brajendra Mishra¹; ¹Colorado School of Mines

2:35 PM

Carbothermal Reduction of Al-Si Alloy from Fly Ash of Electricity Power Plant: *Yudong Wang*¹; Yongnian Dai¹; ¹Kunming University of Science and Technology

3:00 PM

Developing Alternative Industrial Materials from Mining Waste: Javier Flores¹; Juan Hernández¹; *Miguel Pérez*¹; Francisco Patiño¹; José Ostos¹; Norma Trápala²; ¹Universidad Autónoma del Estado de Hidalgo; ²Alfarería "Los Toños" S.A de C.V.

3:25 PM Break

3:40 PM

Pilot-Scale Dechlorination of CuCl Residue from Zinc Hydrometallurgy by Microwave Roasting: Zhanyong Guo¹; ¹Kumming University of Science and Technology

4:05 PM

Preparation of Blocks from Tailings: Javier Flores¹; Juan Hernández¹; Eleazar Rodríguez¹; *Miguel Pérez*¹; Isauro Rivera¹; Ister Mireles¹; Eduardo Cerecedo¹; ¹Universidad Autónoma del Estado de Hidalgo

4:30 PM

Crystallization behaviour of glass-ceramic under various sintering atmospheres: *Liu Zhaobo*¹; Yanbing Zong¹; Hongxu Li¹; ¹University of Science and Technology Beijing

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) — Biomaterials, Biofuels and Green Chemistry

Sponsored by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Program Organizers: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory; Brian Bliss, Association for Iron and Steel Technology (AIST); Jeffrey Fergus, Auburn University; Ali Memari, Penn State University; Jonathan Motherwell, Jonathan T. Motherwell and Associates, LLC; Carol Russell, Environmental Protection Agency; Emily Sarver, Virginia Tech; Darlene Schuster, AICHE's Institute for Sustainability; Deborah Shields, Colorado State University

Wednesday PM March 18, 2015 Room: Asbury B Location: Yacht & Beach

Funding support provided by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Session Chair: John Craynon, Virginia Tech

2:00 PM Introductory Comments

2:10 PM

Melt Characteristics of Poly-Lactide (PLA) – Modified Agro-Wastes Fibre Composites: *Emmanuel Akpan*¹; Samson Adeosun²; Ganiu Lawal²; Sanmbo Balogun³; ¹Ambrose Alli University; ²University of Lagos; ³Bells University of Technology

2:35 PM

Improving the Engineering Properties of PLA for 3D Printing and Beyond: *David Roberson*¹; Carmen Rocha¹; Angel Torrado Perez¹; Joel English¹; Lauro Barberi¹; Ryan Wicker¹; ¹The University of Texas at El Paso

3:00 PM

Experimental Research on the Co-Combustion Interaction Among Bituminous Coal, Anthracite And Charcoal of Blast Furnace Blending Injection: *Tengfei Song*¹; Runsheng Xu¹; Haiyang Wang¹; ¹University of Science & Technology Beijing

3:25 PM Break

3:40 PM

Utilization of Straw Fiber as Reducing Agent in Rotary Hearth Furnace Process for DRI Production: *Dongping Duan*¹; Hongliang Han¹; Siming Chen¹; Ting Li¹; Hongzhang Chen²; ¹Key Laboratory of Green Process and Engineering, Institute of Process Engineering, Chinese Academy of Sciences; ²National Key Laboratory of Biochemical Engineering, Institute of Process Engineering, Chinese Academy of Sciences

4:05 PM

Determining the Energy Value on Different Compression of Sawdust Briquettes: Ifeanyichukwu Onyenanu¹; *Chukwunwendu Ilochonwu*²; Philip Tanmo¹; ¹Anambra State University; ²Scientific Equipment Development Institute, Enugu - Nigeria

Rechargeable Magnesium Batteries with Novel PVdF–PAN Graft Copolymer Electrolyte Membranes: Vatsala Jetti¹; ¹IICT

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) — Energy Challenges & Solutions

Sponsored by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Program Organizers: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory; Brian Bliss, Association for Iron and Steel Technology (AIST); Jeffrey Fergus, Auburn University; Ali Memari, Penn State University; Jonathan Motherwell, Jonathan T. Motherwell and Associates, LLC; Carol Russell, Environmental Protection Agency; Emily Sarver, Virginia Tech; Darlene Schuster, AICHE's Institute for Sustainability; Deborah Shields, Colorado State University

Wednesday PM March 18, 2015 Room: Asbury C Location: Yacht & Beach

Funding support provided by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Session Chair: Jonathan Motherwell, JTM & Associates

2:00 PM Introductory Comments

2:10 PM

High Temperature Fuel Cells for Efficient Conversion of Fossil Fuel Energy: Jeffrey Fergus¹; ¹Auburn University

2:35 PM

A Pathway to Near Zero Emission Electric Energy Through Additive Manufacture of Superconducting Electric Transmission Conduits: *Ian Sheehy*¹; ¹RMIT University

3:00 PM

Combustion Gas Absorption by Micro Algae, an Effective Way for Reducing Carbon Footprint in Developing Countries: Leonardo Di Mare¹; Antonio Bula¹; Pedro Villalba¹; ¹Universidad del Norte

3:25 PM Break

3:40 PM

WEDNESDAY PM

The INGRID project: Development of Solutions for Sustainable and Highly Interconnected Grids: *Fabrizio D'Errico*¹; Massimo Bertoncini²; Adamo Screnci³; ¹Politecnico di Milano; ²Engineering Ingegneria Informatica; ³Mc Phy Energy

4:05 PM

Study on the Effect of Heating Rate on Combustion and Kinetics of Pulverized Coal in Mixed O2/Co2 Atmosphere: Qing Shan¹; *Jingyi Zhang*¹; ¹Kunming University of Science and Technology

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) — Metrics, Design & Policy

Sponsored by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Program Organizers: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory; Brian Bliss, Association for Iron and Steel Technology (AIST); Jeffrey Fergus, Auburn University; Ali Memari, Penn State University; Jonathan Motherwell, Jonathan T. Motherwell and Associates, LLC; Carol Russell, Environmental Protection Agency; Emily Sarver, Virginia Tech; Darlene Schuster, AICHE's Institute for Sustainability; Deborah Shields, Colorado State University

Wednesday PM March 18, 2015 Room: Grand Harbor Salon 5 Location: Yacht & Beach

Funding support provided by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Session Chair: Darlene Schuster, Amer. Institute for Chemical Engineers

2:00 PM Introductory Comments

2:10 PM

An Interactive and Visual Tool for Sustainable Use of Materials in Engineering Design: Claes Fredriksson¹; ¹Granta Design

2:35 PM

Societal Implications of Nanotechnology: *Sharmila Mukhopadhyay*¹; ¹Wright State University

3:00 PM

Multi-Material Lightweight Vehicle ("MMLV"): *Lindita Bushi*¹; Tim Skszek²; David Wagner³; Jeff Conklin²; Matthew Zaluzec³; ¹Athena Sustainable Materials Institute; ²Magna International; ³Ford Motor Company

3:25 PM

Sustainable Solutions for Societal Needs Through Multifunctional Carbon Building Blocks: Sharmila Mukhopadhyay¹; ¹Wright State University

3:50 PM Break

4:05 PM

Energy and Cost Saving Through Metallurgical Treatments of Tools in Agriculture and Mining Sectors: *Amol Jha*¹; ¹CSIR-Advanced Materials and Processes Research Institute Bhopal, India

4:30 PM

Topology Optimization for Sustainability: *Natasha Vermaak*¹; Georgios Michailidis²; Guillaume Parry³; Rafael Estevez³; Gregoire Allaire²; Yves Brechet³; ¹Lehigh University; ²Ecole Polytechnique; ³Grenoble Institute of Technology

4:55 PM

Sustainability Metrics for Efficient and Innovative Residential Building Wall Systems: Ryan Solnosky¹; Ali Memari¹; ¹Penn State University

5:20 PM Invited

Synthesis and Self-Assembly of Nano-Sized 3D Conjugated Molecules.: *Hong Chen-Yang*¹; Wu San-Lien¹; Wu Kuan-Yi¹; Wang Chien-Lung¹; ¹National Chiao Tung University Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Antonios Kontsos, Drexel University

Wednesday PM	Room: Australia 3
March 18, 2015	Location: Dolphin

Session Chairs: Youshi Hong, Institute of Mechanics, Chinese Academy of Sciences; E-Wen Huang, National Chiao Tung University

2:00 PM Invited

The Effect of Chloride Concentration on Corrosion-Fatigue Crack Initiation Behavior of Precipitation-Hardened Stainless Steel (Custom 465-H950): Ryan Donahue¹; James Burns¹; ¹University of Virginia

2:20 PM

Effects of Machining On Fatigue Properties of a Nickel Based Superalloy for Aero-Engine Disc Applications: *Craig Knaggs*¹; Hangyue Li¹; Paul Bowen¹; Yue Li²; ¹University of Birmingham; ²Rolls-Royce plc

2:40 PM Invited

Effects of Stress Ratio on Crack Initiation Mechanism in High-Cycle and Very-High-Cycle Fatigue Regimes of High Strength Alloys: Youshi Hong¹; Xiaolong Liu¹; Chengqi Sun¹; ¹Institute of Mechanics, Chinese Academy of Sciences

3:00 PM

The Role of Surface Condition and Thermal Exposure on Fatigue Performance of High and Intermediate Strength Titanium-Aluminum Alloys: Zewen Huang¹; ¹School of Materials Science and Engineering, Southwest Jiaotong University

3:20 PM Break

3:30 PM

Sensitization Effects on Fracture and Fatigue of Al-Mg Naval Alloys: Mohsen Seifi¹; Henry Holroyd¹; John Lewandowski¹; ¹Case Western Reserve University

3:50 PM

Influence of Different Particle Sizes and Volume Fractions on the VHCF-Behavior Of Metal Matrix Composites: *Matthias Wolf*⁴; Dietmar Eifler¹; Guntram Wagner²; ¹University of Kaiserslautern; ²University of Chemnitz

4:10 PM

Influence of Inclusions on the Very-High-Cycle Fatigue Behavior of H13 Tool Steels: Paolo Matteis¹; *Donato Firrao*¹; Giorgio Scavino¹; Giorgio Chiandussi¹; Davide Salvatore Paolino¹; Massimo Rossetto¹; Andrea Tridello¹; ¹Politecnico di Torino

4:30 PM

Multiscale Model for Predicting Durability under Combined Fatigue and Environmental Loading: *Geeta Monpara*¹; Ray Fertig III¹; ¹University of Wyoming

Friction Stir Welding and Processing VIII — Friction Stir Related Technologies

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Rajiv Mishra, University of North Texas; Murray Mahoney, retired from Rockwell Scientific; Yutaka Sato, Tohoku University; Yuri Hovanski, Pacific Northwest National Laboratory

Wednesday PM March 18, 2015 Room: Northern Hemisphere A3 Location: Dolphin

Session Chair: Anthony Reynolds, University of South Carolina

2:00 PM Invited

FSW Technology for Marine Applications: Jonathan Martin¹; Sam Wei¹; ¹TWI Technology Centre (Yorkshire)

2:20 PM Invited

Miniaturized FSW Equipment for Manually Operated Welding: *Hidetoshi Fujii*¹; Koki Tamashiro¹; Masayoshi Kamai¹; Yoshiaki Morisada¹; ¹Osaka University

2:40 PM

Additive Friction Stir Deposition of Metal Powders: *Kumar Kandasamy*¹; Jacob Calvert¹; ¹Aeroprobe Corporation

3:00 PM

Analysis of Force Transients for Detecting Discontinuity during Friction Stir Welding: *Amber Shrivastava*¹; Michael Zinn¹; Christopher Smith²; Frank Pfefferkorn¹; ¹University of Wisconsin-Madison; ²Wolf Robotics LLC

3:20 PM

Semi Stationary Shoulder Bobbin-Tool (S³BT): A New Approach in Friction Stir Welding (FSW): *P Scupin*¹; Jorge dos Santos²; Norbert Huber²; ¹Daimler AG; ²Helmholtz-Zentrum Geesthacht

3:40 PM Break

4:00 PM

Evaluation of the Advantages of Rapid Refill FSSW of Aluminium Sheet for Automotive Structures: *Basem Mohysen Al-Zubaidy*¹; Ying-Chun Chen¹; Phil Prangnell¹; ¹The University of Manchester

4:20 PM

Friction Stir Welding: Exploring Advances to Position a Conventional Process in the Future Digital Landscape: Vicki Barbur¹; Jay McHenry¹; ¹Concurrent Technologies Corporation

4:40 PM

Effects of Friction Stir Back Extrusion on the Mechanical Properties and Microstructural Evolution in Magnesium and Aluminium Alloys: Justin Milner¹; Zeren Xu¹; Fadi Abu-Farha¹; ¹Clemson University

5:00 PM

Adding a Resistance Heat Source during Friction Stir Welding: Amit Arora¹; Pankaj Sahlot¹; ¹Indian Institute of Technology Gandhinagar

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High-Entropy Alloys III — Other Properties II

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Michael Gao, National Energy Technology Lab; Suveen Mathaudhu, University of California Riverside

Wednesday PM	Room: Oceanic 5
March 18, 2015	Location: Dolphin

Session Chairs: Paul Jablonski, US Department of Energy; Jeffrey Hawk, U.S. Department of Energy, National Energy Technology Laboratory

2:00 PM Invited

Manufacturing and Evaluation of High Entropy Alloys: *Paul Jablonski*¹; Joseph Licavoli¹; Michael Gao¹; Jeffrey Hawk¹; ¹US Department of Energy

2:20 PM

Theory of Solid Solution Strengthening in FCC High Entropy Alloys: *Céline Varvenne*¹; Aitor Luque Gomez¹; William Curtin¹; ¹Swiss Institute of Technology (EPFL)

2:40 PM Invited

High Temperature Properties of Gamma-Prime Bearing High Entropy Superalloys: An-Chou Yeh¹; Yao-Jen Chang¹; Te-Kang Tsao¹; Jien-Wei Yeh¹; ¹National Tsing Hua University

3:00 PM Invited

Synthesis and Simulation of High Entropy Alloys: Changning Niu¹; Alexander Zaddach¹; Tripp Hurt²; Adedapo Oni¹; James LeBeau¹; Carl Koch¹; *Douglas Irving*¹; ¹North Carolina State University; ²Furman University

3:20 PM Break

3:35 PM Invited

Atomistic Modeling of Solid-Solution Stability of High Entropy Alloys: Guofeng Wang¹; Yinkai Lei¹; ¹University of Pittsburgh

3:55 PM

The Epsilon Phase Fission Product - A Hexagonal Structured High Entropy Alloy: *Simon Middleburgh*¹; Daniel King¹; Gregory Lumpkin¹; ¹Australian Nuclear Science and Technology Organisation

4:15 PM Invited

Compositionally Complex Alloys as High-Temperature Materials? Mechanical Properties and Oxidation: Haneen Daoud¹; *Uwe Glatzel*¹; ¹University Bayreuth

4:35 PM

Thermal Conductivity of HEA: Magda Caro¹; Alfredo Caro¹; ¹Los Alamos National Laboratory

4:55 PM Invited

Effects of Additional Elements on the Mechanical Property of (Ti33Zr33Hf33)-(Ni50Cu50) High Entropy Alloys: Hae Jin Park¹; *Ki Buem Kim*¹; Jin Man Park²; Hyo Soo Lee³; Jin Kyu Lee⁴; ¹Sejong University; ²Samsung Electronics; ³KITECH; ⁴Kongju Nat University

5:15 PM

Temperature-Dependent Microstructures in the Al(x)CoCrCuFeNi Alloys: Louis Santodonato¹; ¹ORNL and UT

High-Temperature Systems for Energy Conversion and Storage — Innovation in Energy Conversion and Storage I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee *Program Organizers:* Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Kyle Brinkman, Clemson University; Paul Ohodnicki, National Energy Technology Laboratory; Amit Shyam, Oak Ridge National

Laboratory; Jung Pyung Choi, Pacific Northwest National Laboratory

Wednesday PM	Room: Grand Harbor Salon 1
March 18, 2015	Location: Yacht & Beach

Session Chairs: Soumendra Basu, Boston University; Jung Choi, Pacific Northwest National Laboratory

2:00 PM Introductory Comments

2:10 PM Invited

Gas Separation Technology Development for Severe Service Environments: *Bryan Morreale*¹; ¹US Department of Energy, National Energy Technology Laboratory

2:45 PM

Metal Oxide Based Thin Films for High Temperature Optical Sensing Applications: Paul Ohodnicki¹; ¹National Energy Technology Laboratory

3:10 PM

Multiphase Composite Ceramic Membranes for Gas Separation: *Kyle Brinkman*¹; Frank Chen²; Wilson Chiu³; ¹Clemson University; ²University of South Carolina; ³University of Connecticut

3:35 PM Break

3:55 PM

Lead Bismuth Eutectic for High-Temperature Thermal Solar Applications: *David Frazer*¹; Miroslav Popovic¹; Cristian Cionea¹; Manuel Abad¹; David Olmsted¹; Yerbol Aussat¹; Alan Bolind¹; Mark Asta¹; Peter Hosemann¹; ¹University of California, Berkeley

4:20 PM Invited

Thermoelectric Study of the Argyrodite Ag8GeTe6 Mixed Electronic Ionic Conductor: the Interplay between the Electron, Ion and Phonon Flow: *Jian He*¹; Dale Hitchcock¹; Menghan Zhou¹; Yufei Liu¹; ¹Clemson University

4:55 PM

Degradation of Sm2zr2O7 Thermal Barrier Coating Caused by Calcium-Magnesium-Aluminum-Silicon Oxide (CMAS) Deposition: *Honglong Wang*¹; Zhizhi Sheng¹; Emily Tarwater¹; Xingxing Zhang¹; Sudip Dasgupta¹; Jeffrey Fergus¹; ¹Auburn University

Integrative Materials Design II: Performance and Sustainability — Role of ICME in Design and Manufacturing

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Materials and Society Committee

Program Organizers: Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Labs; Michael Sangid, Purdue University; Weizhou Li, Caterpillar Inc

Wednesday PM	Room: Grand Harbor Salon 8
March 18, 2015	Location: Yacht & Beach

Session Chairs: Brad Boyce, Sandia National Laboratories; Michael Sangid, Purdue University

2:00 PM Invited

Incorporating Microstructural Models in the Design of Nanocrystalline Metals: *Elizabeth Holm*¹; Philip Goins¹; Brian DeCost¹; Jonathan Humberson¹; Taichong Ma¹; ¹Carnegie Mellon University

2:25 PM Invited

Integration of ICME with Manufacturing Processes for Enhancement of Local Properties in Titanium Alloy Components: Brian Welk¹; John Sosa¹; Daniel Huber¹; Gopal Viswanathan¹; *Hamish Fraser*¹; ¹The Ohio State University

2:50 PM Invited

Design of Nickel-Base Alloys for High-Temperature Service: *Howard Stone*¹; Nicholas Jones; Bryce Conduit; G. Conduit¹; Paul Mignanelli; Katerina Christofidou; Mark Hardy; ¹University of Cambridge

3:15 PM Invited

Design of Self-sensing Alloys and Integration into the Digital Twin Concept: William Leser; *Jacob Hochhalter*¹; John Newman; James Warner²; Patrick Leser²; ¹NASA LaRC; ²NASA Langley Research Center

3:40 PM Break

4:00 PM Invited

Quantifying the Relationship between Microstructure and Springback in Steel Sheet: *Mark Stoudt*¹; Lyle Levine¹; Louis Hector²; Li Ma¹; ¹National Institute of Standards and Technology; ²General Motors R&D Center

4:25 PM Invited

Microstructure-Scale Characterization and Simulation of Metal Deformation: *Corbett Battaile*¹; Brad Boyce¹; Jay Carroll¹; Hojun Lim¹; ¹Sandia National Laboratories

4:50 PM Invited

Insights into Multiscale Deformation Phenomena from In Situ TEM Nanomechnical Testing: Andrew Minor¹; ¹University of California Berkeley & LBL

5:15 PM Invited

A Stochastic Crystal Plasticity Framework for Deformation of Micro-Scale Polycrystalline Materials: *Hesam Askari*¹; Michael Maughan²; Niaz Abdolrahim¹; Dinakar Sagapuram²; David Bahr²; Hussein Zbib³; ¹Massachusetts Institute of Technology; ²Purdue University; ³Washington State University

Magnesium Technology 2015 — Casting and Metal Matrix Composites

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: Michele Manuel, University of Florida; Martyn Alderman, Magnesium Elektron; Alok Singh, National Institute for Materials Science; Neale Neelameggham, Ind LLC

Wednesday PMRoom: Northern Hemisphere E2March 18, 2015Location: Dolphin

Session Chairs: Lei Zhang, University of Alaska, Fairbanks; Wim Sillekens, European Space Agency

2:00 PM

Process-Structure-Property Correlations for HPDC AM60B: *Pouya Sharifi*¹; Ying Fan²; Kumar Sadayappan³; Gabriel Birsan³; Jeff Wood²; ¹Western Ontario University; ²Western Ontario University; ³Canmet Material

2:20 PM

Influence of Alloy Composition on Cast Cracking and Heat Resistance of Mg-Al-Ca Cast Alloy: *Hajime Kato*¹; Hiroyuki Kawabata¹; Shuji Inoue²; Masaaki Kondo³; ¹Toyota Central R&D Labs., Inc.; ²Aishin Seiki Co., Ltd.; ³Toyota Motor Corporation

2:40 PM

Microstructural Scale Effects on Thermal Expansion Behaviour of Cast AZ91D: Hoda Dini¹; Nils-Eric Andersson¹; Ehsan Ghassemali¹; Anders Jarfors¹; ¹Jönköping University, School of Engineering

3:00 PM

Precipitation Sequence in a Mg-Sm-Zn-Zr Alloy: *Xiangyu Xia*¹; Amirreza Sanaty-Zadeh¹; Ran Chen²; Xiaoqin Zeng²; Alan A Luo³; Donald Stone¹; ¹Department of Materials Science and Engineering, University of Wisconsin Madison; ²Department of Materials Science and Engineering, Shanghai Jiaotong University; ³Department of Materials Science and Engineering, Ohio State University

3:20 PM Break

3:40 PM

The ExoMet Project: EU/ESA Research on High-Performance Light-Metal Alloys and Nanocomposites: Wim Sillekens¹; ¹European Space Agency

4:00 PM

High Performance Mg6Zn Nanocomposites Fabricated Through Semi-Solid Mixing and Friction Stir Processing: *Jiaquan Xu*¹; Chezheng Cao²; Shamiparna Das³; Lianyi Chen²; Rajiv Mishra³; Xiaochun Li²; ¹University of Wisconsin-Madison; ²University of California, Los Angeles; ³University of North Texas

4:20 PM

Synthesis and Characterization of Novel Magnesium Materials Containing Copper-Titanium Based (Cu50Ti50) Amorphous Alloy Particles: Sankaranarayanan Seetharaman¹; Nitesh Agrawal²; Jayalakshmi Subramanian¹; Quy Bau Nguyen¹; Manoj Gupta¹; ¹National University of Singapore, Singapore; ²National Institute of Technology Rourkela

4:40 PM

Phase Evaluation of Sr and CaO Added Mg-Al-Si Alloys: Young-Gil Jung¹; Young-Ok Yoon¹; Shae K. Kim¹; Hyunkyu Lim¹; Do Hyang Kim²; ¹KITECH; ²Dept. of Materials Science & Engineering, Yonsei University

5:00 PM

Improving the Corrosion Resistance of Biodegradable Magnesium Alloys by Diffusion Coating Process: *Galit Katarivas Levy*¹; Eli Aghion¹; ¹Ben-Gurion University of the Negev Israel

Magnesium Technology 2015 — Corrosion, Coatings, Fatigue, and Fracture

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: Michele Manuel, University of Florida; Martyn Alderman, Magnesium Elektron; Alok Singh, National Institute for Materials Science; Neale Neelameggham, Ind LLC

Wednesday PM March 18, 2015 Room: Northern Hemisphere E1 Location: Dolphin

Session Chairs: Brian Jordon, University of Alabama; Syamala Pulugurtha, Medtronic

2:00 PM

Fatigue and Corrosion Fatigue of Cold-Drawn WE43 Wires: Adam Griebel¹; Jeremy Schaffer¹; ¹Fort Wayne Metals

2:20 PM

Deformation and Failure Modes of Rapidly Solidified, Ultra-fine Grain, AMX602 and ZAXE1711 Magnesium Alloys: John Chinella¹; ¹U.S. Army Research Laboratory

2:40 PM

Stress Corrosion Cracking of ZEK100 Magnesium Alloy for Automotive Applications: Xin Pang¹; Chao Shi¹; Renata Zavadil¹; ¹CanmetMATERIALS

3:00 PM

Effect of Sn:Zn Ratio on Corrosion Behavior of Mg-aSn-bZn Extrusions: Chang Dong Yim¹; Sang Kyu Woo²; Bong Sun You¹; ¹Korea Institute of Materials Science; ²University of Science and Technology

3:20 PM

Effect of Ca and Y on Corrosion Behavior of Extruded AZ Series Mg Alloys: *Sang Kyu Woo*¹; Chang Dong Yim²; Young Min Kim²; Bong Sun You²; ¹University of Science and Technology; ²Korea Institute of Materials Science

3:40 PM Break

4:00 PM

Characterization of Coatings on Steel Self-Piercing Rivets for Use with Magnesium Alloys: *Robert C. McCune*¹; Joy Forsmark²; Dante Battocchi³; Vinod Upadhyay³; ¹Robert C McCune & Associates LLC; ²Ford Motor Company; ³North Dakota State University

4:20 PM

Investigation of Coating and Corrosion Mitigation Strategies in Magnesium/Mixed Metal Assemblies: *Joy Forsmark*¹; Robert McCune²; Terrence Giles³; Michelle Audette³; Jasmine Snowden³; Jeffrey Stalker⁴; Matthew Morey⁵; Matt O'Keefe⁶; Carlos Castano⁶; ¹Ford Motor Company; ²Robert C. McCune and Associates, LLC; ³Henkel Adhesive Technologies; ⁴PPG Industries, Inc.; ⁵Atotech USA, Inc.; ⁶Missouri S&T

4:40 PM

Influence Of Pulse Time On The Structural And Tribological Properties Of Micro Arc Oxidized AZ91D Magnesium Alloy: Deniz Kilic¹; Faiz Muhaffel¹; Yakup Yurekturk¹; Murat Baydogan¹; ¹Istanbul Technical University

5:00 PM

Electroless Ni-P/NANO-SiO2 Composite Plating on Dual Phase Magnesium-Lithium Alloy: Yun Zou¹; *Zhongwu Zhang*¹; Milin Zhang¹; ¹Harbin Engineering University

Magnetic Materials for Energy Applications V — Soft Magnetic Materials II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Magnetic Materials Committee

Program Organizers: Francis Johnson, GE Global Research; Raju Ramanujan, Nanyang Technological University; Paul Ohodnicki, National Energy Technology Laboratory

Wednesday PM	Room: Grand Harbor Salon 7
March 18, 2015	Location: Yacht & Beach

Session Chairs: Thomas G. Woodcock, IFW Dresden; Orlando Rios, Oak Ridge National Laboratory

2:00 PM Invited

Soft Magnetic Materials for MHz Power Conversion: A Critical Unmet Need for Energy Applications: *Charles Sullivan*¹; ¹Thayer School of Engineering at Dartmouth

2:30 PM

WEDNESDAY PM

Integration of Soft Magnetic Thin Films into On-Chip Inductors for Efficient Power Conversion in Circuits Applications: *Hongbin Yu*¹; Hao Wu¹; Donald Gardner²; ¹Arizona State University; ²Intel Corporation

2:50 PM

Highly Efficient Inductor Cores with High Permeability and Low Core Loss at >1MHz: *Vincent Harris*¹; Parisa Andalib¹; Yajie Chen¹; ¹Northeastern University

3:10 PM

Effect of Sintering Temperature on Magnetic Core-loss Properties of a NiCuZn Ferrite for High-Frequency Power Converters: Yi Yan¹; Guo Quan Lu¹; Khai Ngo¹; Dongbin Hou¹; Mingkai Mu¹; ¹Virginia Tech

3:30 PM Break

3:45 PM

 Tunable Permeability Gapless Inductors for Medium Frequency

 Applications:
 Alex Leary¹;
 Vladimir Keylin¹;
 Paul Ohodnicki²;
 Michael

 McHenry¹;
 ¹Carnegie Mellon University;
 ²National Energy Technology
 Laboratory

4:05 PM

Soft Magnetic Amorphous and Nanocrystalline Bilayer Ribbons: Effects of Thermal Processing In Magnetic Field: *Ivan Skorvanek*¹; Jozef Marcin¹; Marek Capik¹; Igor Matko²; Peter Svec²; ¹Institute of Experimental Physics; ²Institute of Physics

4:25 PM

Atomic Scale Analysis of Rapid Stress Annealing Induced Soft Magnetic Fe-Si Nanocrystallization with Strong Creep Induced Anisotropy: Pradeep Konda Gokuldoss¹; ¹Materials Chemistry, RWTH Aachen University, Germany

4:45 PM

Study of Residual Stresses Induced Due To Manufacturing in Core Laminations Used In Motor Applications: *Aroba Saleem*¹; Dina Goldbaum¹; Aniruddha Chatterjee¹; Richard Chromik¹; David Lowther¹; ¹McGill University

5:05 PM Invited

Magnetostriction of Co-Fe-Based Amorphous Soft Magnetic Microwires: Arcady Zhukov¹; Margarita Churyukanova²; Sergey Kaloshkin²; Viktoria Sudarchikova²; Sergey Gudoshnikov²; Mihail Ipatov³; Ahmed Talaat³; Juan Blanco³; Valentina Zhukova³; ¹Basque Country University and Ikerbasque; ²National University of Science and Technology «MISIS»; ³Basque Country University UPV/EHU

Materials and Fuels for the Current and Advanced Nuclear Reactors IV — General

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory

Wednesday PM March 18, 2015 Room: Grand Harbor Salon 2 Location: Yacht & Beach

Session Chairs: Walter Luscher, Pacific Northwest National Laboratory; Clarissa Yablinsky, Los Alamos National Laboratory

2:00 PM

Assessing and Modelling the Performance of Waste Forms and Container Metals for Long-Term Disposal: *Tae Ahn*¹; ¹U.S. Nuclear Regulatory Commission

2:20 PM

Apatite-Based Ceramic Waste Forms by High Energy Ball Milling and Spark Plasma Sintering for Iodine Confinement: *Jie Lian*¹; Tiankai Yao¹; ¹Rensselaer Polytechnic Institute

2:40 PM

Gradation of Gamma Lithium Aluminate under Simulated Storage Conditions: *Walter Luscher*¹; Larry Bagaasen¹; Brad Johnson¹; Monte Elmore¹; ¹Pacific Northwest National Laboratory

3:00 PM

In Situ Study of Defect Migration Kinetics in Nanoporous Ag with Enhanced Radiation Tolerance: C. Sun¹; M. Kirk²; S. Maloy¹; X. Zhang³; ¹Los Alamos National Laboratory; ²Argonne National Laboratory; ³Texas A&M University

3:20 PM

Density Functional Theory Study on the Behavior of Vanadium Carbide as a Diffusion Barrier within the Fuel/Cladding System of a Fast Reactor: *Brian Demaske*¹; Aleksandr Chernatynskiy¹; Yong Yang¹; Simon Phillpot¹; ¹University of Florida

3:40 PM Break

4:00 PM

Computational Study of Energetics and Defect-Ordering Tendencies for Rare Earth Elements in Uranium Dioxide: *Jonathan Solomon*¹; Alexandra Navrotsky²; Mark Asta¹; ¹University of California, Berkeley; ²University of California, Davis

4:20 PM

Magnetic Nanosorbents for Recycling Spent Nuclear Fuel: *Huijin Zhang*¹; Leigh Martin²; Yaqiao Wu³; You Qiang¹; ¹University of Idaho; ²Idaho National Laboratory; ³Boise State University

4:40 PM

Alpha Decay-Induced Helium and Defect Accumulation in Ceramic Nuclear Waste Forms: *Caitlin Taylor*¹; Maulik Patel¹; Yanwen Zhang¹; Ke Jin¹; Yongqiang Wang²; William Weber¹; ¹The University of Tennessee, Knoxville; ²Los Alamos National Laboratory

5:00 PM

Residual Stresses in Zirconium: Role of Plastic Deformation and Stress Relief: *Gulshan Kumar*¹; Ramesh Singh¹; Jaiveer Singh; D. Srivastava²; G. Dey²; Indradev Samajdar; ¹Indian Institute of Technology Bombay; ²Bhabha Atomic Research Center

Materials and Fuels for the Current and Advanced Nuclear Reactors IV — Structural Materials III

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory

Wednesday PMRoom: Grand Harbor Salon 6March 18, 2015Location: Yacht & Beach

Session Chair: Stuart Maloy, Los Alamos National Laboratory

2:00 PM

The Role of Stress-State on the Deformation and Fracture Mechanism of Hydride and Non-Hydrided Zircaloy-4: *Brian Cockeram*¹; J. Hollenbeck¹; ¹Bechtel-Bettis

2:20 PM

Characterization of Delta Hydride Precipitates in Pure Zr and Zr-4: *Mark Carroll*¹; Laura Carroll¹; David Swank¹; Delon Haggard¹; Michael Tonks¹; ¹Idaho National Laboratory

2:40 PM

Evaluation of the Biaxial Thermal Creep of Hydrided Zircaloy-4 Cladding for Interim Dry Storage of Spent Nuclear Fuel: *Kuan-Che Lan*¹; Yinbin Miao¹; Xiang Liu¹; Kun Mo¹; Hsiao-Ming Tung¹; James Stubbins¹; ¹University of Illinois at Urbana-Champaign

3:00 PM

Solute Distributions in Oxide and Sub-Oxide Layers during Corrosion of Zirconium Alloys: Yan Dong¹; Arthur Motta²; Emmanuelle Marquis¹; ¹University of Michigan; ²Pennsylvania State University

3:20 PM

Investigating the Effect of Oxide Texture on Corrosion Performance and Hydrogen Pickup in Zirconium Alloys: *Alistair Garner*¹; Michael Preuss¹; Philipp Frankel¹; ¹University of Manchester

3:40 PM Break

4:00 PM

The Effect of Applied Stress on C-Component Dislocation Loops in Zr-Based Alloys: *Nesrine Gharbi*¹; R.M. Hengstler-Eger²; X. Feaugas³; D. Gilbon¹; P.B Hoffmann²; M.A Kirk⁴; J.P Mardon⁵; F. Onimus¹; ¹CEA; ²AREVA GmbH; ³LaSIE/Université de La Rochelle; ⁴Argonne National Laboratory; ⁵AREVA NP

4:20 PM

Mitigation of Oxidation of LWR Zircaloy Cladding in High Temperature Steam via FeCrAl Coatings and Chromium Oxide Buffer Layers: Weicheng Zhong¹; Peter Mouche¹; Brent Heuser¹; ¹University of Illinois

4:40 PM

Sample Environment for In Situ Corrosion Studies of Zirconium and Advanced Steel Cladding Alloys in Extreme Environments: Mohamed Elbakhshwan¹; *Simerjeet Gill*¹; Arthur Motta²; Randy Weidner¹; Thomas Anderson¹; Lynne Ecker¹; ¹Department of Nuclear Science and Technology, Brookhaven National Laboratory; ²Department of Mechanical and Nuclear Engineering, The Pennsylvania State University

5:00 PM

Oxidation of Zircaloy-4 in Simulated PWR Environments during In-Situ Proton Corrosion-Irradiation: *Peng Wang*¹; Gary Was¹; Stephen Raiman¹; ¹University of Michigan

Messaging Research to a Broad Audience — Session II

Program Organizers: Kevin Chaput, Purdue University; Andrew Kustas, Purdue University; Kathlene Reeve, Purdue University; Lisa Rueschhoff, Purdue University

Wednesday PM March 18, 2015 Room: Oceanic 1 Location: Dolphin

Session Chairs: Kevin Chaput, Purdue University; Lisa Rueschhoff, Purdue University; Kathlene Reeve, Purdue University; Andrew Kustas, Purdue University

2:00 PM Invited

Four-Color Communications: Effective Relaying of MSE Concepts via Comic Book Art and Film: Suveen Mathaudhu¹; ¹University of California Riverside

2:40 PM

Research as Art – Conveying the Beauty, Complexity, and Human Aspect of Materials Research: *Richard Johnston*¹; Louise Cleobury¹; Rhian Morris¹; ¹Swansea University

3:00 PM Invited

Using Blacksmithing as the Foundation of Curricular, Research, and Outreach Activities: *Michael West*¹; Jon Kellar¹; Dana Medlin²; William Cross¹; Grant Crawford¹; ¹South Dakota School of Mines and Technology; ²Engineering Services, Inc.

3:30 PM Break

3:50 PM

Translating Research into Science Classrooms in the NSF GK-12 Program: *Emma White*¹; Stephanie Zywicki²; Adah Leshem²; ¹Ames Laboratory; ²Iowa State University

4:10 PM

On Helical Origami Structures: *Zi Chen*¹; Eric Dai¹; Huang Zheng²; ¹Washington University; ²Fujian Radio and Television University

4:30 PM Panel Discussion

Microstructural Processes in Irradiated Materials — Fusion Materials (Tungsten and other Alloys)

Sponsored by: TMS: Nuclear Materials Committee Program Organizers: Dane Morgan, University of Wisconsin -Madison; Thak Sang Byun, Oak Ridge National Laboratory; Yasuyoshi Nagai, Tohoku University; Zhijie Jiao, University of Michigan; Kai Nordlund, University of Helsinki; Ming-Jie Zheng, University of Wisconsin

Wednesday PM March 18, 2015 Room: Asia 1 Location: Dolphin

Funding support provided by: Idaho National Laboratory and Oak Ridge National Laboratory

Session Chairs: Brian Wirth, University of Tennessee; Akira Hasegawa, Tohoku University

2:00 PM Invited

Neutron Irradiation Effects on Microstructural Development of Tungsten and Tungsten Alloys: *Akira Hasegawa*¹; Makoto Fukuda¹; Kiyohiro Yabuuchi¹; Shuhei Nogami¹; ¹Tohoku University

2:30 PM Invited

Direct Observation and Interpretation of Helium Implantation Effect on Microstructure and physical Properties of Plasma-Facing Fusion Materials: *Felix Hofmann*¹; Duc Nguyen-Manh²; Christian Beck¹; Alexei Maznev³; Jeffrey Eliason³; David Armstrong¹; W Liu¹; Mark Gilbert²; K Nelson³; Sergei Dudarev²; ¹University of Oxford; ²UK Atomic Energy Authority; ³Massachusetts Institute of Technology

3:00 PM

Modeling Radiation Damage in Bulk Tungsten under Fusion Conditions: Wahyu Setyawan¹; Giridhar Nandipati¹; Kenneth Roche¹; *Richard Kurtz*¹; Brian Wirth²; ¹Pacific Northwest National Laboratory; ²University of Tennessee, Knoxville

3:15 PM

Effect of Sinks for Point Defects on Radiation Hardening in Tungsten-Rhenium Alloys: *David Armstrong*¹; Alan Xu¹; Paul Bagot¹; T.Ben Britton²; ¹University of Oxford; ²Imperial College

3:30 PM Break

3:45 PM

Initiation of Nanostructure Formation on Tungsten Irradiated with 30 keV Helium Ions: Lauren Garrison¹; Gerald Kulcinski²; ¹Oak Ridge National Lab; ²University of Wisconsin-Madison

4:00 PM

Anomalous Defect Evolution in Irradiated UHP Tungsten: In Situ TEM Observations and Interpretation: *Daniel Mason*¹; Xiaoou Yi²; Mark Kirk³; Sergei Dudarev¹; ¹Culham Centre for Fusion Energy; ²Department of Materials, Oxford University; ³Materials Science Division, Argonne National Laboratory

4:15 PM

Heavy Ion Irradiation on Ultrafine-and Nanocrystalline-Grained Tungsten: Effect of 3 MeV Si, Cu and W Ions: Osman El-Atwani¹; Anastassiya Suslova¹; Theodore Nivakowski¹; Khalid Hattar²; Mert Efe¹; Sivanandan Harilal¹; Ahmed Hassanein¹; ¹Purdue University; ²Sandia National Laboratory

4:30 PM

First-Principles Calculations of Intrinsic and Extrinsic

Defects in Dilute W Alloys: *Leili Gharaee*¹; Paul Erhart¹; ¹Chalmers University

4:45 PM

Migration Behavior of Rhenium and Osmium in Tungsten: First Principles Study: *Tomoaki Suzudo*¹; Akira Hasegawa²; ¹Japan Atomic Energy Agency; ²Tohoku University

5:00 PM

Measuring and Modeling Defect Formation and Kinetics in Ion Irradiated Mo at 30 K and 300 C in the Recently Reopened IVEM-Tandem Facility: *Marquis Kirk*¹; Meimei Li¹; Donghua Xu²; Brian Wirth²; ¹Argonne National Laboratory; ²University of Tennessee

5:15 PM

Experimental Approach to Determine the Barrier Strength Factor for Mobile Dislocation against Void and He Bubble in ion-Irradiated Mo: *Uchu Kawase*¹; Ken-ichi Fukumoto¹; Takashi Onitsuka¹; Kimihiro Nogiwa¹; ¹Univ. of Fukui

Multiscale Microstructure, Mechanics and Prognosis of High Temperature Alloys — General

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: High Temperature Alloys Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers*: Mark Tschopp, Army Research Laboratory; Jeffrey Evans, University of Alabama in Huntsville; Jonathan Cormier, ENSMA / Institut Pprime - UPR CNRS 3346; Qiang Feng, University of Science and Technology Beijing

Wednesday PM	Room: Europe 1
March 18, 2015	Location: Dolphin

Session Chairs: Mark Tschopp, US Army Research Laboratory; Jonathan Cormier, ISAE-ENSMA & Institut Pprime

2:00 PM Invited

Contribution of Nano Twins and Precipitates to the Creep Behavior in Advanced Austenitic Stainless Steel: *Guocai Chai*¹; ¹Sandvik Materials Technology

2:20 PM

Self-Healing of Creep Damage in Fe-Au Alloys at High Temperatures: *Shasha Zhang*¹; Niels van Dijk¹; Ekkes Bruck¹; Sybrand van der Zwaag¹; ¹TU Delft

2:40 PM

Modelling Creep Type IV Fracture in High Chromium Steel Welds: Nicola Bonora¹; *Luca Esposito*²; Simone Dichiaro¹; ¹University of Cassino; ²PALMER Sci & Tech Park Southern Lazio

3:00 PM

In Situ Study of Phase Transformations of a TiAl Alloy during Laser-Beam Welding: *Jie Liu*¹; Peter Staron¹; Stefan Riekehr¹; Andreas Stark¹; Norbert Schell¹; Norbert Huber¹; Andreas Schreyer¹; Martin Müller¹; Nikolai Kashaev¹; ¹Helmholtz-Zentrum Geesthacht, Germany

3:20 PM Break

3:40 PM

Coupling between Re Segregation and γ/γ' Interfacial Dislocations during High-Temperature and Low-Stress Creep of a Nickel-Based Single Crystal Superalloy: *Ming Huang*¹; Zhiying Cheng¹; Jichun Xiong²; Jiarong Li²; Jianqiao Hu¹; Zhanli Liu¹; Jing Zhu¹; ¹Tsinghua University; ²Beijing Institute of Aeronautical Materials

4:00 PM

Ab Initio Study of the Effect of Solute Atoms on Vacancy Diffusion in Ni-Based Superalloys: *Kamal Goswami*¹; Alessandro Mottura¹; Sergej Schuwalow²; Jutta Rogal²; Ralf Drautz²; ¹University of Birmingham; ²Ruhr-Universität Bochum

4:20 PM

An Efficient Hybrid 2D/3D Thin Film Dislocation Model: Siavash Sarrafan¹; Ray Fertig¹; ¹University of Wyoming

Multiscale Microstructure, Mechanics and Prognosis of High Temperature Alloys — Microstructure, Durability, and Other High Temperature Materials/ Applications

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: High Temperature Alloys Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Mark Tschopp, Army Research Laboratory; Jeffrey Evans, University of Alabama in Huntsville; Jonathan Cormier, ENSMA / Institut Pprime - UPR CNRS 3346; Qiang Feng, University of Science and Technology Beijing

Wednesday PM	Room: Oceanic 7
March 18, 2015	Location: Dolphin

Session Chairs: Mark Tschopp, Army Research Laboratory; Jonathan Cormier, ISAE-ENSMA & Institut Pprime; Qiang Feng, University of Science and Technology Beijing

2:00 PM Invited

The Effect of Local Texture and Plastic Strain Distribution on the Deformation Micromechanism in RR1000 Nickel-Based Superalloy: Soran Birosca¹; Mark Hardy²; ¹Swansea University ; ²Rolls-Royce plc

2:20 PM

Effect of Bi-Crystal Grain Boundary Angle on Stress Rupture Life of a Nickel-Based Superalloy: Xiangbin Meng¹; Qi Lu²; *Jinguo Li*¹; ¹Institute of Metal Research; ²Delft University of Technology

2:40 PM

Experimental Investigation on Plastic Strain and Recrystallization of Single Crystal Nickel Based Superalloy: Zhonglin Li¹; Qingyan Xu¹; Baicheng Liu¹; ¹Tsinghua University

3:00 PM Invited

Recrystallization in Directionally Solidified Ni Based Superalloys: *Jian Zhang*¹; Guang Xie¹; Li Wang¹; ¹Institute of Metal Research, Chinese Academy of Sciences

3:20 PM

The Effects of Local Microstructure on Deformation Mechanism in IN713C Alloy: Mark Coleman¹; Soran Birosca¹; ¹Swansea University

3:40 PM Break

4:00 PM

Microstructure Evolution during Al, Ti and Mo Surface Deposition and Volume Diffusion in Ni-20Cr Wires: Cong Wang¹; David Dunand¹; ¹Northwestern University

4:20 PM Invited

Revealing the Role of Ternary Additions in High Temperature Shape Memory Phase and Microstructural Stability: Gregory Thompson¹; Suzanne Kornegay¹; B. Hornbuckle¹; Monica Kapoor¹; Anne Coppa¹; Glen Bigelow²; Ronald Noebe²; Mark Weaver¹; ¹University of Alabama; ²NASA Glenn Research Center

4:40 PM

Transient Liquid Phase Bonded Ni-Based Woven Superalloys: *Dinc Erdeniz*¹; Keith Sharp²; David Dunand¹; ¹Northwestern University; ²Saertex, LLC

5:00 PM

Microstructural Evolution and Mechanical Behaviour of Ni Based Superalloy under High Temperature Deformation: Maribel De la Garza Garza¹; Adriana García¹; Victor Paramo²; ¹FIME, UANL; ²FRISA FORJADOS S.A. de C.V.

Nano- and Micro-Mechanical Measurements in Harsh Environments — In-Situ Testing at Non-Ambient Conditions

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee *Program Organizers:* Peter Hosemann, University of California Berkeley; Jeffrey Wheeler, EMPA; Verena Maier, Erich Schmidt Institut; Douglas Stauffer, Hysitron

Wednesday PM March 18, 2015 Room: Oceanic 4 Location: Dolphin

Session Chair: Verena Maier, Austrian Academy of Science

2:00 PM Invited

Cryogenic In Situ Mechanical Testing of Sn Alloys: A. Lupinacci¹; J. Kacher¹; A. Eilenberg²; A. Shapiro³; Peter Hosemann²; *Andrew Minor*¹; ¹University of California Berkeley & LBL; ²University of California Berkeley; ³JPL

2:40 PM

Deformation of Diamond and Silicon at High Pressures and Temperatures: *Jeffrey Wheeler*¹; Rejin Raghavan²; Johann Michler¹; ¹EMPA - Materials Science & Technology; ²MPIE - Max Planck Institute for Iron Research

3:00 PM

In Situ TEM Investigation of the Effects of Hydrogen on the Behavior of Dislocation and Cracking in Aluminum: *Degang Xie*¹; Suzhi Li²; Zhangjie Wang¹; Peter Gumbsch²; Ju Li³; Zhiwei Shan¹; ¹State Key Laboratory for Mechanical Behavior of Materials; ²Karlsruhe Institute of Technology; ³Massachusetts Institute of Technology

3:20 PM Break

3:40 PM

New Testing and Analysis Strategies for In Situ High Temperature Nanomechanical Testing: *Warren Oliver*¹; Richard Anthony¹; Sudharshan Phani Pardhasaradhi¹; Bryan Crawford¹; ¹Nanomechanics Inc

4:00 PM

Understanding Erosion Performance of Nanocellular Metal Filled Polymer Composites Using Nano-Indentation: *Michael Birnkrant*¹; Joseph Bonivel¹; Robert Barth¹; Wei-Na Li¹; ¹United Technologies Research Center

4:20 PM

Deformation Induced Ultrahigh Lattice Rotation through Phase Transitions in Body-Centered Cubic Metals: Shujuan Wang¹; *Kui Du*¹; Hao Wang²; Wei Zhang¹; Manling Sui³; Scott Mao⁴; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences; ²Institute of Metal Research, Chinese Academy of Sciences; ³Beijing University of Technology; ⁴University of Pittsburgh

4:40 PM

Expanding the Range of Strain Rate Testing with Nanoindetation: *Sudharshan Phani Pardhasaradhi*¹; Bryan Crawford¹; Warren Oliver¹; ¹Nanomechanics Inc.

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Nanocomposites III — Metal Nanocomposites II

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Muralidharan Paramsothy, National University of Singapore, NanoWorld Innovations (NWI); Meisha Shofner, Georgia Institute of Technology; Changsoo Kim, University of Wisconsin-Milwaukee

Wednesday PMRoom: Europe 2March 18, 2015Location: Dolphin

Session Chair: Daneesh Simien, University of Alabama at Birmingham

2:00 PM Invited

Morphological Evolution of Metallic Nanoparticles and the Formation of Core-Shell Structures: A Phase Field Treatment: *Fadi Abdeljawad*¹; Michael Chandross¹; ¹Sandia National Laboratories

2:40 PM Invited

In-Situ TiB2 Reinforced Aluminum Matrix Nanocomposites: Afsaneh Dorri Moghadam¹; J.B. Ferguson; Pradeep Rohatgi; ¹University of Wisconsin-Milwaukee

3:20 PM Break

3:40 PM

The Al-RE-(TM) Nanocrystal/Amorphous Nanocomposites: *Mustafacan Kutsal*¹; Eren Kalay¹; ¹METU

4:00 PM

Strengthening Efficiency of Al-Based Composites Reinforced with Carbon Nanotubes and Graphene: Seeun Shin¹; Donghyun Bae¹; ¹Yonsei University

4:20 PM

Dislocation Structure of Cu/Nu (100) Semi-Coherent Interface and Its Role in Lattice Dislocation Nucleation: *Firas Akasheh*¹; Mohammad R. Karim¹; Shuai Shao²; ¹Tuskegee University; ²Los Alamos National Laboratory

4:40 PM

Optimum Sintering Conditions for Production of Fully Dense Al-Al₃Ti Nanocomposite by Mechanical Alloying and Two-Step Hot Pressing: Armin Vahid Mohammadi¹; Hamid Reza Madaah Hosseini²; ¹Florida International University; ²Sharif University of Technology

Nanostructured Materials for Rechargeable Batteries and for Supercapacitors III — Session VII: Advanced Characterization and New Batteries

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee Program Organizers: Reza Shahbazian-Yassar, Michigan

Technological University; Yan Yao, University of Houston; David Mitlin, Clarkson University

Wednesday PM	Room: Europe 3
March 18, 2015	Location: Dolphin

Session Chairs: Jagjit Nanda, Oak Ridge National Laboratory; Yan Yao, University of Houston

2:00 PM Invited

Using Nanomaterials to Control Microstructure and Enhance Performance in Lithium Ion Batteries: Vanessa Wood¹; ¹ETH Zurich

2:25 PM Invited

Quantifying the Chemical and Morphological Heterogeneities in High Capacity Battery Materials Under Electrochemical Cycling: *Jagjit Nanda*¹; Yijin Liu²; Joy Andrews²; Feifei Wang³; Surendra Martha⁴; ¹Oak Ridge National Laboratory; ²Stanford Synchrotron Radiation Lightsource, SLAC National Accelerator Laboratory; ³National Synchrotron Radiation Laboratory, China; ⁴Indian Institute of Technology, Hyderabad

2:50 PM Invited

Stress Evolution and Degradation Mechanisms in the Solid Electrolyte Interphase: *Brian Sheldon*¹; Anton Tokranov¹; Ravi Kumar¹; Xingcheng Xiao²; ¹Brown University; ²General Motors

3:15 PM Invited

Novel Nanostructured Electrode Materials for Lithium-Air Batteries and Sodium-Ion Batteries: *Guoxiu Wang*¹; ¹University of Technology, Sydney

3:40 PM Break

3:55 PM Invited

Advanced Redox Flow Battery Technologies: Wei Wang¹; ¹Pacific Northwest National Laboratory

4:20 PM Invited

Structured Micro-Sized Si-C Composites as Li-Ion Anodes: *Donghai Wang*¹; ¹Penn State University

4:45 PM Invited

Hierarchical Nanohybrids with Porous CNT-Networks Decorated Crumpled Graphene Balls for Supercapacitors: Junhong Chen¹; Shun Mao¹; ¹University of Wisconsin-Milwaukee

5:10 PM Invited

Development of Nanoscale Planar Electrochemical Devices and Applications: *Liangbing Hu*¹; ¹University of Maryland College Park

Nanostructured Materials for Rechargeable Batteries and for Supercapacitors III — Session VI: Advanced Topics in Batteries

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee *Program Organizers*: Reza Shahbazian-Yassar, Michigan Technological University; Yan Yao, University of Houston; David Mitlin, Clarkson University

Wednesday PM March 18, 2015 Room: Europe 5 Location: Dolphin

Session Chairs: Husnu Unalan, Middle East Technical University; Jinhui Peng, Kunming University of Science and Technology; Reza Shahbazian-Yassar, Michigan Technological University

2:00 PM

Textile Based Ternary Nanocomposite Supercapacitors: Recep Yuksel¹; Zeynep Sarioba¹; *Husnu Unalan*¹; ¹Middle East Technical University

2:20 PM

Preparation, Process Optimization and Performance of LiNi1/3Mn1/3Co1/3O2 Coin-Type Lithium Ion Battery: Jiang Du¹; zhengfu Zhang¹; *Jinhui Peng¹*; Jin Cheng¹; Xiaolong Qu¹; Xiaoyan Wang¹; Hongge Yan²; ¹Kunming University of Science and Technology; ²College of Materials Science and Engineering, Hunan University

2:40 PM

Molecular Level Optimization of Polyoxometalates Based Nano-Clusters via Appropriate Organo-Imido Functionalization for their Harnessing as an Efficient Anode Material for Li-Ion Batteries: *Rao Naumaan Nasim Khan*¹; Nasir Mahmood²; Yongge Wei¹; Yanglong Hou²; ¹Tsinghua University; ²Peking University

2:55 PM

Synthesis of Porous Nb₂O₅ Polymorphs as Electrodes for Electrochemical Pseudocapacitors: *Shuang Li*¹; Guozhong Cao²; Qian Xu¹; Evan Uchaker²; ¹Northeastern University; ²University of Washington

3:10 PM

Nanocatalyst-Laden Multi-Walled Carbon Nanotubes as Cathode for Lithium-Air Batteries: *Neha Chawla*¹; Bilal El-Zahab¹; ¹Florida International University

3:25 PM Break

3:55 PM

Organic-Inorganic Hybrid Materials as Novel Solid-State Electrolytes for Li-Ion Batteries: *Meer Safa*¹; Amir Chamaani¹; Bilal El-Zahab¹; ¹Florida International University

4:10 PM

Advances in Nanostructured LiNixMnyCo1-x-yO2 as Cathode Materials for Lithium Ion Batteries: *Jiang Du*¹; Zhengfu Zhang¹; Jinhui Peng¹; Jin Cheng¹; Xiaolong Qu¹; Xiaoyan Wang¹; ¹Kunming University of Science and Technology

4:25 PM

Amorphous Vanadium Oxide for Sodium-Ion Battery: *Evan Uchaker*¹; Guozhong Cao¹; ¹University of Washington

Neutron and X-Ray Studies of Advanced Materials VIII: Diffraction Limit and Beyond — Defects, Strains, Stresses II

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Brent Fultz, California Institute of Technology; Peter Liaw, UTK; Jaimie Tiley, Air Force Research Laboratory

Wednesday PM	Room: Pelican 1
March 18, 2015	Location: Swan

Funding support provided by: Air Force Research Laboratory

Session Chairs: Roger England, Cummins Inc; Jaimie Tiley, Air Force Research Laboratory

2:00 PM Keynote

Structural Evolution of Metals at High Temperature: Complementary Investigations with Neutron and Synchrotron Quantum Beams: *Klaus-Dieter Liss*¹; ¹Australian Nuclear Science and Technology Organisation

2:40 PM

In-Situ Neutron Reflectometry during Thin Film Growth by Sputter Deposition: *Wolfgang Kreuzpaintner*¹; Birgit Wiedemann¹; Sina Mayr¹; Jingfan Ye¹; Andreas Schmehl²; Thomas Mairoser²; Alexander Herrnberger²; Jean-Francois Moulin³; Jochen Stahn⁴; Panagiotis Korelis⁴; Martin Haese-Seiller³; Matthias Pomm³; Amitesh Paul¹; Björgvin Hjörvarsson⁵; Peter Böni¹; Jochen Mannhart⁶; ¹Technische Universität München; ²Zentrum für elektronische Korrelation und Magnetismus, Universität Augsburg; ³Helmholtz-Zentrum Geesthacht Zentrum für Material- und Küstenforschung GmbH; ⁴Paul Scherrer Institut, Laboratory for Neutron Scattering; ⁵Uppsala University; ⁶Max-Planck-Institut für Festkörperforschung

3:00 PM

In-Situ Monitoring of Phase Transformation during Isothermal Holding in a 316Nb Type Steel: *William Jolly*¹; Caroline Toffolon-Masclet¹; Gilles André¹; Bernard Marini¹; François Cortial²; Philippe Petit³; Sylvain Ringeval¹; ¹Commissariat à l'Energie Atomique et aux Energies Alternatives; ²DCNS Research; ³Aubert & Duval

3:20 PM Break

3:40 PM Invited

From Modelling of Plasticity in SX Superalloys to High Resolution X-rays TCD Peaks Simulation: *Alain Jacques*¹; ¹IJL/CNRS, Labex DAMAS

4:10 PM Invited

Complementary Stress Assessment in Nanostructures: From Semiconductors to Metal Alloys: Ralph Spolenak¹; ¹ETH Zurich

4:40 PM Invited

Neutron Diffraction Residual Stress Measurements as Applied in United States Air Force Foundational Engineering Problem Program on ICME of Bulk Residual Stress in Ni-Base Superalloy Rotors: *Iuliana Cernatescu*¹; Vasisht Venkatesh¹; Jamie Glanovsky¹; Ralph Green¹; Daniel Gynther¹; Grant Reinman¹; Alexandru Stoica²; Ke An²; Matthew Frost²; Todd Turner³; ¹Pratt and Whitney; ²Oak Ridge National Laboratory; ³Air Force Research Laboratory

5:10 PM

In Situ High Pressure/High Temperature X-ray Diffraction of WN Phases from Novel Precursors: James Wollmershauser¹; Boris Feigelson¹; Syed Qadri¹; M. Imam²; Daniel Finkenstadt³; Michael Mehl¹; ¹Naval Research Laboratory; ²George Washington University; ³United States Naval Academy

Neutron and X-Ray Studies of Advanced Materials VIII: Diffraction Limit and Beyond — General Session Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Brent Fultz, California Institute of Technology; Peter Liaw, UTK; Jaimie Tiley, Air Force Research Laboratory

Wednesday PM March 18, 2015

Room: Macaw 1 Location: Swan

Funding support provided by: Air Force Research Laboratory

Session Chairs: Feng Ye, SNS; Christina Hoffman, ORNL

2:00 PM Invited

Exploring Reciprocal Space through 3-D Volumetric Mapping: *Christina Hoffmann*¹; ¹Oak Ridge National Laboratory

2:30 PM Invited

SANS Measurements of Hydride Reorientation during Ex Situ Tensile Stress of LWR Cladding: *Brent Heuser*¹; ¹University of Illinois

3:00 PM Invited

Zirconium Hydride Phase Transformation in Zircaloy-4: Correlation to Ductility Changes as a Function of Temperature of Hydrided Zr Alloy Cladding: *Ken Littrell*¹; ¹Oak Ridge National Laboratory

3:30 PM Break

3:40 PM Invited

Dark Field Transmission X-ray Microscopy Studies of 3D Domain Evolution During Plastic Deformation: *Henning Poulsen*¹; Hugh Simons¹; Wolfgang Ludwig²; Wolfgang Pantleon¹; Søren Schmidt¹; Yubin Zhang²; Frederik Stöhr¹; Carsten Detlefs²; ¹DTU; ²ESRF

4:10 PM Invited

Residual Stress Modeling of Castover Aluminum Steel Joints: *Thomas Watkins*¹; Adrian Sabau¹; Gerard Ludtka¹; Donald Erdman¹; Bart Murphy¹; Timothy Skszek²; Xiaoping Niu³; Saptarshi Mitra⁴; Sam Scott⁴; ¹ORNL; ²Magna; ³Promatek Research Centre; ⁴ESI-NA - Casting

4:40 PM

Enabling Diffraction Contrast Tomography in the Laboratory: Arno Merkle¹; Christian Holzner¹; Michael Feser¹; Kevin Fahey¹; *Erik Lauridsen*²; Peter Reischig²; Henning Früs Poulsen²; Leah Lavery¹; ¹Carl Zeiss X-ray Microscopy, Inc.; ²Xnovo Technology

5:00 PM

Application of Energy-Dispersive pnCCD Detector in Material Science Using Hard X-rays: *Ullrich Pietsch*¹; Sebastian Send¹; Ali Abboud¹; Nadja Pashniak¹; Tuba Conka-Nurdan²; Martin Huth³; Dieter Schlosser³; Lothar Strüder³; ¹University of Siegen; ²Türk-Alman Üniversitesi ; ³pnSensor GmbH

5:20 PM

CORELLI: The Elastic Diffuse Scattering Spectrometer at SNS: *Feng Ye*¹; ¹Oak Ridge National Laboratory

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Novel Synthesis and Consolidation of Powder Materials — Microstructure, Property and Applications of Novel PM Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee *Program Organizers*: Ma Qian, RMIT University (Royal Melbourne Institute of Technology); Iver E Anderson, The Ames Laboratory

Wednesday PM March 18, 2015 Room: Swan 10 Location: Swan

Session Chairs: Mingdong Cai, Schlumberger; Huiping Tang, State Key Laboratory of Porous Metal Materials, Northwest Institute for Nonferrous Metal Research (NIN)

2:00 PM

Hot Equal Channel Angular Extrusion (ECAE) of Thermally Stabilized Nanocrystalline Fe-Ni-Zr Alloys Produced by Mechanical Alloying: *Hasan Kotan*¹; Kris Darling²; ¹Dept. Metall. Engr. & Mat. Sci. Necmettin Erbakan University; ²ARL

2:20 PM

Manufacture and Characterization of Porous Ni-Base Alloys for High-Temperature Gas Cleaning: *Wang Jian*¹; Yang Kun¹; Wang Qiangbing¹; Yang Baojun¹; H. P. Tang; ¹Northwest Institute for Nonferrous Metal Research

2:40 PM

Mechanical Damping Behavior of Powder Metallurgy Aluminum and Aluminum-Based Nanocomposites: *Hyunjoo Choi*¹; Jaehyuck Shin²; Kwangmin Choi¹; Serge Shilko³; Donghyun Bae²; ¹Kookmin University; ²Yonsei University; ³V.A. Belyi Metal-Polymer Research Institute, Belarussian Academy of Sciences

3:00 PM Invited

Transformation of Interparticle Boundaries into Grain Boundaries and Interfaces during Thermomechanical Consolidation of Metallic Powders: *Deliang Zhang*¹; Cun Liang¹; Mingtu Jia²; Mingxing Ma¹; ¹Shanghai Jiao Tong University; ²University of Waikato

3:25 PM Break

3:45 PM Keynote

Sintered Metal Fibre Porous Materials and Applications: *H. P. Tang*¹; J. Z. Wang¹; ¹Northwest Institute for Nonferrous Metal Research

4:20 PM Invited

Titanium-metal Oxides Composites through Powder Metallurgy for Orthopaedic Applications: *Yuncang Li*¹; Cuie Wen²; Peter Hodgson¹; ¹Deakin University; ²Swinburne University of Technology

4:45 PM

WEDNESDAY PM

Disintegrable Metal Matrix Composites for Oilfield Applications: *Zhihui Zhang*¹; Bobby Salinas¹; Zhiyue Xu¹; ¹Baker Hughes

5:05 PM Invited

Ni-Based Superalloy Powder Processed Layer for Combustor Airfoils in IGCC Power Plants: *Emma White*¹; Andrew Heidloff¹; Joel Rieken¹; David Byrd¹; Iver Anderson¹; ¹Ames Laboratory

Pb-Free Solders and Emerging Interconnect and Packaging — Electromigration and Thermomigration

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Electronic Packaging and Interconnection Materials Committee *Program Organizers:* John Elmer, LLNL; Yan Li, Intel Corp.; Andre Lee, Michigan State University; Fan-Yi Ouyang, National Tsing Hua University; Srini Chada, Schlumberger; Kyu-Oh Lee, Intel Corp.; Kwang-Lung Lin, National Cheng Kung University; Christopher Gourlay, Imperial College; Daniel Lewis, Rensselaer Polytechnique Institute; Fan Gao, U. Masachusetts Lowell

Wednesday PM	Room: Lark
March 18, 2015	Location: Swar

Session Chairs: Kyu-Oh Lee, Intel Corporation; Fan-Yi Ouyang, National Tsing Hua University

2:00 PM

Electro-Migration Study in First Level Interconnects: *Amaneh Tasooji*¹; Leticia Lara²; Kyu-oh Lee³; ¹Arizona State University; ²Honeywell; ³Intel Corporation

2:25 PM

Heat Flow and Microstructural Evolution Associated with the Use of Self-Propagating Reactive Multilayer Foils on a Tin-Based Alloy Substrate: *Ryan Hooper*¹; David Adams²; Michele Manuel¹; ¹University of Florida; ²Sandia National Laboratories

2:50 PM

Back-Fill Sn Flux Against Current-Stressing at Cathode Micro Cu/ Sn Interface: Yi Chun Hsu¹; Y J Hu¹; K H Yang¹; Cheng Yi Liu¹; ¹National Central University

3:15 PM

The Dissolution and Supersaturation of Zn in the Sn9Zn Solder under Current Stressing: *Ting-Hui Wang*¹; Kwang-Lung Lin¹; ¹Department of Materials Science and Engineering, National Cheng Kung University

3:40 PM Break

3:55 PM

Evolution of Electromigration Damage in Idealized SnAgCu 305 Interconnects: *Xioranny Linares*¹; John Morris¹; ¹University of California Berkeley

4:20 PM

Mechanical Response of Pb-Free Solder Joints after Current Stressing: *Yong Zuo*¹; Limin Ma¹; Fu Guo¹; Yutian Shu¹; Andre Lee²; K. N. Subramanian²; Feng Tai¹; ¹Beijing University of Technology; ²Michigan State University

4:45 PM

Effect of Temperature on Thermomigration of Solder Joints: *Yi-Shan Yang*¹; Tzu-Yang Lin¹; Fan-Yi Ouyang¹; ¹National Tsing Hua University, Taiwan

5:10 PM

Electromigration Failure Mechanism of Cu/SnAg/Ni Microbumps in Three-Dimensional Integral Circuits Using Kelvin Bumps Structure: Wan-Hsuan Lin¹; Chih Chen¹; Chau-Jie Zhan²; Yu-wei Huang²; ¹National Chiao Tung University; ²Assembly and Reliability Department/EOL/ITRI

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIV — Session II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee

Program Organizers: Chao-hong Wang, National Chung Cheng University; Jae-Ho Lee, Hongik University; Clemens Schmetterer, Forschungszentrum Juelich, Inst. For Energy and Climate Research -2; Ikuo Ohnuma, Tohoku University; Shien Ping Feng, The University of Hong Kong; Shih-Kang Lin, National Cheng Kung University; Chih-Ming Chen, National Chung Hsing University; Yee-Wen Yen, National Taiwan University of Science and Technology

Wednesday PM	Room: Parrot
March 18, 2015	Location: Swan

Session Chairs: Ikuo Ohnuma, Tohoku University; Albert T. Wu, National Central University

2:00 PM Invited

Phase Equilibria of Cu-In-Se Ternary System: Wan-ting Chiu¹; Sinn-wen Chen¹; Ssu-ming Tseng¹; ¹National Tsing Hua University

2:30 PM

The Effect of Template Geometry on the Eutectic Growth of Directionally Solidified Binary Organic Metamaterials: A Phase-Field Study: *Ali Ramazani*¹; Vladislava Tomeckova¹; Larry Aagesen¹; Duckhyun Lee¹; John Halloran¹; Katsuyo Thornton¹; ¹University of Michigan

2:50 PM

Interfacial Reaction of Zn-Al Based High Temperature Solders: *Hsien Chien Hsieh*¹; Albert T. Wu¹; ¹National Central University

3:10 PM

Study of Cu-Pd Interdiffusion Bonding: *Kun Hui Yang*¹; Cheng Yi Liu¹; ¹National Central University

3:30 PM Break

3:50 PM

Thermodynamic Investigation of the Perovskite Electrical Conductivity: *Shadi Darvish*¹; Maria Mora¹; Yu Zhong¹; ¹Florida International University

4:10 PM

Phase Diagrams of Pb-Sb-Se Ternary System: *Jui-Shen Chang*¹; Sinn-wen Chen¹; ¹National TsingHua University

4:30 PM

Co-relation between the Surface Microstructure of Surface-Deformed Cu Foils and the Soldering Wettability: *Yi Chun Hsu*¹; Cheng Yi Liu¹; ¹National Central University

4:50 PM

Phase Stability of Sn-Pb, Sn-Cu and Sn-Ag Binary Systems under Current Stressing: Yu-chen Liu¹; Shih-kang Lin¹; ¹National Cheng Kung University

5:10 PM

Effect of Temperature Gradient on the Growth of Ag3Sn Intermetallic Compounds in Pb-Free Solder during Thermo-Compressive Bonding Process: *Hsin-Yuan Chen*¹; Yu-Ping Su¹; Chun-Sen Wu¹; Kuan-Neng Chen¹; Fan-Yi Ouyang¹; ¹National Tsing Hwa University, Taiwan

Phase Transformations and Microstructural Evolution — Shape Memory Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee Program Organizers: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Soumya Nag, University of North Texas; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama; Amy Clarke, Los Alamos National Laboratory; Frederic Danoix, CNRS - Université de Rouen; Emmanuelle Marquis, University of Michigan

Wednesday PM March 18, 2015 Room: Swan 2 Location: Swan

Session Chairs: Peter Anderson, The Ohio State University; Gregory Thompson, University of Alabama

2:00 PM

Crystallographic Origin of Dimensional Instability of Shape Memory Alloys: *Yipeng Gao*¹; Matthew Bowers¹; Ronald Noebe¹; Michael Mills¹; Yunzhi Wang¹; ¹The Ohio State University

2:20 PM Invited

The Interaction between Phase Transformations and Plasticity in Shape Memory Alloys: A Coupled Modeling and Experimental Study: Harshad Paranjape¹; Sivom Manchiraju¹; Matthew Bowers¹; Michael Mills¹; *Peter Anderson*¹; ¹The Ohio State University

2:50 PM

Phase Transformation in Shape Memory Alloys: From the Macro to the Micro Length Scale: Samantha Daly¹; ¹University of Michigan

3:10 PM

Investigation of the R-Phase during Stress- and Temperature-Induced Phase Transformations in NiTi: *Douglas Nicholson*¹; Santo Padula²; Othmane Benafan²; Harley Skorpenske³; Ke An³; Andrew Payzant³; Raj Vaidyanathan¹; ¹University of Central Florida; ²NASA Glenn Research Center; ³Oak Ridge National Laboratory

3:30 PM Break

3:50 PM Invited

Recent Developments in High Temperature Shape Memory Alloys: *Ibrahim Karaman*¹; Ronald Noebe²; ¹Texas A&M University; ²NASA Glenn Research Center

4:20 PM

Two Types of Martensitic Phase Transformations in Magnetic Shape Memory Alloys by In-Situ Nanoindentation Studies: Yue Liu¹; Ibrahim Karaman¹; Haiyan Wang¹; Xinghang Zhang¹; ¹Texas A&M University

4:40 PM

Influence of Zr on the H-Phase Precipitation and Mechanical Attributes in Ni-rich Ni-Ti-Zr Shape Memory Alloys: *Suzanne Kornegay*¹; Monica Kapoor¹; Billy Hornbuckle¹; Glen Bigelow²; Mark Weaver¹; Gregory Thompson¹; ¹The University of Alabama; ²NASA Glenn Research Center

5:00 PM

The Effects of Aging and Precipitation in Ni-Rich Ni-Ti-Hf High Temperature Shape Memory Alloys: *Xiang Chen*¹; Lee Casalena¹; Daniel Coughlin²; Fan Yang¹; Ronald Noebe³; Michael Mills¹; Peter Anderson¹; ¹The Ohio State University; ²Los Alamos National Laboratory; ³NASA Glenn Research Center

5:20 PM

Role of Precipitate Chemistry and Morphology on the Mechanical and Phase Transformation Behavior in a NiTiHfAl Shape Memory Alloy: *Michael Kesler*¹; Amanda Varela²; Oscar Figueroa¹; B. Hornbuckle³; Gregory Thompson³; John Newman⁴; Michele Manuel¹; ¹University of Florida; ²Escola Politécnica of Universidade Federal do Rio de Janeiro; ³University of Alabama; ⁴NASA Langley Research Center WEDNESDAY PM

5:40 PM

Transformation and Deformation Mechanisms in High Temperature Shape Memory Alloys with Nanoprecipitates: *Lee Casalena*¹; Daniel Coughlin²; Fan Yang¹; Xiang Chen¹; Matthew Bowers¹; Harshad Paranjape¹; Yipeng Gao¹; Michael Mills¹; Peter Anderson¹; Yunzhi Wang¹; Ronald Noebe³; Glen Bigelow³; Darrell Gaydosh³; Santo Padula³; ¹The Ohio State University; ²Los Alamos National Laboratory; ³NASA Glenn Research Center

Phase Transformations and Microstructural Evolution — Steels II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Soumya Nag, University of North Texas; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama ; Amy Clarke, Los Alamos National Laboratory; Frederic Danoix, CNRS - Université de Rouen; Emmanuelle Marquis, University of Michigan

Wednesday PM	Room: Swan 3
March 18, 2015	Location: Swan

Session Chairs: Amy Clarke, Los Alamos National Laboratory; Daniel Coughlin, Los Alamos National Laboratory

2:00 PM Invited

Analysis of Dislocation Structures Caused by Phase Transformations in Nb-Mo Microalloyed Steels Using High Resolution EBSD: Nerea Isasti¹; Denis Jorge-Badiola¹; *Pello Uranga*¹; ¹CEIT and Tecnun

2:30 PM

Atom Probe Compositional Analysis of Nanoscale Precipitates in Nb/ Ti/Mo Microalloyed Steels: *Monica Kapoor*¹; Gregory Thompson¹; Ron O'Malley²; ¹University of Alabama; ²Missouri S & T

2:50 PM

Importance of Interfacial Energy in Precipitation Modeling Using Computational Thermodynamics Techniques: Andre Costa E Silva¹; ¹EEIMVR - Universidade Federal Fluminense - IBQN

3:10 PM

A Study of Microstructure and Phase Transformations of Medium-Carbon Dual-Phase Steels: *Ersoy Erisir*¹; Oguz Bilir¹; Meltem Sezen²; ¹Kocaeli University; ²Sabanci University

3:30 PM Break

3:50 PM

Effect of Annealing Temperature on Martensite Start Temperature in Intercritical Region: Ersoy Erisir¹; Oguz Bilir¹; ¹Kocaeli University

4:10 PM

Effect of Deformation Temperature and Interpass Time on Microstructure Evolution and Mechanical Properties of Medium Carbon Low Alloy Steel during Ingot Breakdown Process: *Kanwal Chadha*¹; Mohammad Jahazi¹; Abdelhalim Loucif¹; ¹ETS

4:30 PM

Phase Field Modeling of Microstructural Evolution during Intermediate Quenching and Intercritical Annealing of Medium Carbon Dual Phase Steels: Ersoy Erisir¹; Oguz Bilir¹; ¹Kocaeli University

Polycrystalline Materials: Bringing Together Experiments, Simulations, and Analytic Theories – Session VI

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Dana Zöllner, Otto von Guericke University Magdeburg; Douglas Medlin, Sandia National Laboratories; Dmitri Molodov, RWTH Aachen

Wednesday PM	Room: Oceanic 8
March 18, 2015	Location: Dolphin

Session Chairs: Dana Zöllner, Otto-von-Guericke-University Magdeburg; Dmitri Molodov, RWTH Aachen; Douglas Medlin, Sandia National Laboratories

2:00 PM

An Experimental and Numerical Study of Deformation Behavior of Steels in Biaxial Tensile Tests: *Dilip Banerjee*¹; Mark Iadicola¹; Adam Creuziger¹; Timothy Foecke¹; ¹NIST

2:20 PM

Benchmarking Multi-Scale Models with Micro-Mechanical Testing and Characterization of Ni-Base Superalloys: *David Eastman*¹; Zafir Alam¹; Jessica Krogstad²; William Lenthe³; Tresa Pollock³; Paul Shade⁴; Mike Uchic⁴; Kevin Hemker¹; ¹Johns Hopkins University; ²University of Illinois, Urbana Champaign; ³University of California, Santa Barbara; ⁴Air Force Research Laboratory

2:40 PM

Stress Induced Grain Boundary Migration: A Perspective from Bi-Crystallographic Analysis and Atomistic Simulation: *Liang Wan*¹; Ju Li²; Boyu Liu¹; Zhiwei Shan¹; ¹Xi'an Jiaotong University; ²Massachusetts Institute of Technology

3:00 PM

Multi-Scale Modeling of Subgrain formation During Cold Rolling Using a Crystal Plasticity Based Element Free Galerkin Model: Usman Ali¹; Abhijit Brahme¹; Raja Mishra²; Kaan Inal¹; ¹University of Waterloo; ²GM R&D Center

3:20 PM Concluding Comments

6th International Symposium on High Temperature Metallurgical Processing — Coking, New Energy and Environment

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Gerardo Alvear, Xstratatech; Onuralp Yucel, Istanbul Technical University; Xinping Mao, Wuhan Iron and Steel Corporation; Hong Yong Sohn, University of Utah; Naiyang Ma, ArcelorMittal; Phillip Mackey, P.J. Mackey Technology; Tom Battle, Midrex Technologies

Thursday AM	Room: Peacock
March 19, 2015	Location: Swan

Session Chairs: Naiyang Ma, ArcelorMittal; Jianliang Zhang, University of Science and Technology Beijing

8:30 AM

The Self-Reducing Pellet Production from Organic Household Waste: *Alberto Eloy Nogueira*¹; Cyro Takano¹; Marcelo Mourão¹; Adolfo Zambrano²; ¹Universidade de São Paulo; ²Pontificia Universidad Católica del Perú

8:50 AM

The Application of a Recent Thermodynamic Model for Coke Crystallites: Chemisorption of Methyl Groups, Decomposition of Natural Gas, and the Reduction of Metal Oxides: *Halvor Dalaker*¹; Philippe Ouzilleau²; Patrice Chartrand²; ¹SINTEF Materials and Chemistry; ²École Polytechnique de Montréal

9:10 AM

The Use of Metallurgical Oil Sludge as a Reductant in a High Temperature Metallurgical Process: Shu-Jing Zhu1; Ying Qin2; Jiann-Yang Hwang3; ¹Wuhan Iron and Steel Corporation; ²Wuhan University of Technology; ³Michigan Technological University

9:30 AM

Experimental Study on BF Complex Injection in Anyang Steel Company: Daqiang Cang¹; Zhenqing Zhao¹; Lingling Zhang¹; ¹University of Science and Technology Beijing

9:50 AM

Experimental Study on Combustion Characteristics and Kinetics of Semi-Coke Under Enriched-Oxygen Condition: Guangyun Wei1; Jianliang Zhang1; 1University of Science and Technology Beijing

10:10 AM Break

10:30 AM

Kinetics Between SiO and CH4 at High Temperature: Kai Tang¹; Xiang Ma1; Stefan Andersson1; Halvor Dalaker1; 1SINTEF Materials and Chemistry

10:50 AM

The Research on Process Characteristics of Different Fuels for Blast Furnace Injection: Runsheng Xu¹; Jianliang Zhang¹; Tengfei Song¹; Haiyang Wang1; Pengcheng Li1; 1University of Science and Technology Beijing

11:10 AM

Phosphorus Removal of Oolitic High Phosphorus Iron Ore Using Biomass Char: Huiqing Tang1; 1University of Science and Technology Beijing

11:30 AM

A Prediction Model for the High-Temperature Performance of Lump Coal Used in COREX: Yuan She1; Keng Wu1; Hailiang Ren1; 1University of Science and Technology Beijing

11:50 AM

Effective Utilization of Semicharcoal in Sintering: Wang Zhe1; Jianliang Zhang1; Fanyi Meng1; Runbo Wang1; 1University of Science and Technology of Beijing

6th International Symposium on High Temperature Metallurgical Processing — Utilization of Solid Slag/ Wastes and Complex Ores

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Gerardo Alvear, Xstratatech; Onuralp Yucel, Istanbul Technical University; Xinping Mao, Wuhan Iron and Steel Corporation; Hong Yong Sohn, University of Utah; Naiyang Ma, ArcelorMittal; Phillip Mackey, P.J. Mackey Technology; Tom Battle, Midrex Technologies

Thursday AM	Room: Swan 5
March 19, 2015	Location: Swan

Session Chairs: Thomas Battle, Midrex Technologies; Guanghui Li, School of Minerals Processing & Bioengineering, Central South University

8:30 AM

Analysis of Sulfidation Routes for Processing Weathered Ilmenite Concentrates Containing Impurities: Sazzad Ahmad¹; M. Akbar Rhamdhani¹; Mark Pownceby²; Warren Bruckard²; ¹Swinburne University of Technology; ²CSIRO Mineral Resources Flagship

8:50 AM

Use of Recycled Fluxes Substituting Fluorspar for Refining Operation in a BOF Reactor: Valdeci Paula Alvarenga¹; Varadarajan Seshadri²; Itavahn Alves da Silva³; Carlos Antonio da Silva³; Filipe Bueno Carvalho⁴; Sergio Luiz Costa⁵; ¹Aperam Steel Works; ²Universidade Federal de Minas Gerais; ³Universidade Federal de Ouro Preto; ⁴Aperam Steel Works; ⁵Solvi Insumos

9:10 AM

Upgrading Titania Slag Through Selective Chlorination Method Using Titanium Tetrachloride: Jungshin Kang¹; Toru Okabe²; ¹Institute of Industrial Science, The University of Tokyo; (current) Korea Institute of Geoscience and Mineral Resources; ²The University of Tokyo

9:30 AM

Research on Foam Concrete Features by Replacing Cement with Industrial Waste Residues: Baatar Sayn¹; Qige Qi¹; Gangping Ma²; Jianhua Fu¹; Jinghua Wang¹; ¹Shougang Research Institute of Technology; ²Technical Center of Shougang Energy & Environment Protection Industry Department

9:50 AM

Study on Reduction Disintegration of Sinter from Titanomagnetite Concentrate: Guanghui Li¹; Feng Zhou¹; Zhengwei Yu¹; Zhixiong You¹; Zhiwei Peng¹; Yuanbo Zhang¹; ¹School of Minerals Processing and Bioengineering, Central South University

10:10 AM Break

10:30 AM

Assessment of Gas-Metal-Slag Interaction in a Steel Making LadleThrough Physical and Mathematical Modeling: Augusto Pereira de Sa¹; Varadarajan Seshadri²; Itavahn Alves da Silva³; Filipe de Menezes Torres²; Carlos Antonio da Silva3; Eliana Ferreira Rodrigues3; 1Redemat; 2Universidade Federal de Minas Gerais; ³Universidade Federal de Ouropreto

10:50 AM

Modeling and Recovery of Iron (Fe) from Red Mud by Coal Reduction: Xiancong Zhao¹; Hongxu Li¹; Lei Wang¹; Hao Bai¹; ¹School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing

11:10 AM

Utilization of Iron-Bearing Dust in Iron Sintering with Composite Agglomeration Process: Bin Xu¹; Xiao Kang¹; Chen Liu¹; Yuanbo Zhang¹; Guanghui Li1; Tao Jiang1; 1Central South University

11:30 AM

Thermodynamics Analysis and Industrial Trials of Bottom-Blowing Smelting For Processing Lead Sulfate-Containing Materials: Weifeng Li¹; Lihua Jiang²; Jing Zhan¹; Chuanfu Zhan¹; Gui Li³; Jiann-yang Hwang⁴; ¹Central South University; ²Jiyuan Vocanionala and Technical College; ³Henan Yuguang Gold & Lead Co., Ltd.; 4 Michigan Technological University

11:50 AM

Strengthening Reduction Process of Vanadium Titano-Magnetite Adding CaF2 Under High Temperature: Xing Xiangdong¹; ¹University of Science and Technology of Beijing

12:10 PM

Research on the Technology of Producing Building Stone by Using Blast Furnace Slag: Bingji Yan¹; Jianliang Zhang¹; Hongwei Guo²; Zhiwen Shi¹; Feng Liu¹; ¹University of Science and Technology Beijing; ²Soochow University

Additive Manufacturing: Interrelationships of Fabrication, Constitutive Relationships Targeting Performance, and Feedback to Process Control — Additive Manufacturing of Polymers and Non-metals

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; David Bourell, University of Texas at Austin; Reginald Hamilton, Pennsylvania State University; James Sears, GE Global Research Center; Allison Beese, Pennsylvania State University; Rajiv Mishra, University of North Texas

Thursday AMRoom: Northern Hemisphere A1March 19, 2015Location: Dolphin

Session Chairs: Kathy Flores, Washington University ; Brecht Van Hooreweder, Ku Leuven

8:30 AM Invited

Effect of Greyscale on the Properties of High Speed Sintered Elastomers: *Adam Ellis*¹; Liam Hartley¹; Neil Hopkinson¹; ¹University of Sheffield

9:00 AM

A Quality Control Loop Based on Computer Tomography for Optimization of Laser Sintering Process of PA12 Parts: *Michele Pavan*¹; Sam Coeck¹; Piet Van den Ecker¹; Jean-Pierre Kruth²; Wim Dewulf²; Tom Craeghs¹; ¹Materialise; ²KU Leuven, Production Engineering, Machine Design and Automation

9:20 AM Invited

On the Fatigue Behavior of Selective Laser Sintered Parts in Nylon 12: *Brecht Van Hooreweder*¹; Jean-Pierre Kruth¹; ¹KU Leuven

9:50 AM Break

10:10 AM Invited

A Laser Deposition Method to Investigate Glass Formation in Metallic Alloys: Peter Tsai¹; *Katharine Flores*¹; ¹Washington University

10:40 AM

Multi-objective Optimization of the Mechanical Properties of FDM PLA Components: *Jonathan Torres*¹; Allen Owji¹; Zachary DeMastry¹; Ali Gordon¹; ¹University of Central Florida

11:00 AM

Economy of Scales: How Big Area Additive Manufacturing Couples 100X Deposition Rate with a 100X Cost Reduction: Lonnie Love¹; Brian Post¹; Randall Lind¹; Peter Lloyd¹; Chad Duty¹; Vlastimil Kunc¹; Richard Neff²; *Orlando Rios*¹; ¹Oak Ridge National Laboratory; ²Cincinnati Incorporated

Additive Manufacturing: Interrelationships of Fabrication, Constitutive Relationships Targeting Performance, and Feedback to Process Control — Advanced Characterization Techniques and Feedstock

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; David Bourell, University of Texas at Austin; Reginald Hamilton, Pennsylvania State University; James Sears, GE Global Research Center; Allison Beese, Pennsylvania State University; Rajiv Mishra, University of North Texas

Thursday AM	Room: Northern Hemisphere A2
March 19, 2015	Location: Dolphin

Session Chairs: Terry Holesinger, Los Alamos National Laboratory; Suman Das, Georgia Tech

8:30 AM Invited

Scanning Laser Epitaxy Process Development for Additive Manufacturing of Turbine Engine Hot-Section Components: Suman Das¹; Ranadip Acharya¹; Rohan Bansal¹; Justin Gambone¹; ¹Georgia Institute of Technology

9:00 AM

Microstructural Characterization and Modeling of Metal Components Produced by Additive Manufacturing: *Lyle Levine*¹; Carelyn Campbell¹; Eric Lass¹; Andrew Allen¹; Fan Zhang¹; Li Ma¹; Ruqing Xu²; Jan Ilavsky²; ¹National Institute of Standards and Technology; ²Argonne National Laboratory

9:20 AM

Investigating the Role of Powder Feedstock Recyclability in Electron Beam Melting of Ti-6Al-4V and Inconel 718: *Peeyush Nandwana*¹; Ryan Dehoff¹; Larry Lowe¹; Francisco Medina²; William Sames¹; Michael Kirka¹; William Peter¹; ¹Oak Ridge National Laboratory; ²Arcam AB

9:40 AM

Characterization of Tungsten/Polycarbonate Polymer Matrix Composites for Mechanical, Electromagnetic, and Radiation Shielding Applications: *Corey Shemelya*¹; Armando Rivera¹; Angel Torrado Perez¹; Carmen Rocha¹; Min Liang²; Craig Kief³; Jim Aarestad³; Jim Stegmann⁴; David Alexander³; Hao Xin²; Ryan Wicker¹; Eric MacDonald¹; David Roberson¹; ¹University of Texas at El Paso; ²The University of Arizona; ³COSMIAC; ⁴NASA Glenn Research Center

10:00 AM Break

10:20 AM

Production and Properties of a Wire-arc Additive Manufacturing Part Made with Friction Extruded Wire: *Xiao Li*¹; Anthony Reynolds¹; Baoqiang Cong²; Jialuo Ding²; Stewart Williams²; ¹University of South Carolina; ²Cranfield University

10:40 AM

Microstructural Evaluation of an Al Hemisphere Made by Additive Manufacturing: *Terry Holesinger*¹; Pallas Pappin¹; Thomas Lienert¹; John Carpenter¹; ¹Los Alamos National Laboratory

11:00 AM

Investigating Failure Mechanisms in Additively Manufactured Stainless Steel via In Situ Tensile Tests: Holly Barth¹; Gilbert Gallegos¹; Alastair MacDowell²; Abdel Haboub²; Wayne King¹; ¹Lawrence Livermore National Laboratory; ²Lawrence Berkeley National Laboratory

11:20 AM

Phase Transformations and Residual Stress Behavior in Additively Manufactured 316L Stainless Steel and NiTi Alloy: Amanda Wu¹; Donald Brown²; Gilbert Gallegos¹; Mukul Kumar¹; Wayne King¹; ¹Lawrence Livermore National Laboratory; ²Los Alamos National Laboratory

Advances in Solidification of Metallic Alloys under External Fields — Novel Solidification Processes and Applications

Sponsored by: TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS: Aluminum Committee, TMS: Solidification Committee

Program Organizers: Jiawei Mi, University of Hull; Dmitry Eskin, Brunel University

Thursday AM	Room: Swan 1
March 19, 2015	Location: Swan

Session Chair: Jiawei Mi, University of Hull

8:30 AM

The Solidification Structure Refinement of SWRCH22A Steel Billet Under Pulse Magneto-Oscillation Treatment: *Qixin Li*¹; Dong Liang¹; Zhan Zhou²; Yifeng Xu²; Renxing Li¹; Yongyong Gong¹; Qijie Zhai¹; ¹Shanghai University; ²Jiangsu Suzhou Steel Group Co. Ltd.

8:50 AM

A Comparative Study on the Single Crystal Growth OF CMSX-4 via Vertical Bridgman and Vertical Bridgman with a Submerged Baffle: Mert Bacak¹; Mehdi Montakhabrazlighi¹; *Ercan Balikci*¹; ¹Bogazici University

THURSDAY AM

9:10 AM

Removing Impurity Element of Copper From Pb-3%Cu Melt By Super Gravity: *Yuhou Yang*¹; Bo Song¹; Gaoyang Song¹; Shujian Jia¹; ¹University of Science and Technology Beijing

9:30 AM

The Effect of Surface Pulsed Magneto-oscillation on Solidification of Low Pressure Rotor 30Cr2Ni4MoV Steel: *Xunzhe Zhang*¹; Jing Zhao¹; Jihao Yu¹; Honggang Zhong; Qijie Zhai¹; ¹Shanghai University

Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu — Novel Casting and Molding Processes

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Laurentiu Nastac, The University of Alabama; Baicheng Liu, Tsinghua University; Hasse Fredriksson, KTH - Royal Institute of Technology; Jacques Lacaze, Université de Toulouse; Chun-Pyo Hong, Yonsei University; Adrian Catalina, Caterpillar Inc.; Andreas Buhrig-Polaczek, RWTH Aachen University; Daan Maijer, The University of British Columbia; Charles Monroe, University of Alabama at Birmingham; Adrian Sabau, Oak Ridge National Laboratory; Roxana Ruxanda, Emerson Climate Technologies; Alan Luo, The Ohio State University; Subhayu Sen, GEOCENT; Attila Diószegi, Jönköping University, School of Engineering

Thursday AM	Room: Swan 6
March 19, 2015	Location: Swan

Session Chair: Laurentiu Nastac, The University of Alabama

8:30 AM Invited

Counter-Gravity Casting: John Campbell¹; ¹University of Birmingham

8:55 AM Invited

Centrifugal Casting and Solidification in Hyper-Gravity Conditions: *Ulrike Hecht*¹; Santhanu Jana¹; Alexandre Viardin¹; Julio Aguilar¹; ¹Access e.V.

9:20 AM Invited

A Numerical Model for Predicting the Gas Evolution in Silica Sand (Furan Binder) Mold Castings: Laurentiu Nastac¹; Shian Jia¹; Mihaela Nastac²; Robert Wood²; ¹The University of Alabama; ²ExOne

9:45 AM

Characterization of Centricast Bimetallic Ni-Cr-Mo Alloy 625/X-65 Steel Pipeline: *Conrado Afonso*¹; João Guilerme Dessi¹; Antonio Andrade²; ¹Federal University of São Carlos (UFSCar); ²ENGEMASA - Materials and Engineering Ltda

10:05 AM Break

10:25 AM

Overcasting Process Development for Multi-Material Manufacturing: *Alan Luo*¹; Andrew Klarner¹; Yiqing Chen²; Hui Zhang²; Anil Sachdev³; ¹The Ohio State University; ²Hefei University of Technology; ³General Motors Global Research and Development

10:45 AM

Wetting Behavior of CMSX-4 in Grooved Channels for Investment Casting of Fine Features in Single Crystal Turbine Blades: Logan Kroneman¹; Kevin Trumble¹; Matthew Krane¹; ¹Purdue University

11:05 AM

Investigation of New Binder System for Ceramic Casting Molds: Huseyin Lus¹; Habib Saridikmen¹; *Nilgun Kuskonmaz*¹; ¹Yildiz Technical University

11:25 AM

Effect of Iron Ore Addition in Vessel as Coolant on Sticking Behaviour during Continuous Casting of Slab: *PP Sahoo*¹; Pabitra Palai¹; ¹Tata Steel Ltd.

Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu — Solidification Processing V

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Laurentiu Nastac, The University of Alabama; Baicheng Liu, Tsinghua University; Hasse Fredriksson, KTH - Royal Institute of Technology; Jacques Lacaze, Université de Toulouse; Chun-Pyo Hong, Yonsei University; Adrian Catalina, Caterpillar Inc.; Andreas Buhrig-Polaczek, RWTH Aachen University; Daan Maijer, The University of British Columbia; Charles Monroe, University of Alabama at Birmingham; Adrian Sabau, Oak Ridge National Laboratory; Roxana Ruxanda, Emerson Climate Technologies; Alan Luo, The Ohio State University; Subhayu Sen, GEOCENT; Attila Diószegi, Jönköping University, School of Engineering

Thursday AM	Room: Swan 7
March 19, 2015	Location: Swar

Session Chair: Afina Lupulescu, ASM International

8:30 AM

Integrated Computational Materials Engineering for Advanced High-Strength Cast Iron: Nicholas Hatcher¹; *James Saal*¹; David Snyder¹; Jiadong Gong¹; Jason Sebastian¹; Geneva Trotter²; Greg Olson¹; Richard Huff³; ¹QuesTek Innovations; ²Dartmouth College; ³Caterpillar, Inc

8:50 AM

Microstructure Investigation of Aluminum Die-Cast Parts with Different Gating Conditions Tested in Fatigue: *Roxana Ruxanda*¹; Richard Obara¹; ¹Emerson Climate Technologies

9:10 AM

Dependence of Hardness and Microstructure in the Directionally Solidified Sn-40wt.%Bi-0.7wt.%Cu Alloy: Bismarck Silva¹; *José Spinelli*¹; ¹Federal University of São Carlos

9:30 AM

Investigation of Thin-Walled IN718 Castings by Counter-Gravity Investment Casting: *Anping Dong*¹; Naishun Yan¹; Jiao Zhang¹; Jun Wang¹; Baode Sun¹; Haiyan Gao¹; Da Shu¹; ¹Shanghai Jiao Tong University

9:50 AM

High Strain Processing of Rapidly Solidified Metallic Composites: Sundeep Mukherjee¹; ¹University of North Texas

10:10 AM Break

10:30 AM

Numerical Simulation on the Macro-Segregation Formation in the Bloom Round Casting: *Haibo Sun*¹; Liejun Li¹; Xiaowen Cheng²; Wensheng Qiu²; Lingyu Zeng²; ¹School of Mechanical & Automotive Engineering, South China University of Technology; ²Baosteel Group Guangdong Shaoguan Iron & Steel Co., Ltd.

10:50 AM

Use of X-ray Tomography for Characterizing Graphite Morphology in High Strength Cast Iron: *Dileep Singh*¹; ¹Argonne National Laboratory

11:10 AM

Thermal Test of Nodular Cast Iron Cooling Stave: *Jin Zheng*¹; Hai-bin Zuo¹; Feng-guang Li¹; Jian-liang Zhang¹; ¹University of Science & Technology Beijing

11:30 AM

Shrinkage Porosity of Gray, Ductile and Compacted Graphite Iron and Its Relationship with Solidification Structures: Juan Massone¹; Marcos López¹; Graciela Rivera¹; Roberto Boeri¹; ¹National University of Mar del Plata

Advances in Thin Films for Electronics and Photonics — Multifunctional Materials for Sensing and Electronics

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee *Program Organizers:* Federico Rosei, INRS; Nuggehalli Ravindra,

New Jersey Institute of Technology; Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Terry Alford, Arizona State University

Thursday AM	Room: Europe 7
March 19, 2015	Location: Dolphin

Session Chair: Nate Quitoriano, McGill

8:30 AM Invited

Additive Integration of Advanced Sensors for Multifunctional Applications: *Pooran Joshi*¹; ¹ORNL

9:00 AM Invited

Analyzing Bulk Oxide and Oxide/Semiconductor Interface Properties in Thermally Grown Oxides on SiC and Si by Means of D2O Vapors Absorption: *Joseph Bloch*¹; Gang Liu¹; Boris Yakshinskiy¹; Leszek Wielunski¹; Can Xu¹; Torgny Gustafsson¹; Leonard Feldman¹; ¹Rutgers University

9:30 AM Invited

Complex Oxides on Semiconductors for Nanoelectronic Applications: Lucie Mazet¹; Romain Bachelet¹; Guillaume Saint-Girons¹; M Hytch¹; S, Schamm-Chardon²; *Catherine Dubourdieu*³; ¹Institut des Nanotechnologies de Lyon, CNRS; ²CEMES, CNRS, Université de Toulouse; ³CNRS-INL

9:55 AM Break

10:15 AM Invited

Effect of Antiferromagnetic Film Thickness on Exchange Bias Field in SFMO/SFWO Multilayers: *Deepak Kumar*¹; Davinder Kaur²; ¹Graphic Era University Dehradun; ²IIT Roorkee

10:40 AM Invited

High Mobility Conducting Metal Oxides - Gateway Materials for Mid-IR Plasmonics: *Jon-Paul Maria*¹; Edward Sachet¹; Joshua Harris¹; Douglas Irving¹; Benjamine Gaddy¹; Brian Donovan²; Patrick Hopkins²; ¹North Carolina State University; ²University of Virginia

11:05 AM Invited

Investigation into the Surface Stress Variation as a Function of Applied Compressive Stress and Temperature in Microscale Silicon: Ming Gan¹; *Vikas Tomar*¹; ¹Purdue University

11:30 AM Invited

PV Optics-cigs: Optical Software for Design and Analysis of Cu(InGa) Se2-Based Solar Cells: *Bhushan Sopori*; Peter Rupnowski¹; James Mutitu²; William Shafarman²; ¹National Renewable Energy Laboratory; ²University of Delaware

THURSDAY AM

Aluminum Alloys: Development, Characterization, and Applications — Corrosion Resistance and Emerging Technologies

Sponsored by: TMS Light Metals Division, TMS: Aluminum Processing Committee

Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix,LLC; Tongguang Zhai, University of Kentucky

Thursday AM	Room: Northern Hemisphere E4
March 19, 2015	Location: Dolphin

Session Chair: William Golumbfskie, Naval Surface Warfare Center

8:30 AM Invited

The Effects of Processing and External Conditions on the Sensitization of Marine Aluminum Alloys: *William Golumbfskie*¹; Jennifer Gaies¹; Nicholas Jones¹; Mitra Taheri²; ¹Naval Surface Warfare Center, Carderock Division; ²Drexel University

8:55 AM

Roll-bonded Al-Si/Al-Mn-Zn-X/Al-Si Clad Sheets Fabricated from Twin-Roll-Cast Bare Alloys: *Kwangjun Euh*¹; Hyoung Wook Kim¹; Yun Soo Lee¹; Su Hyeon Kim¹; ¹Korea Institute of Materials Science

9:15 AM

Aluminum Extrusion Susceptibility to Sensitization: William Golumbfskie¹; ¹Naval Surface Warfare Center, Carderock Division

9:35 AM

In-situ Elevated Temperature Transmission Electron Microscopy of Sensitized Aluminum-Magnesium Alloy Treated by Ultrasonic Impact Treatment: *Kim Ngoc Tran*¹; Lourdes Salamanca-Riba²; Wen-An Chiou²; ¹Naval Surface Warfare Carderock Division; ²University of Maryland

9:55 AM

The Role of Hydrogen Embrittlement in Intergranular Stress Corrosion Cracking of Aluminum-Magnesium Alloys: Cortney Crane¹; Richard Gangloff²; ¹Exponent; ²University of Virginia

10:15 AM Break

10:30 AM

Formation of Intermetallic Phases in Al-Sc-Zr Alloys Prepared by Electrolytic Deposition in Na3AlF6 Melts: Zengjie Wang¹; Jilai Xue²; ¹Beijing University of Technology; ²University of Science and Technology

10:50 AM

Use of Nano-Structured Silanols on the Solidification Aluminum-Silicon Based Casting Alloys: *Yang Lu*¹; Andre Lee¹; Allen Roche²; Tsung-Yu Pan²; ¹Michigan State University; ²Vinci Technology Corporation

11:10 AM

Influence of Intermetallic Particles on Fracture Behaviors of Al-Zn-Mg-Cu Alloys: *Hang Su*¹; Hiroyuki Toda¹; Takuro Yoshimura¹; Kentaro Uesugi²; Akihisa Takeuchi²; Yoshio Suzuki²; Nobuto Sakaguchi³; Yoshio Watanabe³; ¹Kyushu University; ²Japan Synchrotron Radiation Research Institute; ³UACJ Corporation

Aluminum Alloys: Development, Characterization, and Applications — Precipitation Behaviors

Sponsored by: TMS Light Metals Division, TMS: Aluminum Processing Committee

Program Örganizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix,LLC; Tongguang Zhai, University of Kentucky

Thursday AM	Room: Northern Hemisphere E3
March 19, 2015	Location: Dolphin

Session Chair: Tongguang Zhai, University of Kentucky

8:30 AM Keynote

Studies of Precipitation in 6000 Al-Mg-Si Alloys by HRTEM: Kenji Matsuda¹; ¹University of Toyama

9:00 AM Invited

Microstructure and Interfaces of Grain Boundary Al2CuLi Plates of Al-3Cu-2Li: Ramasis Goswami¹; Noam Bernstein¹; ¹Naval Research Laboratory

9:20 AM

Effects of Temper and Aging Temperature on Precipitation inAl 5xxx Alloys: *Gaosong Yi*¹; David Cullen²; Alexander Derrick¹; Michael Free¹; ¹University of Utah; ²Oak Ridge National Lab

9:40 AM Invited

A Study of Formation Mechanism and Recrystallization Behavior of Mn Containing Precipitates during Homogenization in 6xxx Series Aluminum Alloys: Gongwang Zhang¹; Yi Han²; Yi Xu²; Hiromi Nagaumi²; Gang Sha³; Chad Parish⁴; Tongguang Zhai¹; ¹University of Kentucky; ²Suzhou Research Institute for Nonferrous Metals; ³Nanjing University of Science and Technology; ⁴Oak Ridge National Laboratory

10:05 AM Break

10:20 AM

Influence of Temperature on Natural Aging Kinetics of AA6061 Modified with Sn: *Marion Werinos*¹; Helmut Antrekowitsch¹; Werner Fragner²; Thomas Ebner³; Peter Uggowitzer⁴; Stefan Pogatscher⁴; ¹Montanuniversitaet Leoben; ²AMAG Austria Metall AG; ³AMAG Rolling GmbH; ⁴ETH Zurich

10:40 AM

Nanoscale Precipitation-Strengthened Al-Er-Sc-Zr-(V,Nb,Ta) Alloys: *Keith Knipling*¹; Nhon Vo²; David Dunand³; David Seidman³; ¹Naval Research Laboratory; ²NanoAl LLC; ³Northwestern University

11:00 AM

Bringing the Science of Precipitation in Aluminum Alloys to the Shop Floor: *Babak Raeisinia*¹; Tudor Piroteala¹; Paul Nolan¹; Ernst Kozeschnik²; ¹Novelis Global R&T Center; ²Vienna University of Technology

11:20 AM Invited

Producing Nanostructured Aluminum Alloys for Advanced Electrotechnical Application Using Severe Plastic Deformation: *Ruslan Valiev*¹; M.Yu. Murashkin¹; G.I. Raab¹; Aleksandr Krokhin²; ¹Institute of Physics of Advanced Materials, Ufa State Aviation Technical University; ²Rusal GM

11:40 AM

Influence of Plastic Deformation on the Precipitation Sequence in a AA6061 Aluminium Alloy: *Chbihi Abdelahad*¹; Vincent Sébastien¹; Ribis Joel²; Toffolon-Masclet Caroline²; Garnier Jerome¹; ¹CEA/DEN/DANS/DMN/SRMA/LC2M; ²CEA/DEN/DANS/DMN/SRMA/LA2M

Aluminum Reduction Technology — Joint Session on Electrodes and Operations (with Electrode Technology)

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pascal Lavoie, LMRC

Thursday AM	Room: Southern Hemisphere V
March 19, 2015	Location: Dolphin

Session Chair: Xianan Liao, Elkem Carbon

8:30 AM Introductory Comments

8:35 AM

In-Situ Formation of Slots in Søderberg Anodes: *Alton Tabereaux*¹; Xiangwen Wang²; ¹Consultant; ²Alcoa Inc.

9:00 AM

Non-Linear Stability Analysis of Cells Having Different Types of Cathode Surface Geometry: *Marc Dupuis*¹; Valdis Bojarevics²; ¹GéniSim Inc.; ²Greenwich University

9:25 AM

The influence of Cathode Shape on Current Density and Metal Heave in **300 kA Aluminum Reduction Cell**: *Yang Song*¹; Naixiang Feng¹; Jianping Peng¹; Baokuan Li¹; Qiang Wang¹; ¹Northeastern University

9:50 AM

Detailed Electrochemical Wear Mechanisms of Cathode in Hall-Héroult Cells: *Tao L1*¹; Stein Tore Johansen²; Asbjørn Solheim²; ¹Norwegian University of Science and Technology; ²SINTEF Materials and Chemistry

10:15 AM Break

10:30 AM

Electroslag Welding(ESW): A New Option for Smelters to Weld Aluminum Bus Bars: *Bertrand Leroux*¹; ¹Canmec Ind

10:55 AM

The Resistibility of Semi-graphitic Cathode to Alkali Metal (K and Na) Penetration: *Fang Zhao*¹; Hai-lin Kong¹; Lin-bo Li¹; Tao Hong¹; ¹School of Metallurgical Engineering, Xi'an University of Architecture and Technology

11:20 AM

The Status and Development Trends of Carbon Cathode Materials in China: *Shuchao Zhang*¹; Zhongming Zhao²; Baoguo Chen³; ¹Zhengzhou Research Institute of Chalco; ²Shanxi Shanjin Carbon Co., Ltd.; ³Henan Luoyang Wanji Aluminium Co., Ltd.

Aluminum Reduction Technology — Modelling

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee Program Organizer: Pascal Lavoie, LMRC

Thursday AM	Room: Southern Hemisphere III
March 19, 2015	Location: Dolphin

Session Chair: Mark Cooksey, CSIRO

8:30 AM Introductory Comments

8:35 AM

3D Coupled MHD and Thermoelectrical Modelling Applied to AP Technology Pots: *Steve Langlois*¹; Jacques Rappaz²; Olivier Martin¹; Yves Caratini¹; Michel Flueck²; Alexandre Masserey³; Gilles Steiner³; ¹Rio Tinto Alcan; ²EPFL; ³Ycoor Systems

9:00 AM

A Model Based Study of Cell Electrical Preheating Practices At DUBAL: Alexander Arkhipov¹; Abdalla Zarouni¹; Sergey Akhmetov¹; Lalit Mishra¹; Amal Al Jasmi¹; ¹Emirates Global Aluminium (EGA)

9:25 AM

Mathematical Modelling of Hall-Heroult Pot Instability and Verification by Measurements of Anode Current Distribution: Valdis Bojarevics¹; James Evans²; ¹University of Greenwich; ²University of California Berkeley and Wireless Industrial Technologies, Inc.

9:50 AM

Bubble Flow in a Static Magnetic Field: *Subrat Das*¹; Dinushke Weerasiri¹; Veeriah Jegatheesan¹; ¹Deakin University

10:15 AM Break

10:30 AM

The Impact of Bubble-Bubble Interaction on Anodic Gas Release; A Water Model Analysis: Are Simonsen¹; Kristian Einarsrud²; Ingo Eick³; ¹SINTEF; ²HIST; ³Hydro Aluminium Deutchland GmbH

10:55 AM

Observation of Anodic Bubble Behaviors on Unslotted Anode and Slotted Anode in a Laboratory Scale Transparent Aluminium Electrolysis Cell: Zhao Zhibin¹; Yuqing Feng²; Bingliang Gao¹; *Zhaowen Wang*¹; Zhongning Shi¹; Xianwei Hu¹; ¹Northeastern University; ²CSIRO

11:20 AM

Impact of Copper Inserts in Collector Bars: René von Kaenel¹; Jacques Antille¹; Louis Bugnion¹; ¹KAN-NAK SA

Biological Materials Science Symposium — Biomimetic Systems IV

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Kalpana Katti, North Dakota State University; Rajendra Kasinath, DePuy Synthes Products, LLC; Michael Porter, Clemson University; Francois Barthelat, McGill University

Thursday AM	
March 19, 2015	

Room: Swan 9 Location: Swan

Session Chairs: Candan Tamerler, University of Kansas; Michael Porter, Clemson University

8:30 AM

4-D Imaging by X-ray Microtomography of the Failure Behaviour in Cuttlebone: *Laura North*¹; Ed Pope¹; Ching Wong¹; Richard Johnston¹; ¹Swansea University

8:50 AM

Characterization of the Degradation Behavior of Mg-Zr-Sr Alloys for Biomedical Applications: *Yunfei Ding*¹; Jixing Lin²; Cuie Wen³; Peter Hodgson¹; Yuncang Li¹; ¹Deakin University; ²Zhejiang Industry & Trade Vocational College; ³Swinburne University of Technology

9:10 AM

Cold Working Commercially Pure Ti for Dental Implants Applications: *Carlos Elias*¹; Celso Resende¹; Jochen Roestel²; ¹Instituto Militar de Engenharia; ²Conexão Sistemas de Prótese

9:30 AM

Injectable Solids: Hydrogel Property and Nanostructure Control Through Peptide Design and Solution Assembly: *Darrin Pochan*¹; ¹University of Delaware

9:50 AM Break

10:10 AM

Inspirations from Reptilian Eggshells for Novel Polymer-Based Composites: *Yin Chang*¹; Po-Yu Chen¹; ¹National Tsing Hua University

10:30 AM

Nano-Film Polymerization Process by Plasma-Deposited SnO2 for Biomaterial Applications: Study on Electrical Properties of Capacitor and Thin-Film Transistor: *Mei-Chen Liu*¹; ¹Ming Chi University of Technology

10:50 AM

New Lessons from Nature by Revisiting Seashell's Multiscale Architectures: *Xiaodong Li*¹; ¹University of Virginia

11:10 AM

Phase Transforming Cellular Materials: Pablo Zavattieri¹; David Restrepo¹; Nilesh Mankame²; ¹Purdue University; ²General Motors Research and Development

11:30 AM

Protective Function of Pangolin Scales: Structure and Mechanical Properties: *Bin Wang*¹; Wen Yang²; Marc Meyers¹; ¹University of California, San Diego; ²ETH Zurich

Bulk Metallic Glasses XII — General Session

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Hahn Choo, Univ of Tennessee; Yanfei Gao, Univ of Tennessee

Thursday AM	Room: Asia 3
March 19, 2015	Location: Dolphin

Session Chairs: Mingwei Chen, Tohoku University; Ki Buem Kim, Sejong University

8:30 AM Invited

Fabrication and Properties of Amorphous Alloy Surface by Laser Surface Treatment: *Shujie Pang*¹; Ying Liu¹; Qi Zhang¹; Tao Zhang¹; ¹Beihang University

8:50 AM

THURSDAY AM

Atomic Structural Evolution of Metallic Glass at Cryogenic Temperatures: Xilei Bian¹; G. Wang¹; Z.Y. Liu¹; J. Bednarcík²; M.B. Tang³; Y.L. Gao¹; Q.J. Zhai¹; Norbert Mattern⁴; Jurgen Eckert⁵; Takeshi Egami⁶; ¹Shanghai University; ²Hasylab at Desy; ³Shanghai Institute of Ceramics; ⁴IFW Dresden; ⁵IFW Dresden and TU Dresden; ⁶University of Tennessee

9:10 AM

On the Short-Range Orders in Spinodal Pd–Ni–P Bulk Metallic Glasses: *Zhenduo Wu*¹; Wenzhao Zhou¹; Yin Fung Lo¹; Si Lan²; Hin Wing Kui¹; ¹CUHK; ²City University of Hong Kong

9:30 AM Invited

Structural and Mechanical Properties of Rejuvenated Amorphous Metals: *Shigenobu Ogata*¹; Masato Wakeda¹; ¹Osaka University

9:50 AM

Processing of Bulk Metallic Glass-Forming Liquids Monitored via High-Speed Thermography: Fabian Haag¹; Jörg Löffler¹; ¹ETH Zurich

10:10 AM Break

10:25 AM Invited

Work-Hardening and Plastic Deformation Behavior of TiCu-Based Bulk Metallic Glass Composites: Sung Hwan Hong¹; *Ki Buem Kim*¹; Jin Man Park²; Young Sang Na³; Ka Ram Lim³; ¹Sejong University; ²Samsung Electronics; ³KIMS

10:45 AM

Spatially-Resolved Mechanical and Compositional Characterization of Metallic Glass Matrix Composites: *Kelly Kranjc*¹; Allen Hunter²; Vicente Araullo-Peters²; Emmanuelle Marquis²; Douglas Hofmann³; Wolfgang Windl⁴; Katharine Flores¹; ¹Washington University; ²University of Michigan; ³NASA Jet Propulsion Laboratory; ⁴Ohio State University

11:05 AM

Intrinsic Size Effect in Metallic Glass Nanowires: *Qi Zhang*¹; Qi-Kai Li²; Mo Li¹; ¹Georgia Institute of Technology; ²Tsinghua University

11:25 AM Invited

Hidden Order in Disordered Metallic Glasses: Akihiko Hirata¹; *Mingwei Chen*¹; ¹Tohoku University

11:45 AM Invited

Electrochemical Micromachining of Passive Fe-Based Bulk Metallic Glasses: Annett Gebert¹; Sylvia Horn¹; Ralph Sueptitz¹; Mihai Stoica¹; Juergen Eckert¹; Margitta Uhlemann¹; ¹Leibniz-Institute for Solid State and Materials Research IFW Dresden

12:05 PM Invited

Evaluating a Commercial Bulk Metallic Glass Casting Process: *Stephanie O'Keeffe*¹; Sean O'Keeffe¹; Adam Verreault¹; Joseph Stevick¹; Glenton Jelbert¹; ¹Liquidmetal Technologies

CALPHAD-Based ICME Research for Materials Genomic Design — Materials Genome: ICME and CALPHAD-Based Materials Design 5

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS: Alloy Phases Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Wei Xiong, Northwestern University; Shihkang Lin, National Cheng Kung University; Chao Jiang, Thermo-Calc Software Inc; Shenyang Hu, Pacific Northwest National Laboratory; Wen-dung Hsu, National Cheng Kung University; Sinn-wen Chen, National Tsinghua University; Shuanglin Chen, CompuTherm LLC

Thursday AM	Room: Northern Hemisphere A4
March 19, 2015	Location: Dolphin

Session Chairs: Malin Selleby, KTH Royal Institute of Technology; Wei Xiong, Northwestern University; Jiadong Gong, QuesTek Innovations; Shih-kang Lin, National Cheng Kung University; Ricardo Komai, Northwestern University

8:30 AM Keynote

CALPHAD Based Design of Creep Resistant Steels with Superior Properties: *Sybrand Van Der Zwaag*¹; Qi Lu¹; Wei Xu¹; ¹Technical University Delft

9:05 AM Keynote

Physical Properties by CALPHAD Modelling: *Xiao-Gang Lu*¹; ¹Shanghai University

9:40 AM

Development and Application of a Magnesium Alloy Atomic Mobility Database: *Philipp Alieninov*¹; Zachary Bryan¹; Michele Manuel¹; ¹University of Florida

10:00 AM Break

10:15 AM

Solidification of Single Crystal Superalloys Designed by a Combined Method of Neural Network and CALPHAD: *Mehdi Montakhabrazlighi*¹; Mert Bacak¹; Ercan Balikci¹; ¹Bogazici University

10:35 AM

Thermodynamic Database for Ternary and Quaternary Manganese Silicides: Alexandre Berche¹; Jean-Claude Tédenac¹; Solange Vivès²; Stéphane Gorsse²; *Philippe Jund*¹; ¹Institut Charles Gerhardt; ²ICMCB

10:55 AM

Anisotropy and Structural Roughness of the Solid-Liquid Interface of Some Elemental Metals: *Yongquan Wu*¹; Yewei Jiang¹; Junjiang Xiao¹; Yongli Sun¹; ¹Shanghai University

11:15 AM

Experimental Study of Phase Relationship of the Sm-Zr and Mg-Rich Corner of Mg-Sm-Zr System: *Tian Yin*¹; Jieyu Zhang¹; ¹Shanghai Key Laboratory of Modern Metallurgy and Materials Processing, Shanghai University

Characterization of Minerals, Metals, and Materials — Characterization of Clays and Ceramics

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chenguang Bai, Chongqing University; Juan Pablo Escobedo, University of New South Wales; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Neves Monteiro, Military Institute of Engineering, IME, Materials Science Department; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal; Jian Li, CanmetMATERIALS

Thursday AM	Room: Mockingbird 1
March 19, 2015	Location: Swan

Session Chairs: Robert Blair, University of Idaho; Afonso Azevedo, UENF

8:30 AM

Doubling the Life of Concrete Through Microstructural Changes-Chemical Admixtures as Nanoviscosity Modifiers to Reduce the Permeability to Moisture: *Robert Blair*¹; Robert Miner¹; Qasem AlNasser¹; Yongfeng Chang¹; Batric Pesic¹; ¹University of Idaho

8:50 AM

Investigation of Thermal Properties of Illite-Based Ceramic Materials by the Use of Acoustic Emission Technique: *Michal Knapek*¹; Frantisek Chmelik¹; Tomas Hulan²; Patrik Dobron¹; Anton Trnik²; Igor Stubna²; ¹Charles University in Prague; ²Constantine the Philosopher University in Nitra

9:10 AM

Alumina Superfines Based Geopolymeres: Developments and Characterization: *Nilton Nagem*¹; Marcos Aurelio Costa²; Valeria Silva²; Andreia Henriques¹; Alexandra Mansur¹; Antonio Peres¹; Herman Mansur¹; ¹Universidade Federal de Minas Gerais; ²ALUMAR

9:30 AM

Densification and Mechanical Properties of Reaction Sintered Al₂O₃-MgO-CaO Refractory: *Lei Xu*¹; Liang-yu Jin¹; Xue-liang Yin¹; Min Chen¹; ¹School of Materials and Metallurgy, Northeastern University

9:50 AM

Influence of Sintering Temperature on Microstructure and Properties of Magnesia Partially Stabilized Zirconia Ceramics: Lan Jiang¹; Shuqiang Guo¹; Yinhe Liu¹; Yuyang Bian¹; Song Chen¹; Xingxing Zhang¹; Gonghui Yang¹; Weizhong Ding¹; ¹Shanghai University

10:10 AM Break

10:20 AM

Identification of Cleavage Planes of Single-Crystal Silicon Carbide Using Single and Sequential Knoop Indentations: *Cody Kunka*¹; Alison Trachet¹; Ghatu Subhash¹; ¹University of Florida

10:40 AM

Brazilian Bentonite Submitted to Mild Acid Treatment under Moderated Conditions: *Christiano Gianesi Bastos Andrade*¹; Valquiria Justo¹; Danilo Fermino¹; Maria da Graça Valenzuela¹; Cristina Volzone²; Francisco Valenzuela-Diaz¹; ¹USP POLI; ²CETMIC

11:00 AM

Increase of Flexural Strength of Red Ceramic Pieces Incorporated With Ornamental Rock Waste: Application of Weibull Statistic for Determination of Best Firing Temperature: Carla Piazzarollo¹; Gustavo Xavier¹; Jonas Alexandre¹; Sergio Monteiro²; Afonso Azevedo¹; ¹UENF; ²IME

11:20 AM

Structure and Microwave Dielectric Properties Correlation in Ba(**Zn**_{1/3}**Ta**_{2/3})**O**₃ – **LaGaO**₃ **Ceramics:** *Swathi Manivannan*¹; Santhosh Kumar Gunapu¹; Pramod Kumar Sharma²; K.C James Raju¹; Dibakar Das¹; ¹University of Hyderabad; ²Institute for Plasma Research

Characterization of Minerals, Metals, and Materials — Characterization of Electronic, Magnetic, Environmental, and Advanced Materials

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chenguang Bai, Chongqing University; Juan Pablo Escobedo, University of New South Wales; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Neves Monteiro, Military Institute of Engineering, IME, Materials Science Department; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal; Jian Li, CanmetMATERIALS

Thursday AM March 19, 2015 Room: Pelican 1 Location: Swan

Session Chairs: Shadia Ikhmayies, Al Isra University; Walman Castro, Universidade Federal de Campina Grande

8:30 AM

Shape Memory Characteristics of Rapidly Solidified Ti-37,8Cu-18,7Ni Alloy Ribbons: Walman Castro¹; Alana Ramos¹; ¹Universidade Federal de Campina Grande

8:50 AM

Material Stability at Light Ion Irradiated Oxide Interfaces: *Jeffery Aguiar*¹; Pratik Dholabhai¹; Amit Misra²; Blas Uberuaga¹; ¹Los Alamos National Laboratory; ²University of Michigan

9:10 AM

Effect of Casting Conditions on the Structure and Magnetic Properties of the Co-19 at.%Al-6 at. %WAlloy: *Nataliya Kazantseva*¹; Natalia Stepanova²; Mihail Rigmant²; Denis Davidov²; Denis Shishkin²; Eugeni Romanov²; ¹Institute of Metal Physics ; ²Institute of Metal Physics

9:30 AM

Characterization of the Phase Composition of Nanosized Lithium Titanates Synthesized By Inductive Thermal Plasma: François Quesnel¹; *Gervais Soucy*¹; Jocelyn Veilleux¹; Pierre Hovington²; Wen Zhu²; Karim Zaghib²; ¹Université de Sherbrooke; ²Institut de recherche - Hydro-Québec

9:50 AM

Optical Parameters of CdS1-yTex Thin Films: *Shadia Ikhmayies*¹; ¹Al Isra University

10:10 AM Break

10:20 AM

Structural and Magnetic Characterization of Soft-Magnetic Alloy (Fe-Co and Ni-Fe) Gas Atomized, Prealloyed Powders: *Tanjore Jayaraman*¹; Gregory Del Corso¹; David Novotnak¹; Michael Schmidt¹; ¹Carpenter Technology Corporation

10:40 AM

Temperature Dependence of Magnetic Properties of Er-Substituted Cobalt-Ferrites Synthesized by Sol-Gel Assisted Auto-Combustion Method: Sateesh Prathapani¹; Monaji Reddy²; Tanjore Jayaraman³; *Dibakar Das*²; ¹Department of Metallurgical Engineering and Materials Science, Indian Institute of Technology-Bombay; ²School of Engineering Sciences and Technology, University of Hyderabad; ³Department of Mechanical and Materials Engineering, University of Nebraska - Lincoln

11:00 AM

Characterization of MnAl Magnetic Alloys: *Ozgun Acar*¹; Merve Genc¹; Ilkay Kalay²; Eren Kalay¹; ¹METU; ²Cankaya University

11:20 AM

Magnetic Data Storage on Thermal Spray Coatings (WCCoCr): Gian Luigi Angrisani¹; Patrick Knödler¹; Kai Möhwald¹; ¹Leibniz Universität Hannover

11:40 AM

Pulsed Electrodeposition of Nano-Crystalline Ni with Uniform Co-Depostion of Micron Sized Diamond Particles on Annealed Copper Substrate: *Prashant Kumar*¹; ¹Indian Institute of Technology Banaras Hindu University Varanasi

Computational Thermodynamics and Kinetics — Models and Methods

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Maryam Ghazisaeidi, The Ohio-State University; Vidvuds Ozolins, University of California Los Angeles

Thursday AM	Room: Oceanic 3
March 19, 2015	Location: Dolphin

Session Chairs: Blazej Grabowski, Max-Planck-Institut für Eisenforschung; David Landau, University of Georgia

8:30 AM Invited

Importance of Anharmonicity in fcc Metals: An Ab Initio Study: *Blazej Grabowski*¹; Albert Glensk¹; Tilmann Hickel¹; Jörg Neugebauer¹; ¹Max-Planck-Institut für Eisenforschung

9:00 AM

Step Free Energies Calculated in Atomistic Simulations by Thermodynamic Integration and Capillary Fluctuation Methods: Rodrigo Freitas¹; *Timofey Frolov*¹; Asta Mark¹; ¹UC Berkeley

9:20 AM

THURSDAY AM

VASPsol: An Implicit Solvation Model for Density-Functional Calculations: Richard Hennig¹; Kiran Mathew²; ¹University of Florida; ²Cornell University

9:40 AM Invited

Replica Exchange Wang-Landau Sampling: Pushing the Limits of Monte Carlo Simulations for Materials Science: *David Landau*¹; Thomas Vogel¹; Ying Wai Li²; Dilina Perera¹; Markus Eisenbach²; ¹University of Georgia; ²Oak Ridge National Laboratory

10:10 AM Break

10:25 AM

A Dynamic Random Lattice Potts Model for Grain Growth and the Elimination of Lattice Anisotropy Effects: *Philip Goins*¹; Elizabeth Holm¹; ¹Carnegie Mellon University

10:45 AM Invited

Ten-Fold Speed Up of DFT: Improving k-point Integration: *Gus Hart*¹; ¹Brigham Young University

11:15 AM

Predicting Low Thermal Conductivity Si-Ge Nanowires: Jesper Kristensen¹; *Nicholas Zabaras*²; ¹Cornell University; ²University of Warwick

11:35 AM

Mathematical Simulation of Temperature and Stress History for Additive Manufacturing: Hyung Chae¹; *Jyotirmoy Mazumder*¹; ¹University of Michigan

Computational Thermodynamics and Kinetics — Phase Field Modeling

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Maryam Ghazisaeidi, The Ohio-State University; Vidvuds Ozolins, University of California Los Angeles

Thursday AM	Room: Oceanic 2
March 19, 2015	Location: Dolphin

Session Chair: To Be Announced

8:30 AM

A Simple Two-Mode Phase-Field Crystal Model for Solid-Liquid Equilibrium: *Ebrahim Asadi*¹; Mohsen Asle Zaeem¹; ¹Missouri University of Science and Technology

8:50 AM

A Phase Field Crystal Approach to Magnetism: *Matthew Seymour*¹; Nikolas Provatas¹; ¹McGill

9:10 AM

Amending the Theory of Non-Cooperative Eutectoid Transformation: Insights from Phase-Field Simulations: *Kumar Ankit*¹; Britta Nestler¹; ¹Institute of Applied Materials-Reliability of Components and Systems, Karlsruhe Institute of Technology

9:30 AM

Phase Field Crystal Modeling as a Unified Atomistic Approach to Defect Dynamics: *Joel Berry*¹; Nikolas Provatas²; Joerg Rottler³; Chad Sinclair³; ¹Princeton University; ²McGill University; ³University of British Columbia

9:50 AM Break

10:05 AM

Rapid Model Development in Phase Field Simulation: *Daniel Schwen*¹; Michael Tonks¹; ¹Idaho National Laboratory

10:25 AM

Simulation of LiFePO4 Nanoparticle Microstructure with a Coupled Phase-Field, Elastomechanics and Surface Tension Model: *Michael Welland*¹; Devin O'Connor²; Olle Heinonen¹; Peter Voorhees²; Dieter Wolf¹; ¹Argonne National Laboratory; ²Northwestern University

10:45 AM

Optimized Phase Field Modeling for Concurrent Nucleation and Growth: *Ramanarayan Hariharaputran*¹; Pavlo Rutkevych¹; David T Wu¹; ¹Institute of High Performance Computing, Agency for Science, Technology and Research, Singapore

11:05 AM

Phase Field Microelasticity Model of Dislocation Climb – Methodology and Applications: *Jia-Hong Ke*¹; Andrew Boyne²; C. Robert Kao¹; Yunzhi Wang²; ¹National Taiwan University; ²Ohio State University

Drying, Roasting, and Calcining of Minerals — Induration and Sintering

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee Program Organizer: Thomas Battle, Midrex Technologies

Thursday AMRoom: Grand Harbor Salon 3March 19, 2015Location: Yacht & Beach

Session Chairs: Thomas Battle, Midrex Technologies; P. Chris Pistorius, Carnegie Mellon University

8:30 AM

Prediction of Non-Isothermal Oxidation of Magnetite Pellets: P. Chris Pistorius¹; Ming Tang¹; ¹Carnegie Mellon University

8:50 AM

Monitoring the Ring Formation in Rotary Kiln for Pellet Firing: Deqing Zhu¹; *Xianlin Zhou*¹; Yanhong Luo¹; Jian Pan¹; Cailing Zhen²; Guixiang Huang²; ¹Central South University; ²WISCO Minerals

9:10 AM

Study On The Improvement Of Preheating And Roasting Characteristics Of Pellet Made By Organic-Bentonite Compound Binder: YuFeng Guo¹; Ting Duan¹; Andrew Yakovlevich Travyanov²; Tao Jiang¹; Shuai Wang¹; FuQiang Zheng¹; ¹Central South University, Hunan; ²National University of Science and Technology "MISiS"

9:30 AM

Effects of Anthracite on Pelletization of Hematite Ore: Zhaokun Tang¹; Mingjun Rao¹; Yuanbo Zhang¹; *Guanghui Li*¹; ¹School of Minerals Processing and Bioengineering, Central South University

9:50 AM Break

10:10 AM

Thermal Decomposition Behavior and Kinetics of Siderite Ore: Deqing Zhu¹; Yanhong Luo¹; Jian Pan¹; Xianlin Zhou¹; ¹Central South University

10:30 AM

Preparation of Straw Char by Preformation-Carbonization Process and Its Application in Iron Ore Sintering: Xiaohui Fan¹; *Zhiyun Ji*¹; Min Gan¹; Xuling Chen¹; Liang Yin¹; Tao Jiang¹; ¹Central South University

10:50 AM

Influence of Modified Biomass Fuel on Iron Ore Sintering: *Min Gan*¹; Xiaohui Fan¹; Zhiyun Ji¹; Xuling Chen¹; Tao Jiang¹; Guanghui Li¹; Zhiyuan Yu¹; ¹Central South University

11:10 AM

Gas and Liquid Permeability of Tuyere Coke in COREX Melter Gasifier: Wenlong Zhan¹; Keng Wu¹; Yong Zhao¹; Xiao Liu¹; Qihang Liu¹; ¹University of Science and Technology Beijing

11:30 AM

The Phase Transformation of Baiyunebo Iron Ore Treated with Reductant Sintering: Bingyi Bai¹; Jieyu Zhang¹; *Lifeng Yang*¹; ¹Shanghai University

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) — Plenary Session II

Sponsored by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Program Organizers: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory; Brian Bliss, Association for Iron and Steel Technology (AIST); Jeffrey Fergus, Auburn University; Ali Memari, Penn State University; Jonathan Motherwell, Jonathan T. Motherwell and Associates, LLC; Carol Russell, Environmental Protection Agency; Emily Sarver, Virginia Tech; Darlene Schuster, AICHE's Institute for Sustainability; Deborah Shields, Colorado State University

Thursday AM March 19, 2015 Room: Asbury A Location: Yacht & Beach

Funding support provided by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Session Chair: Diran Apelian, Worcester Polytechnic Institute

8:30 AM Introductory Comments

8:40 AM Plenary

A Healthy Home is a Fractal Home: *Matthew Grocoff*¹; ¹THRIVE Net Zero Energy Collaborative

9:10 AM Plenary

Sustainable Development Practices and the Minerals Industry: Jessica Elzea Kogel¹; ¹Imerys

9:40 AM Plenary

Sustainable Policy from Washington and the States: A Role For the Engineer: Mark Burtschi¹; ¹ArcelorMittal USA

10:10 AM Break

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) — Alloys for the Future

Sponsored by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Program Organizers: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory; Brian Bliss, Association for Iron and Steel Technology (AIST); Jeffrey Fergus, Auburn University; Ali Memari, Penn State University; Jonathan Motherwell, Jonathan T. Motherwell and Associates, LLC; Carol Russell, Environmental Protection Agency; Emily Sarver, Virginia Tech; Darlene Schuster, AICHE's Institute for Sustainability; Deborah Shields, Colorado State University

Thursday AM March 19, 2015 Room: Asbury A Location: Yacht & Beach

Funding support provided by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Session Chair: Iver Anderson, Ames Laboratory

10:30 AM Introductory Comments

10:35 AM

Application of MIVM for Cu-Ni Alloy in Vacuum Distillation: *Lingxin Kong*¹; Bin Yang¹; Baoqiang Xu¹; Yifu Li¹; Dachun Liu¹; ¹The National Engineering Laboratory for Vacuum Metallurgy, Kunming University of Science and Technology; State Key Laboratory of Complex Nonferrous Metal Resources Clear Utilization; Key Laboratory for Nonferrous Vacuum Metallurgy of Yunnan Province

11:00 AM

Effect of Continuous and Pulsed Current Tungsten Inert Gas Welding of Cast Aluminum-Magnesium-Scandium Alloy: K Subbaiah¹; ¹SSN College of Engineering

11:25 AM

Improvement of Low Temperature Formability of AZ31 Magnesium Alloy by High Speed Rolling: *Jing Su*¹; Mehdi Sanjari¹; Abu Syed Humanuar Kabir¹; In-ho Jung¹; Steve Yue¹; ¹McGill

Fatigue in Materials: Fundamentals, Multiscale Modeling, Life Prediction and Prevention — Fatigue Behaviors of Engineering Alloys

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Antonios Kontsos, Drexel University

Thursday AM	Room: Australia 3
March 19, 2015	Location: Dolphin

Session Chairs: Antonios Kontsos, Drexel University; Brian Jordon, University of Alabama

8:30 AM Invited

Fatigue Deformation Behavior and Performance of a High Strength and Ductility Mg-Zn-Al-Cu-Mn Magnesium Alloy and Its Friction Stir Welded Joints: *Yuansheng Yang*¹; Tianjiao Luo¹; ¹Institute of Metal Research, Chinese Academy of Sciences

8:55 AM

Microstructure Effect on Ultrasonic Fatigue Properties of IN718 Alloys: *Damien Texier*¹; Patrick Villechaise²; Jonathan Cormier²; Stéphane Pierret³; Chris Torbet⁴; Tresa Pollock⁴; ¹Institut Pprime - ENSMA / UCSB; ²Institut Pprime - ENSMA; ³Snecma – SAFRAN Group; ⁴UCSB

9:20 AM Invited

Investigating Small Fatigue Crack Growth Behavior in Ti-6242S Using Ultrasonic Fatigue and Scanning Electron Microscopy: Jason Geathers¹; Christopher Torbet²; J Wayne Jones¹; Samantha Daly¹; ¹University of Michigan; ²University of California- Santa Barbara

9:45 AM Invited

Elucidating the Effect of Residual Stresses on Fatigue Damage in Self-Pierce Riveting: *J Jordon*¹; Joao Moraes¹; Harish Rao¹; T Rushing²; ¹The University of Alabama; ²US Army Corps of Engineers

10:10 AM Break

10:20 AM

Crack microstructure interaction in plain carbon steels in the Very High Cycle Fatigue (VHCF) regime: *Jochen Bach*¹; Heinz Werner Höppel¹; Mathias Göken¹; ¹Friedrich-Alexander-Universität Erlangen-Nürnberg

10:40 AM

Fatigue Early Damage State Detection for Helicopter Gear Using Acoustic Emission and Neural Networks: Fady Barsoum¹; ¹Embry-Riddle Aeronautical University

11:00 AM

Crack Incubation and Small Fatigue Crack Growth for AZ31 Magnesium Alloy: *Jonathan Pegues*¹; Marcos Lugo¹; Nima Shamsaei¹; ¹Mississippi State University

11:20 AM

Fatigue Life Predictions for Irradiated Stainless Steels: *Robert Fuller*¹; Nima Shamsaei²; ¹Entergy Operations; ²Mississippi State University

11:40 AM

The Effect of Scratch Damage on the Fatigue Performance of a Nickel-Based Superalloy for Aerospace Applications: *Jonathan Boukhobza*¹; Hangyue Li¹; Paul Bowen¹; Julian Clark²; ¹University of Birmingham; ²Rolls-Royce plc

Friction Stir Welding and Processing VIII — Simulations and Measurements

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee *Program Organizers:* Rajiv Mishra, University of North Texas; Murray

Mahoney, retired from Rockwell Scientific; Yutaka Sato, Tohoku University; Yuri Hovanski, Pacific Northwest National Laboratory

Thursday AM	Room: Northern Hemisphere A3
March 19, 2015	Location: Dolphin

Session Chair: Judith Schneider, Mississippi State University

8:30 AM Invited

Prediction of Joint Line Movement and Temperatures in Friction Stir Spot Welding of DP 980 Steel: *Michael Miles*¹; Utsab Karki¹; Taeseon Lee¹; Yuri Hovanski²; ¹BYU; ²PNNL

8:50 AM Invited

Microstructure and Properties, Temperature Predictions, and Effects of Nano-Ceramic Reinforcement in Wrought and Cast Aluminum Alloys Fabricated by Friction Stir Processing and Welding: Yi Pan¹; Diana Lados¹; ¹Worcester Polytechnic Institution

9:10 AM

Application of Acoustic Emission as an Effective Tool to Monitor FSW of AA2024-T3 Aluminum Alloy: *B M Rajaprakash*¹; Suresaha C N²; Sarala Upadhya¹; ¹University Visvesvaraya College of Engineering; ²Jyothy Institute of Technology

9:30 AM

Development of Processing Maps for Friction-Stir Welding (FSW) of Aluminum Using a Phenomenological Based Semi-Physical Model: *Elizabeth Hoyos*¹; Diana María López Ochoa²; Hernán Álvarez²; ¹Escuela de Ingeniería de Antioquia; ²Universidad Nacional de Colombia

9:50 AM Break

10:10 AM

On the Material Behavior at Tool/Workpiece Interface during Friction Stir Welding: A CFD Based Numerical Study: Gaoqiang Chen¹; Qingyu Shi¹; Zhili Feng²; ¹Tsinghua University; ²Oak Ridge National Laboratory

10:30 AM

Modeling of Microstructural Evolution during Friction Stir Welding Applied to AA2024 Aluminum Alloys to Predict the Weld Mechanical Properties: Valentine Legrand¹; Sabrina Gastebois¹; Gildas Guillemot¹; Charles-André Gandin¹; Lionel Fourment¹; Jean-Jacques Rousse²; Julie Vaudour²; ¹MINES Paristech; ²Daher-Socata

10:50 AM

Friction Stir Welding of AZ31B Magnesium Alloy with 6061-T6 Aluminum Alloy: Influence of Processing Parameters on Microstructure and Mechanical Properties: Bilal Mansoor¹; *Abdelhakim Dorbane*¹; G. Ayoub²; A. Imad³; ¹Texas A&M University at Qatar; ²American University of Beirut; ³University of Lille

11:10 AM

Simulation of Thin Friction Stir Welding (FSW) on Dissimilar Materials Joint: *Mokhtar Awang*¹; Sattar Emamian¹; Farazila Yusof²; Patthi Hussain¹; ¹Universiti Teknologi Petronas; ²Universiti Malaya

THURSDAY AM

High-Entropy Alloys III — General Session

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Michael Gao, National Energy Technology Lab; Suveen Mathaudhu, University of California Riverside

Thursday AM	Room: Oceanic 8
March 19, 2015	Location: Dolphin

Session Chairs: Xie Xie, University of Tennessee; Gong Li, The University of Tenessee

8:30 AM Invited

Deformation Twinning in the High-Entropy Alloy Induced by High Pressure Torsion at Room Temperature: *Gong Li*¹; P.F. Yu²; P.K. Liaw¹; R.P. Liu²; ¹University of Tennessee; ²Yanshan University

8:50 AM

Microstructures and Mechanical Behavior of Multi-Component AlxCrCuFeMnNi High-Entropy Alloys: *Haoyan Diao*¹; Zhinan An¹; Xie Xie¹; Gongyao Wang¹; Chuan Zhang²; Fan Zhang²; Guangfeng Zhao³; Fuqian Yang³; Karin Dahmen⁴; Peter Liaw¹; ¹University of Tennessee, Knoxville; ²CompuTherm, LLC; ³University of Kentucky; ⁴University of Illinois at Urbana-Champaign

9:10 AM

Structure and Properties of Some CoCrFeNi-Based High Entropy Alloys: *Juan Cornide*¹; Ulf Dahlborg¹; Zhao Leong²; Laura Asensio Domínguez²; Jean Juraszek¹; Samuel Jouen¹; Thomas Hansen³; Rainer Wunderlich⁴; Sylvain Chambreland¹; Ian Todd²; Russell Goodall²; Monique Calvo-Dahlborg¹; ¹University of Rouen; ²The University of Sheffield; ³Institute Laue-Langevin; ⁴University of Ulm

9:30 AM

The Characterization of Serrated Plastic Flow in High Entropy Alloys: Shuying Chen¹; Xie Xie¹; James Antonaglia²; Junwei Qiao³; Yong Zhang⁴; Karin Dahmen²; Peter Liaw¹; ¹University of Tennessee, Knoxville; ²University of Illinois at Urbana-Champaign; ³Taiyuan University of Technology; ⁴University of Science and Technology Beijing

10:10 AM

Solid Solution Hardening Modelling from Binary Systems to High Entropy Alloys: *Isaac Toda-Caraballo*¹; Pedro Rivera-Díaz-del-Castillo¹; ¹University of Cambridge

9:50 AM

On the Grain Boundary Engineering of CrMnFeCoNi High Entropy Alloy: *Bo-Ru Chen*¹; Chi Lee¹; An-Chou Yeh¹; Jien-Wei Yeh¹; ¹National Tsing Hua University

High-Entropy Alloys III — Modeling and Mechanical Properties

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Michael Gao, National Energy Technology Lab; Suveen Mathaudhu, University of California Riverside

Thursday AM March 19, 2015 Room: Oceanic 5 Location: Dolphin

Session Chairs: Karin Dahmen, University of Illinois at Urbana Champaign; Michael Gao, National Energy Technology Lab

8:30 AM Invited

A Model for the Deformation Mechanisms and the Serration Statistics of High Entropy Alloys: *Karin Dahmen*¹; Bobby Carroll¹; Xie Xie²; Shuying Chen²; James Antonaglia¹; Braden Brinkman¹; Michael LeBlanc¹; Marina Laktionova³; Elena Tabachnikova³; Zhi Tang²; Junwei Qiao⁴; Jien Wei Yeh⁵; Chi Lee⁵; Che Wei Tsai⁵; Jonathan Uhl; Peter Liaw²; ¹University of Illinois at Urbana Champaign; ²University of Tennessee; ³B.I. Verkin Institute for Low Temperature Physics and Engineering of National Academy of Sciences of Ukraine; ⁴Taiyuan University of Technology; ⁵National Tsing Hua University

8:50 AM Invited

In-Situ Neutron Diffraction and Elastic-Viscoplastic Self-Consistent (EVPSC) Modeling Study of Deformation Behavior of a High-Entropy Alloy: Shang-Yi Tu¹; Huamiao Wang²; Dunji Yu³; Soo Yeol Lee⁴; Ke An⁵; Jien-Wei Yeh⁶; E-Wen Huang⁷; ¹National Central University; ²McMaster University; ³Tianjin University; ⁴Chungnam National University; ⁵Oak Ridge National Laboratory; ⁶National Tsing Hua University; ⁷National Chiao Tung University

9:10 AM Invited

Segregation and Ti-Zr-Hf-Ni-Pd-Pt High Entropy Alloy under Liquid State: Y. Yokoyama¹; Norbert Mattern²; Akitoshi Mizuno³; Gongyao Wang⁴; Peter Liaw⁴; ¹Tohoku University; ²IFW Dresden; ³Gakushuin University; ⁴University of Tennessee

9:30 AM Invited

Computational-Thermodynamics-Aided Development of Multiple-Principal-Component Alloys: *Chuan Zhang*¹; Fan Zhang¹; Shuanglin Chen¹; Weisheng Cao¹; Jun Zhu¹; Zhi Tang²; Haoyan Diao²; Peter K. Liaw²; ¹CompuTherm LLC; ²University of Tennessee

9:50 AM Break

10:05 AM

First-Principles Studies of NiFeCrCoMn High Entropy Alloys: *Changning Niu*¹; Alex Zaddach¹; Tripp Hurt¹; Adedapo Oni¹; James LaBeau¹; Carl Koch¹; Douglas Irving¹; ¹NC State University

10:25 AM Invited

On the Entropy Sources of High-Entropy Alloys: *Michael Gao*¹; Mike Widom²; Jeff Hawk³; David Alman³; ¹NETL/URS; ²Carnegie Mellon University; ³NETL

10:45 AM

Molecular Statics and Molecular Dynamics Simulations of Dislocation Behavior in Model FCC and BCC Multicomponent Concentrated Solid Solution Alloys: *Satish Rao*¹; Christopher Woodward²; Dennis Dimiduk²; Triplicane Parthasarathy¹; Daniel Miracle²; William Curtin³; ¹UES Inc.; ²Air Force research laboratory; ³EPFL

11:05 AM Invited

Phase Diagram Calculations, Ab Initio Molecular Dynamic Simulations, and Experimental Characterizations of Cast AlCoFeCuNi High Entropy Alloy: Mohsen Beyramali Kivy¹; *Mohsen Asle Zaeem*¹; ¹Missouri University of Science and Technology

11:25 AM Invited

Sputter Deposition Simulation of High Entropy Alloy via Molecular Dynamics Methodology: *Yunche Wang*¹; Chun-Yi Wu¹; Nai-Hua Yeh¹; Peter Liaw²; ¹National Cheng Kung University; ²University of Tennessee

High-Temperature Systems for Energy Conversion and Storage — Innovation in Energy Conversion and Storage II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee

Program Organizers: Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Kyle Brinkman, Clemson University; Paul Ohodnicki, National Energy Technology Laboratory; Amit Shyam, Oak Ridge National Laboratory; Jung Pyung Choi, Pacific Northwest National Laboratory

Thursday AM	Room: Grand Harbor Salon 1
March 19, 2015	Location: Yacht & Beach

Session Chairs: Amit Shyam, Oak Ridge National Laboratory; Ryan Cooper, Oak Ridge National Laboratory

8:30 AM Introductory Comments

8:40 AM Invited

Role of Length Scale and Temperature in Ultra High Temperature Properties of Materials Examined Using Nanoindentation: Yang Zhang¹; Sudipta Biswas¹; Jonathan Marsh¹; Vikas Tomar¹; ¹Purdue University

9:15 AM

Effect of Scandium and Hafnium on High Temperature Oxidation Performance of Single and Co-Doped CoNiCrAl Alloys: *H-F Wang*¹; Y-D Zhang¹; S Salam¹; W - X Fu¹; C Zhang¹; Z-G Yang¹; ¹Tsinghua University

9:40 AM Invited

Interfacial Reactions between Transition Metal Spinel Oxide Coatings and Solid Oxide Fuel Cell Interconnects: *Jeffrey Fergus*¹; Kangli Wang¹; Dileep Kumar C.J.¹; Yingjia Liu¹; Honglong Wang¹; ¹Auburn University

10:15 AM Break

10:35 AM

Experimental Phase Stability of LSCF Perovskite and Stabilized Zirconia (MSZ, M=Y,Sc) for Oxygen Membranes: *Maria Mora Tovar*¹; Shadi Darvish¹; Vadym Drozd¹; Surendra Saxena¹; Yu Zhong¹; ¹Florida International University. CesMEC

11:00 AM

The Application of Thermal Barrier Coatings on Metallic Foam Core Sandwich Structures for High Temperature Applications: Saeid Salavati¹; Thomas Coyle¹; Javad Mostaghimi¹; ¹University of Toronto

11:25 AM Invited

Dip Coating Process Application for Reactive Air Aluminization for Planar SOFC Stacks: *Jung Pyung Choi*¹; Jeffry Stevenson¹; Diana Tran¹; Jeff Bonnett¹; Matt Chou¹; ¹Pacific Northwest National Laboratory

Integrative Materials Design II: Performance and Sustainability — Advanced Materials Characterization and Modeling for Integrated Design

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical

Behavior of Materials Committee, TMS: Materials and Society Committee

Program Organizers: Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Labs; Michael Sangid, Purdue University; Weizhou Li, Caterpillar Inc

Thursday AM	Room: Grand Harbor Salon 8
March 19, 2015	Location: Yacht & Beach

Session Chairs: Michael Sangid, Purdue University; Paul Shade, Air Force Research Laboratory

8:30 AM Invited

Changing the Paradigm for Engineering Design by Merging High Energy X-ray Data with Materials Modeling: *Paul Shade*¹; Jay Schuren¹; Joel Bernier²; Shiu Li²; Basil Blank³; Jonathan Lind⁴; Peter Kenesei⁵; Ulrich Lienert⁶; Robert Suter⁴; Todd Turner¹; Dennis Dimiduk¹; Jonathan Almer⁵; ¹Air Force Research Laboratory; ²Lawrence Livermore National Laboratory; ³PulseRay; ⁴Carnegie Mellon University; ⁵Argonne National Laboratory; ⁶DESY-Petra III

8:55 AM Invited

Towards The Computational Design of Damage-Tolerant Materials: Characterization and Modeling of Microstructural Effects on Porosity Evolution of Polycrystalline Metals: *Ricardo Lebensohn*¹; Reeju Pokharel¹; Bjorn Clausen¹; Rick Chartrand¹; Chris Chen¹; Brian Patterson¹; David Menasche²; Robert Suter²; Paul Shade³; Jay Schuren³; ¹Los Alamos National Laboratory; ²Carnegie-Mellon University; ³Air Force Research Laboratory

9:20 AM Invited

Brittle to Ductile to Anomalously Ductile! Predictive Computational Materials Discovery: Duane Johnson¹; ¹Ames Laboratory/Iowa State University

9:45 AM Invited

4D Measurements of Microstructural Evolution: J.W. Gibbs¹; K.A. Mohan²; E.B. Gulsoy¹; A. Shahaini¹; X. Xiao³; C. Bouman²; M. DeGraef⁴; *Peter Voorhees*¹; ¹Northwestern University; ²Purdue University; ³Argonne National Laboratory; ⁴Carnegie Mellon University

10:10 AM Break

10:30 AM Invited

A Combined Experimental-Simulation Study Of Temperature Effects on the Deformation Response of Polycrystalline Materials: *Diana Farkas*¹; Ian Robertson²; Gary Was³; ¹Virginia Tech; ²University of Wisconsin; ³University of Michigan

10:55 AM Invited

Prediction of Effects of Grain Boundaries and Interfaces on Slip Transfer and Damage Nucleation: *Thomas Bieler*¹; Philip Eisenlohr¹; Yang Su¹; Harsha Phukan¹; Chen Zhang¹; Martin Crimp¹; ¹Michigan State University

11:20 AM Invited

Grain Boundary Network Design: *Oliver Johnson*¹; Christopher Schuh¹; ¹Massachusetts Institute of Technology

11:45 AM Invited

Application of High Resolution Electron Backscatter Diffraction Technique in Measuring Local Elastic Strains: Hamidreza Abdolvand¹; Angus Wilkinson²; ¹The University of Oxford ; ²The University of Oxford

Integrative Materials Design II: Performance and Sustainability — Linkages between Processing, Microstructure, and Performance

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee, TMS: Mechanical Behavior of Materials Committee, TMS: Materials and Society Committee

Program Organizers: Diana A. Lados, Worcester Polytechnic Institute; Brad Boyce, Sandia National Labs; Michael Sangid, Purdue University; Weizhou Li, Caterpillar Inc

Thursday AMRoom: Grand Harbor Salon 5March 19, 2015Location: Yacht & Beach

Session Chairs: Diana Lados, Worcester Polytechnic Institute; Weizhou Li, Caterpillar Inc.

8:30 AM Invited

Characterization and Integration of Experimentally Measured 3D Grain Boundary Networks with Modeling: *Amanda Levinson*¹; David Rowenhorst²; Alexis Lewis³; ¹National Research Council Fellow, Naval Research Lab; ²Naval Research Lab; ³Formerly Naval Research Lab

8:55 AM Invited

Ultrafine Grained Processing of 9310 Steel: Sammy Tin¹; Tom Kozmel¹; David Snyder²; Edward Chen³; Charlie Chen³; ¹Illinois Institute of Technology; ²Questek; ³Transition 45 Technologies

9:20 AM Invited

Unusual Applications of Cutting and Sliding: Metals Manufacturing: James Mann¹; Kevin Trumble²; W Compton²; *Srinivasan Chandrasekar*²; ¹M4 Sciences LLC; ²Purdue University

9:45 AM

Effect of Processing Route on the Microstructure and Residual Stresses within Shipbuilding Steel Plates: *Md Shamsujjoha*¹; Sean Agnew¹; James Fitz-Gerald¹; Christopher Story²; ¹University of Virginia; ²Newport News Shipbuilding

10:05 AM Break

10:25 AM

Strength and Stability in Ultrafinegrained and Nanotwinned Carbonyl Nickel: *Heather Murdoch*¹; Kristopher Darling¹; AJ Roberts¹; Laszlo Kecskes¹; Eric Klier¹; Joseph Pickens²; ¹Army Research Lab; ²Periodic Innovation

10:45 AM

Fatigue Crack Growth in Structural Aluminum Alloys: Microstructural Mechanisms, Modeling Strategies, and Integrated Design: *Anthony Spangenberger*¹; Diana Lados¹; ¹Worcester Polytechnic Institute, Integrative Materials Design Center

11:05 AM Invited

Investigating the Fatigue Behavior of Aluminum-Based Shape Memory Alloy Self-Healing (SMASH) Technology: *Hunter Henderson*¹; Oscar Figueroa¹; Michael Kesler¹; Pingping Zhu²; Maria Wright³; John Newman⁴; L Brinson²; Terryl Wallace⁴; Michele Manuel¹; ¹University of Florida; ²Northwestern University; ³NASA Kennedy Space Center; ⁴NASA Langley Research Center

11:30 AM

Fatigue Crack Growth Modeling and Mechanisms in Engine Materials under Hot Compressive Dwell Conditions: *Xiang Chen*¹; Diana Lados¹; Richard Pettit²; ¹Worcester Polytechnic Institute; ²FractureLab

Magnesium Technology 2015 — Biomedical Applications

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: Michele Manuel, University of Florida; Martyn Alderman, Magnesium Elektron; Alok Singh, National Institute for Materials Science; Neale Neelameggham, Ind LLC

Thursday AM March 19, 2015 Room: Northern Hemisphere E1 Location: Dolphin

Session Chairs: Raymond Decker, Nanomag; Norbert Hort, MagIC-Magnesium Innovation Center

8:30 AM

Mechanical and Corrosive Properties of Two Magnesium Wires: Mg4Gd and Mg6Ag: *Petra Maier*¹; Gabor Szakács²; Marcin Wala¹; Norbert Hort³; ¹University of Applied Sciences Stralsund; ²Helmholtz-Zentrum Geesthacht ; ³Helmholtz-Zentrum Geesthacht

8:50 AM

Degradation Behavior of Mg-Ca Nail after Penetration into Artificial Bone: *Naoko Ikeo*¹; Junichi Shimizu¹; Chihiro Ishigaki¹; Yuya Sano²; Yoshinaka Shimizu²; Toshiji Mukai¹; ¹Kobe University; ²Tohoku University

9:10 AM

Effects of Ti and TiB₂ Nanoparticulates on Room Temperature Mechanical Properties and In Vitro Degradation of Pure Mg: Ganesh Kumar Meenashisundaram¹; Mui Hoon Nai¹; Manoj Gupta¹; ¹National University of Singapore

9:30 AM

Effects of Heat Treatment on Bio-Corrosion Properties of Mg-Zn-xMn(x= 0.5, 1.0, and 1.5 wt.%) Alloys as Biodegradable Materials: *Wonseok Yang*¹; Young-Ok Yoon¹; Shae K. Kim¹; Hyunkyu Lim¹; Do Hyang Kim²; ¹KITECH; ²Yonsei university

9:50 AM Break

10:10 AM

Microstructure and Properties of Magnesium Alloy Mg-1Zn-1Ca (ZX11): Lydia Katsarou¹; Kalidass Suresh²; Kamineni Rao²; Norbert Hort¹; Carsten Blawert¹; Chamini Mendis¹; Hajo Dieringa¹; ¹Helmholtz-Zentrum Geesthacht; ²City University of Hong Kong

10:30 AM

Powder Metallurgical Synthesis of Mg-Hydroxyapatite Biodegradable Composites for Biomedical Applications: Cesar Stüpp¹; Chamini Mendis¹; Gábor Szakács¹; Felix Gensch²; Sören Müller²; Frank Feyerabend¹; Dachamir Hotza³; Marcio Fredel³; Norbert Horl¹; ¹Helmholtz-Zentrum Geesthacht; ²Forschungszentrum Strangpressen, TU Berlin; ³Universidade Federal de Santa Catarina, Brazil

10:50 AM

Correlation between Mechanical Behaviour and Microstructure in the Mg-Ca-Si-Sr System for Degradable Biomaterials Based On Thermodynamic Calculations: Andrea Gil Santos¹; Gabor Szakacs²; Nele Moelans¹; Norbert Hort²; Omer Van der Biest¹; ¹KU Leuven; ²Helmholtz-Zentrum Geesthacht

11:10 AM

Investigation of Al Coated Mg for Biomedical Applications: *Nabila Elmrabet*¹; Martin Roe¹; Nigel Neate¹; David Grant¹; Paul Brown¹; ¹University of nottingham

Magnesium Technology 2015 — Functional and Emerging Alloys

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: Michele Manuel, University of Florida; Martyn Alderman, Magnesium Elektron; Alok Singh, National Institute for Materials Science; Neale Neelameggham, Ind LLC

Thursday AMRoom: Northern Hemisphere E2March 19, 2015Location: Dolphin

Session Chair: Vineet Joshi, Pacific Northwest National Laboratory

8:30 AM

Microstructure and Mechanical Properties of a Magnesium-Aluminium-Erbium Alloy: Sankaranarayanan Seetharaman¹; Baushu Milton Ng¹; Jayalakshmi Subramanian¹; Ganesh Kumar Meenashisundaram¹; Nguyen Quybau¹; Manoj Gupta¹; ¹National University of Singapore, Singapore

8:50 AM

Microstructure and Properties of Cobalt- and Zinc-Containing Magnetic Magnesium Alloys Processed by High-Pressure Die Casting: *Christian Klose*¹; Christian Demminger; Hans Jürgen Maier¹; ¹Leibniz Universität Hannover

9:10 AM

Effect of La Addition on Thermal Conductivity and Mechanical Properties of Mg-4Zn-0.5CaO Alloys: *Gun Young Oh*¹; Young-ok Yoon¹; Shae K. Kim¹; Hyunkyu Lim¹; Young-jig Kim²; ¹KITECH; ²Sungkyunkwan University

9:30 AM

Deformation Response of Mg-Y Alloys under Dynamic Loading: *Toshiji Mukai*¹; Masaki Nagao¹; Tomofumi Terada¹; Hidetoshi Somekawa²; Alok Singh²; ¹Kobe University; ²National Institute for Materials Science

Materials and Fuels for the Current and Advanced Nuclear Reactors IV — Structural Materials IV

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory

Thursday AM	Room: Grand Harbor Salon 6
March 19, 2015	Location: Yacht & Beach

Session Chair: Kumar Sridharan, University of Wisconsin, Madison

8:30 AM

Synchrotron X-Ray Diffraction Characterization to Elucidate Oxidation of Advanced Steel Cladding Alloys; APMT and Alloy-33: *Mohamed Elbakhshwan*¹; Simerjeet Gill¹; Raul Rebak²; Lynne Ecker¹; ¹Department on Nuclear Science and Technology, Brookhaven National Laboratory; ²General Electric Global Research

8:50 AM

THURSDAY AM

Supercritical Carbon-Dioxide System for Materials Corrosion Testing: Lucas Teeter¹; Fei Teng¹; Wade Marcum¹; Jay Kruzic¹; Mark Anderson²; Julie Tucker¹; ¹Oregon State University; ²University of Wisconsin - Madison

9:10 AM

Thermal Degradation of Cast Duplex Stainless Steels: *Sarah Mburu*¹; R. Prakash Kolli¹; Daniel Perea²; Sreeramamurthy Ankem¹; ¹University of Maryland; ²Pacific Northwest National Laboratory

9:30 AM

Effects of Alloying and Processing Modifications on Precipitation and Strength in P92-like Alloys: *Kristin Tippey*¹; Kip Findley¹; John Speer¹; Kester Clarke²; Amy Clarke²; Paul Jablonski³; Omer Dogan³; ¹Colorado School of Mines; ²Los Alamos National Laboratory; ³National Energy Technology Laboratory

9:50 AM

Radiation-Tolerant Nanoceramic Coatings for Next Generation Nuclear Systems: Francisco Garcia Ferre¹; Alexander Mairov²; Luca Ceseracciu¹; Cédric Baumier³; Odile Kaitasov³; Yves Serruys⁴; Lucile Beck⁴; Marco Beghi⁵; Kumar Sridharan²; Fabio Di Fonzo¹; ¹Istituto Italiano di Tecnologia; ²University of Wisconsin-Madison; ³CNRS/IN2P3/CSNSM/SEMIRAMIS, Université Paris Sud; ⁴Laboratoire JANNUS; ⁵Politecnico di Milano

10:10 AM Break

10:30 AM

The Deformation Behaviours of Long-Term Thermal Aged Duplex Stainless Steels Studied By In-Situ High-Energy X-ray Diffraction and In-Situ Scanning Electron Microscope: *Shilei Li*¹; Xitao Wang¹; ¹University of Science and Technology Beijing

10:50 AM

A Comparison of High-Intensity Neutron Sources for Fusion Materials Development: *Zhehui Wang*¹; Richard Sheffield¹; Houyang Guo²; Cris Barnes¹; Stuart Maloy¹; C Morris¹; D Rej¹; Kurt Schoenberg¹; Susan Seestrom¹; J. Shlachter¹; Yongqiang Wang¹; ¹Los Alamos National Laboratory; ²General Atomics

11:10 AM

Creep Resistance and Material Degradation of a Candidate Ni-Mo-Cr Corrosion Resistant Alloy for Application in a Molten Salt Nuclear Reactor: Sachin Shrestha¹; Dhriti Bhattacharyya¹; Rohan Holmes¹; Dorji Chavara¹; Tim Nicholls¹; Elizabeth Budzakoska-Testone¹; Massey De Los Reyes¹; Roman Voskoboynikov¹; Zhijun Li²; Guangzhou Yuan²; Michael Drew¹; Lyndon Edwards¹; ¹Australian Nuclear Science and Technology Organization (ANSTO); ²Shanghai Institute of Applied Physics

11:30 AM

Ni2Cr-Type Long-Range Ordering in IN690 and Ni-Cr Binary Alloys: *Bharat Gwalani*¹; Talukder Alam¹; Tanaporn Rojhirunsakool¹; Soumya Nag²; Cody Miller³; Michael Kaufman³; Wenjun Kuang⁴; G. S. Was⁴; Kim Suk Young⁵; Rajarshi Banerjee¹; ¹University of North Texas; ²GE Global Research; ³Colorado School of Mines; ⁴University of Michigan, Michigan; ⁵Nuclear Materials Research Department, KAERI

Microstructural Processes in Irradiated Materials — Novel Modeling, Methods, and Phenomena

Sponsored by: TMŠ: Nuclear Materials Committee Program Organizers: Dane Morgan, University of Wisconsin -Madison; Thak Sang Byun, Oak Ridge National Laboratory; Yasuyoshi Nagai, Tohoku University; Zhijie Jiao, University of Michigan; Kai Nordlund, University of Helsinki; Ming-Jie Zheng, University of Wisconsin

Thursday AM March 19, 2015 Room: Asia 1 Location: Dolphin

Funding support provided by: Idaho National Laboratory and Oak Ridge National Laboratory

Session Chair: Dane Morgan, University of Wisconsin - Madison

8:30 AM

Modeling Gas Bubble Evolution on Grain Boundaries under Irradiation: *Stanislav Golubov*¹; Alexander Barashev¹; Roger Stoller¹; ¹ORNL

8:45 AM

An Investigation of the Applied Stress Effect on Void Swelling Behavior of Polycrystalline Stainless Steel Using Phase-Field Method: Kunok Chang¹; Gyeong-geun Lee¹; Junhyun Kwon¹; ¹Korea Atomic Energy Research Institute

9:00 AM

Dynamical Phase Diagrams Under Irradiation: Thomas Schuler¹; Maylise Nastar¹; ¹CEA/SRMP

9:15 AM

Effect of Point Defect Sinks on Irradiation Induced Compositional Patterning: *Shipeng Shu*¹; Xuan Zhang¹; Pascal Bellon¹; Robert Averback¹; ¹University of Illinois at Urbana-Champaign

9:30 AM

Investigation of Microstructural Evolution in Cu-W and Cu-Ni-W Systems under Irradiation Using *In-Situ* Electrical Resistivity Measurements and Electron Microscopy: *Xuan Zhang*¹; Robert Averback¹; Pascal Bellon¹; ¹University of Illinois at Urbana-Champaign

9:45 AM

A New Self-Healing Paradigm of Radiation Damage: Grain Boundary Bulging and Recovery: *Xiangyan Li*¹; Wei Liu¹; Yichun Xu¹; Changsong Liu¹; Bicai Pan²; Yunfeng Liang¹; Qianfeng Fang¹; Junling Chen³; Guangnan Luo³; Zhiguang Wang⁴; Yong Dai⁵; ¹Institute of Solid State Physics, Chinese Academy of Sciences; ²University of Science and Technology of China; ³Institute of Plasma Physics, Chinese Academy of Sciences; ⁴Institute of Modern Physics, Chinese Academy of Sciences; ⁵Spallation Neutron Source Division, Paul Scherrer Institut

Nano- and Micro-Mechanical Measurements in Harsh Environments — Small Scale Testing at Non-Ambient Temperature

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee *Program Organizers:* Peter Hosemann, UC Berkeley; Jeffrey Wheeler, EMPA; Verena Maier, Erich Schmidt Institut; Douglas Stauffer, Hysitron

Thursday AM	Room: Oceanic 4
March 19, 2015	Location: Dolphin

Session Chair: Douglas Stauffer, Hysitron Inc.

8:30 AM Invited

Nano-Mechanical Testing in Various Conditions for Further Understanding of Materials: *Takahito Ohmura*¹; Ling Zhang¹; ¹National Institute for Materials Science

9:10 AM

Elevated Temperature Nanomechanical Testing for Late Transition Metals: *Michael Maughan*¹; Samantha Lawrence¹; Douglas Stauffer²; David Bahr¹; ¹Purdue University; ²Hysitron Incorporated

9:30 AM

Small Scale Mechanical Testing of Cu Structures at Variable Temperature: Alexander Wimmer¹; Christoph Kirchlechner²; Alexander Leitner³; Thomas Detzel⁴; Werner Robl⁴; Walther Heinz¹; *Gerhard Dehm*²; ¹Kompetenzzentrum Automobil- und Industrie-Elektronik GmbH; ²Max-Planck-Institut für Eisenforschung; ³Department Materials Physics, University of Leoben; ⁴Infineon

9:50 AM Break

10:10 AM

The Influence of High Current Densities on the Electro-Mechanical Behavior of Thin Gold Films on Polyimide: *Megan Cordill*¹; Barbara Putz¹; Oleksandr Glushko¹; ¹Erich Schmid Institute of Materials Science

10:30 AM

Design of Online, Real-Time, Non-Invasive Strain and Radiation Sensing Devices Using Novel Composite Nanomaterials: Ihor Radchenko¹; *Arief Budiman*¹; Lucas Berla²; Nobumichi Tamura³; Jian Wang⁴; William Nix²; Amit Misra⁴; ¹Singapore University of Technology and Design; ²Stanford University; ³Lawrence Berkeley National Laboratory; ⁴Los Alamos National Laboratory

10:50 AM

Hot Microhardness Testing for Rapid Assessment of Mechanical Behavior, Microstructure Evolution, and Processing Windows: John Lewandowski¹; ¹Case Western Reserve University

11:10 AM

Potentials Energy Surfaces for Broad Ranges of Environments: Steven Valone¹; Ghanshyam Pilania¹; Xiang-Yang Liu¹; Michael Baskes¹; ¹Los Alamos National Laboratory

11:30 AM

The Superelastic Response of Ni2FeGa Shape Memory Alloy Pillar: Weizhong Han¹; Lan Lv¹; Wenhong Wang²; Zhiwei Shan¹; ¹CAMP-Nano, School of Materials Science and Engineering, Xi'an Jiaotong University; ²Institute of Physics, Chinese Academy of Sciences

11:50 AM

Localized Mechanical Property Measurement of Pt and Pt-Ir-Diffusion Coatings at High Temperature: *Kazuki Kasai*¹; Dao Tue²; Hideyuki Murakami²; Douglas Stauffer³; ¹Shibaura Institute of Technology; ²National Institute for Materials Science; ³Hysitron, Inc.

12:10 PM

Microindentation Experimental Setup for Testing Thermal Barrier Coating (TBC) at 1200°C: *Jafar Albinmousa*; Lallit Anand¹; ¹Massachusetts Institute of Technology

Nanostructured Materials for Rechargeable Batteries and for Supercapacitors III — Session IX: Batteries and Supercapacitors

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee *Program Organizers*: Reza Shahbazian-Yassar, Michigan Technological University; Yan Yao, University of Houston; David Mitlin, Clarkson University

Thursday AM March 19, 2015 Room: Europe 5 Location: Dolphin

Session Chairs: Nikhil Medhekar, Monash University; Leon Shaw, Illinois Institute of Technology

8:30 AM Invited

Computational Materials Design for Next Generation Rechargeable Batteries: Nikhil Medhekar¹; ¹Monash University

8:55 AM

Free-Standing Flexible Polymer Composite Electrolyte for Li-Ion Batteries: *Amir Chamaani*¹; Meer Safa¹; Bilal El-Zahab¹; ¹Florida International University

9:10 AM

High Yield of Well-Ordered Polymer Nanopillars for Supercapacitor Applications: Zenan Yu¹; Jayan Thomas¹; ¹University of Central Florida

9:25 AM Invited

Revealing Nanoscale Heterogeneities in Phase-Separating Battery Electrodes through Operando Imaging and Phase-Field Modeling: *Yiyang Li*¹; Johanna Nelson Weker²; Farid El Gabaly³; Todd Ferguson⁴; Raymond Smith⁴; Joshua Sugar³; Norman Bartelt³; Kyle Fenton³; Daniel Cogswell⁵; William Gent¹; David Kilcoyne⁶; Tolek Tyliszczak⁶; Martin Bazant⁴; William Chueh¹; ¹Stanford University; ²SLAC National Accelerator Laboratory; ³Sandia National Laboratories; ⁴Massachusetts Institute of Technology; ⁵Samsung Advanced Institute of Technology, America; ⁶Lawrence Berkeley National Laboratory

9:50 AM Break

10:20 AM

Studies of Carbon-Encapsulated Li₂S Cathodes for Lithium Sulfur Batteries: *Lin Chen*¹; Leon Shaw¹; ¹Illinois Institute of Technology

10:35 AM

Study on Preparation of LiNi_{0.5}**Co**_{0.2}**Mn**_{0.3}**O**₂ **Precursor-Spherical Ni0.5Co0.2Mn0.3(OH)2**: Xiaolong Qu¹; *Zhengfu Zhang*¹; Hongying Hou¹; Jin Cheng¹; Xiaoyan Wang¹; ¹Kunming University of Science and Technology

10:50 AM

Nanostructured Materials for Rechargeable Batteries: Zhen Li¹; ¹Tongji University

11:05 AM

Activated Carbon-Tungsten Oxide Hybride Nanocomposite Electrodes for Supercapacitors: Aysegul Afal¹; Recep Yuksel²; *H. Emrah Unalan*¹; ¹Department of Metallurgical and Materials Engineering, Middle East Technical University; ²Department of Micro and Nanotechnology, Middle East Technical University

Nanostructured Materials for Rechargeable Batteries and for Supercapacitors III — Session VIII: Advanced Topics in Batteries and Capacitors

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee

Program Organizers: Reza Shahbazian-Yassar, Michigan

Technological University; Yan Yao, University of Houston; David Mitlin, Clarkson University

Thursday AM	Room: Europe 3
March 19, 2015	Location: Dolphin

Session Chairs: Yan Yao, University of Houston; David Mitlin, University of Alberta

8:30 AM Invited

Electrochemical Nanowires Devices for Energy Storage: *Liqiang Mai*¹; Yunlong Zhao¹; Xiaoccong Tian¹; ¹Wuhan University of Technology

8:55 AM Invited

Selected Examples of Pi-Conjugated Systems for Electrochemical Energy Storage: *Philippe Poizot*¹; Stéven Renault²; Anne-Lise Barres¹; Sébastien Gottis²; Elise Deunf¹; Franck Dolhem²; ¹University of Nantes; ²University of Picardie

9:20 AM Invited

Colossal Pseudocapacitance in a High Functionality - High Surface Area Carbon Anode Doubles the Energy of an Asymmetric Supercapacitor: *David Mitlin*¹; ¹Clarkson University

9:45 AM Invited

Structural and Chemical Analysis of Nanostructured Battery Materials Using Analytical Electron Microscopy: Judy Cha¹; ¹Yale University

10:10 AM Break

10:35 AM Invited

Chemically Integrated Graphene/Inorganic Hybrid Two-Dimensional Materials for Advanced Energy Storage: *Guihua Yu*¹; ¹The University of Texas at Austin

11:00 AM

Quantitative Tomography with X-ray Microscopy for Multiscale Li+ Battery Characterization: *Leah Lavery*¹; Jeff Gelb¹; Arno Merkle¹; ¹Carl Zeiss X-ray Microscopy, Inc.

11:20 AM

Nanocomposite Sodium Transition Metal Phosphate Prepared via Combustion Route for Hybrid Capacitor: *Manickam Minakshi*¹; ¹Murdoch University

Novel Synthesis and Consolidation of Powder Materials — Powder Production, Processing and Sintered Properties

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee Program Organizers: Ma Qian, RMIT University (Royal Melbourne

Institute of Technology); Iver E Anderson, The Ames Laboratory

Thursday AM March 19, 2015 Room: Swan 10 Location: Swan

Session Chairs: Yuncang Li, Deakin University ; Ya Feng Yang, RMIT University (Royal Melbourne Institute of Technology)

8:30 AM

Precipitation of Oxide during Water-Atomization of Fe-Cr-Y Alloy: *Chen Dai*¹; Chris Schade²; Lilia Kurmanaeva¹; Enrique Lavernia¹; Diran Apelian³; ¹University of California Davis; ²Hoeganaes Crop.; ³MPI at Worcester Polytechnic Institute

8:50 AM

Processing and Characterization of Ti-SrO Composites via Powder Metallurgy for Bone Implant Materials: Yu Wang¹; Cynthia Wong¹; Cuie Wen²; Peter Hodgson¹; Yuncang Li¹; ¹Deakin University; ²Swinburne University of Technology

9:10 AM

Particle Size and Cooling Rate Dependence on the Microstructure of Atomized Fe-Cu Particles: *Tyler Slinger*¹; Iver Anderson²; Trevor Riedemann²; ¹Ames Lab/Iowa State University; ²Ames Laboratory

9:30 AM

Influence of Magnetic Field on Dealloying of Al-15Fe Ribbons and Formation of Fe₃O₄ Octahedra: *Shi Jia*¹; Tingting Song²; Bingge Zhao¹; Quanliang Zhang¹; Qijie Zhai¹; Yulai Gao¹; ¹Shanghai University; ²RMIT University

9:50 AM Break

10:10 AM

Study on the Electromagnetic Wave Absorption Ability of CIP/Graphite Composites: Soobin Woo¹; Hwijun Kim²; Hyunjoo Choi¹; ¹Kookmin University; ²Korea Institute of Industrial Technology

10:30 AM

The Effect of Impurities on the Properties of SPS Sintered B4C: *Mohammad Asadikiya*¹; Yu Zhong¹; Christopher Rudolf¹; ¹MME Department of Florida International University

10:50 AM

Novel Processing and Characterization of Nickel-Based Oxide Dispersion Strengthened Alloys: Somayeh Pasebani¹; *Aniket Dutt*²; Indrajit Charit¹; Rajiv Mishra²; ¹University of Idaho; ²University of North Texas

THURSDAY AM
Pb-Free Solders and Emerging Interconnect and Packaging — High Temperature Lead-Free Solder and Applications

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Electronic Packaging and Interconnection Materials Committee *Program Organizers:* John Elmer, LLNL; Yan Li, Intel Corp.; Andre Lee, Michigan State University; Fan-Yi Ouyang, National Tsing Hua University; Srini Chada, Schlumberger; Kyu-Oh Lee, Intel Corp.; Kwang-Lung Lin, National Cheng Kung University; Christopher Gourlay, Imperial College; Daniel Lewis, Rensselaer Polytechnique Institute; Fan Gao, U. Masachusetts Lowell

Thursday AM	Room: Lark
March 19, 2015	Location: Swan

Session Chairs: Iver Anderson, Ames Laboratory; John Elmer, Lawrence Livermore National Laboratory

8:30 AM

Development of Pb-Free Composite Solder Paste by Liquid-Phase Diffusion Bonding for High Temperature Applications: Stephanie Choquette¹; Iver Anderson¹; ¹Ames Lab

8:55 AM

Development of Interconnection Technology for Double Side Power IC Module: *Zhu Zixuan*¹; Li C.C.¹; Liao L.L.²; Dai M.J.²; Kao C.Robert¹; ¹Department of Materials Science and Engineering, National Taiwan University; ²Electronic and Optoelectronics Research Laboratories, Industrial Technology Research Institute

9:20 AM

Investigating the Influence of Process and Service Conditions on the Microstructure of TLP Bonded Si/SiC Chips Using (Ag,Ni-)Sn Interlayers: *Adrian Lis*¹; Christian Leinebach¹; ¹Empa-Swiss Federal Laboratories for Materials Science and Technology

9:45 AM

The Performance of Solid Solution Strengthened no Silver Lead Free Solder in Elevated Temperature Service: *Takatoshi Nishimura*¹; Keith Sweatman¹; Shuhei Sawada¹; Mu Dekui¹; Kazuhiro Nogita²; Guang Zeng²; ¹Nihon Superior; ²Nihon Superior Centre for Manufacture of Electronic Materials

10:10 AM Break

10:25 AM

Al, Si Alloying Effect on Solder Joint Reliability in Sn-0.5Cu for Automotive Electronics: *Won Sik Hong*¹; A Young Kim¹; ¹Korea Electronics Technology Institutue(KETI)

10:50 AM

Sinter Joining with Shape-Controlled Silver Particles for Low Pressure-Low Temperature Die-Attach: *Shunsuke Koga*¹; Shijo Nagao¹; Jin-Ting Jiu¹; Tohru Sugahara¹; Katsuaki Suganuma¹; ¹Osaka University

11:15 AM

Ag Stress Migration Bonding: Oh Chulmin¹; Shijo Nagao¹; Tohru Sugahara¹; *Katsuaki Suganuma*¹; ¹ISIR, Osaka University

11:40 AM

Mechanical Properties after Ageing of Sintered Ag as a New Material for Die Bonding: Influence of the Microstructure Evolution: Vincenzo Caccuri¹; *Xavier Milhet*¹; Pascal Gadaud¹; Denis Bertheau¹; Michel Gerland¹; ¹Pprime Institute UPR CNRS 3346

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIV — Session III

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee

Program Organizers: Chao-hong Wang, National Chung Cheng University; Jae-Ho Lee, Hongik University; Clemens Schmetterer, Forschungszentrum Juelich, Inst. For Energy and Climate Research -2; Ikuo Ohnuma, Tohoku University; Shien Ping Feng, The University of Hong Kong; Shih-Kang Lin, National Cheng Kung University; Chih-Ming Chen, National Chung Hsing University; Yee-Wen Yen, National Taiwan University of Science and Technology

Thursday AM March 19, 2015 Room: Parrot Location: Swan

Session Chairs: Jae-Ho Lee, Hongik University; Shien Ping Feng, The University of Hong Kong

8:30 AM Invited

Nb-Doped TiO2 Mesoporous Film and Its Application in DSSCs: *Shien Ping Feng*¹; ¹The University of Hong Kong

9:00 AM

Investigation of Pt-Based Sensor Failure Induced by Phosphorous Gases: Anna Nakano¹; James Bennett¹; Jinichiro Nakano¹; ¹NETL

9:20 AM

Effects of Complexing Reagent on Electroless Nickel Iron Alloy Plating for the Diffusion Barrier of UBM: Ja-Kyung Koo¹; Sung Kang²; Jae-Ho Lee¹; ¹Hongik University; ²IBM Watson Research Center

9:40 AM

A Comparison of Solid State Reaction, Electrical Performance and Failure Mechanism of Ruthenium Schottky Contacts on 6H-SiC and 4H-SiC after Air Annealing: *Kinnock Munthali*¹; Chris Theron²; F. Danie Auret²; Sergio Coelho²; ¹University of Namibia; ²University of Pretoria

10:00 AM Break

10:20 AM

Interfacial Reactions of the Au/Sn-xZn/Cu Sandwich Structure Couples: Yi-Pin Wu¹; *Jia-Ying Dai*¹; Yee-Wen Yen¹; ¹National Taiwan University of Science and Technology

10:40 AM Invited

Effects of Additives on Electroplating of Copper in High Aspect Ratio Via Filling: Jin-Ho Rhee¹; Se-Hyun Jang¹; TaiHong Yim²; *Jae-Ho Lee*¹; ¹Hongik University; ²Korea Institute of Industrial Technology

11:10 AM

Synthesis and Characterization of Electroless Silver Plating on Multiwall Carbon Nanotube: *Ting-Chun Su*¹; Kwang-Lung Lin¹; ¹Department of Materials Science and Engineering, National Cheng Kung University

11:30 AM

Role of Interfacial Structure on the Intrinsic Growth Stresses in Metallic Thin Film Multilayers: *Li Wan*¹; Xiao-xiang Yu¹; Gregory Thompson¹; ¹The University of Alabama

11:50 AM

Ab Initio Physical and Electrochemical Properties of Kröhnkite-Type Na₂Fe(SO₄)₂:2H₂O Sulfate as Cathode for Na Ion Batteries: *Ping-chun Tsai*¹; Shih-kang Lin¹; Wen-Dung Hsu¹; ¹National Cheng Kung University (NCKU)

Phase Transformations and Microstructural Evolution — Thermal and Deformation Processing

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Soumya Nag, University of North Texas; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama ; Amy Clarke, Los Alamos National Laboratory; Frederic Danoix, CNRS - Université de Rouen; Emmanuelle Marquis, University of Michigan

Thurso	lay	AM
March	19,	2015

Room: Swan 3 Location: Swan

Session Chairs: Kester Clarke, Los Alamos National Laboratory; Paul Gibbs, Los Alamos National Laboratory

8:30 AM

In Situ Phase Transformation of Scandia-Zirconia by High Temperature X-ray Diffraction: *Maria Mora Tovar*¹; Andriy Durygin¹; Vadym Drozd¹; Selva Raju¹; Surendra Saxena¹; Yu Zhong¹; ¹Florida International University. CesMEC

8:50 AM

Metallurgical Evolution of a Highly Hydrided Zirconium Alloy Upon Cooling from High Temperature: *Isabelle Turque*¹; Matthieu Le Saux¹; Jean-Christophe Brachet¹; Jérôme Crépin²; Gilles André¹; Caroline Toffolon-Masclet¹; 'CEA; ²Mines ParisTech, Centre des Matériaux

9:10 AM

The Effect of Grain Orientation on Dissolution of Intermetallic Compounds during Electromigration in Microbumps: *Wan-Lin Hsieh*¹; Chau-Jie Zhan²; Yu-wei Huang²; Chih Chen¹; ¹National Chiao Tung University; ²Assembly and Reliability Department/EOL/ITRI

9:30 AM

Peritectoid Phase Transformations in Ni3Mo Alloy: *Ibrahim Khalfallah*¹; Alex Aning¹; ¹Virginia Tech

9:50 AM

Experimental Study and Modeling on the Grain Growth of Annealing Process in Fe-50%Ni Alloy: Zhenguo Nie¹; Gang Wang¹; Yingtao Zhang²; *Yiming (Kevin) Rong*¹; ¹Tsinghua University; ²Chongqing University

10:10 AM Break

10:30 AM

Phase Transition Research on Fe-2Mn Alloy Powders Prepared by Gas Atomization: *Yang Yang*¹; Zhengyan Shen¹; Libing Liu¹; Jianxun Fu¹; Yunhu Zhang²; Changjiang Song¹; Qijie Zhai¹; ¹Shanghai University; ²Helmholtz-Zentrum Dresden-Rossendorf

10:50 AM

Lamellae Refining in Ti-40 at%Al by Dislocations Introduced by Hot Forgin: Wei Daixiu¹; Koizumi Yuichiro¹; Chiba Akihiko¹; ¹Tohoku University

11:10 AM

Characterization of a Superplastic Forming Process with Fast Preforming: *Arnaud Giraudet*¹; Franck Tancret²; ¹IRT Jules Verne; ²Institut des Matériaux Jean Rouxel

Phase Transformations and Microstructural Evolution — Titanium Alloys

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee Program Organizers: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Soumya Nag, University of North Texas; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama; Amy Clarke, Los Alamos National Laboratory; Frederic Danoix, CNRS - Université de Rouen; Emmanuelle Marquis, University of Michigan

Thursday AMRoom: Swan 2March 19, 2015Location: Swan

Session Chairs: Soumya Nag, GE Global Research Center; Rajarshi Banerjee, University of North Texas

8:30 AM Invited

Super-refined Alpha Microstructure in Beta Titanium Alloys: *Yufeng Zheng*¹; Robert Williams¹; Soumya Nag²; Dong Wang²; Rongpei Shi¹; Yunzhi Wang¹; Rajarshi Banerjee²; Hamish Fraser¹; ¹The Ohio State University; ²University of North Texas

9:00 AM Invited

Effects of Heat Treatment Conditions on Mechanical Behavior in New Nb Modified Beta Ti-5553 Alloy: Victor Opini¹; Denis Andrade¹; Camilo Salvador¹; Eder Lopes¹; *Rubens Caram*¹; ¹University of Campinas

9:30 AM

The Role of β-phase Stability on the Microstructure Evolution of an a+β Titanium Alloy: *Jing Chen*¹; Chaoli Ma¹; ¹Beihang University

9:50 AM

Effect of Martensitic Fraction in a + a' Duplex Ti-6Al-4V ELI Microstructure on Mechanical Properties: *Juan Chafino Aixa*¹; Damien Fabregue¹; Akihiko Chiba²; ¹MATEIS - INSA Lyon; ²Deformation Processing, IMR, Tohoku University

Drying, Roasting, and Calcining of Minerals — Sintering and Energy Use

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizer: Thomas Battle, Midrex Technologies

Thursday PM	Room: Grand Harbor Salon 3
March 19, 2015	Location: Yacht & Beach

Session Chairs: Mingming Zhang, ArcelorMittal Global R&D; Dean Gregurek, RHI AG

2:00 PM

Effect of Sinter Basicity on Sinter Productivity and Quality with High Rate of Recycled Materials: *Mingming Zhang*¹; Marshall Coe²; Marcelo Andrade¹; ¹ArcelorMittal Global R&D; ²ArcelorMittal USA LLC

2:20 PM

Research on NOx Reduction by Applying Coke Breeze Pretreated with Urea Additive in Iron Ore Sintering Process: Xiaohui Fan¹; *Zhiyuan Yu*¹; Min Gan¹; Xuling Chen¹; Yusong Huang¹; Tao Jiang¹; Guanghui Li¹; ¹Central South University

2:40 PM

The Generation Ability of Liquid Phase for Mixture of Iron Ore Powders and Lime: Prediction, Characterization and Influencing Factors: Ji Changyang¹; Lv Xuewei¹; Zheng Xiangwei¹; Ding Chengyi¹; ¹Chongqing Univesity

3:00 PM

Temperature-Rise Characteristics of Silicon-Containing Chromite Ore Fines Heated by Microwave: *Kuilin Wu*¹; ¹Kunming University of Science and Technology

THURSDAY PN

3:20 PM

Development of Knowledge-Based Tools and Methods to Optimize Operating Conditions and Improve Energy Efficiency of Rotary Kiln and Electric Arc Furnaces in Ferronickel Production Plants: Anthimos Xenidis¹; Apostolos Efthymiadis²; Konstantinos Karalis¹; Nikolaos Galanis²; Georgios Antipas¹; Eirini Virvili²; ¹National Technical University of Athens; ²Technometrics Ltd

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) — Ensuring Resource Supplies with Smarter Technology

Sponsored by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Program Organizers: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory; Brian Bliss, Association for Iron and Steel Technology (AIST); Jeffrey Fergus, Auburn University; Ali Memari, Penn State University; Jonathan Motherwell, Jonathan T. Motherwell and Associates, LLC; Carol Russell, Environmental Protection Agency; Emily Sarver, Virginia Tech; Darlene Schuster, AICHE's Institute for Sustainability; Deborah Shields, Colorado State University

Thursday PM	Room: Asbury A
March 19, 2015	Location: Yacht & Beach

Funding support provided by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Session Chairs: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory

2:00 PM Introductory Comments

2:10 PM Invited

Energy-Efficient Sustainable Processes by "Thiometallurgy": *Neale Neelameggham*¹; Robert Brown²; Brian Davis³; ¹Ind LLC; ²Magnesium Assistance Group; ³Brian Davis Consultant Associates

2:35 PM

The Application Study of Voluminal Reduction on Chromite Ore Fines Containing Silicon Heated by Microwave: *Kuilin Wu*¹; ¹Kunming University of Science and Technology

3:00 PM

Polytetrafluoroethylene/TiO2 Composite Pellets as Efficient Reusable Sulfur Adsorbents for Environmental Friendly Pressure Oxidization Leaching Of Chalcopyrite: Patakamuri Govindaiah¹; Eduard Guerra¹; Yeonuk Choi¹; Zhibin Ye¹; ¹Laurentian University

3:25 PM

Removing Tin from Tin-Bearing Iron Concentrates with Sulfidation-Magnetizing Complex Roasting Process: Sang Xiuli¹; *Li Lei*¹; Wang Hua¹; ¹Kunming University of Science and Technology

3:50 PM Break

4:05 PM

Dynamic Thermal Simulation Study of Copper Slag Dilution in Direct Current Field: *Zhang Jing*¹; ¹Shanghai University

4:30 PM

Production of (Mn,Fe)-Carbide Containing Low Phosphorus by Carbothermic Reduction of Mn Oxide and Fe Oxide: *Dong-yuk Kim*¹; Hyun-soo Kim²; Sung-Mo Jung¹; ¹POSTECH, GIFT; ²POSCO

4:55 PM

Investigating Solanum Aethiopicum Leaf-Extract and Sodium-Dichromate Effects on Steel-Rebar Corrosion in Saline/Marine Simulating-Environment: Implications on Sustainable Alternative for Environmentally Hazardous Inhibitor: Joshua Okeniyi¹; Adebanji Ogbiye¹; Olubanke Ogunlana¹; Elizabeth Okeniyi¹; Oluseyi Ogunlana²; ¹Covenant University, Ota, Nigeria; ²Crawford University, Igbesa, Nigeria

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) — Innovations in Processing to Meet Emerging Demands

Sponsored by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Program Organizers: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory; Brian Bliss, Association for Iron and Steel Technology (AIST); Jeffrey Fergus, Auburn University; Ali Memari, Penn State University; Jonathan Motherwell, Jonathan T. Motherwell and Associates, LLC; Carol Russell, Environmental Protection Agency; Emily Sarver, Virginia Tech; Darlene Schuster, AICHE's Institute for Sustainability; Deborah Shields, Colorado State University

Thursday PMRoom: Asbury BMarch 19, 2015Location: Yacht & Beach

Funding support provided by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Session Chair: John Craynon, Virginia Tech

2:00 PM Introductory Comments

2:10 PM

Molecular Pump Methodology for Preparation of a Binder for Ceramic Shell Molding Process: *Bijoy Chakrabarti*¹; ¹National Institue of Foundry & Forge Technology

2:35 PM

Recycling of Molybdenum Waste Catalyst for Development of Possible Sensor Materials: Rasmita Barik¹; *Mamata Mohapatra*¹; B. Bag¹; K Sanjay¹; B. Mishra¹; ¹Institute of Minerals and Materials Technology

3:00 PM

Rare-Earth Free Permanent Magnets Sustainable for Next Generations: *Takao Suzuki*¹; Toshiya Hozumi¹; Siqian Zhao¹; Anurag Chaturvedi¹; ¹University of Alabama

3:25 PM

Removal of F and Cl from Zinc Oxide Dust by Microwave Chlorination Roasting: Zhanyong Guo¹; ¹Kunming University of Science and Technology

3:50 PM Break

4:05 PM

Wet Chemical Metallization of Aerospace Composites as a Lightning Protection Strategy: *Rajesh P S M*¹; Xavier Cauchy¹; Martin Gagne¹; Jolanta Klemberg-Sapieha¹; Frederic Sirois¹; Daniel Therriault¹; ¹Ecole Polytechnique de Montreal

4:30 PM

Photo-assisted Annealing Process of Gd-doped BiFeO3(BGFO) Thin Film: *Po-Chun Lai*¹; Chen-Ti Hu¹; Ching-Chich Leu¹; ¹National Tsing Hua University

4:55 PM

preparation and Characterization of Nanoporous Alumina Membranes : Randa Abdel-karim¹; *Alaa Faid*¹; Alyaa Mohamed¹; Hadeer Abdelhameed¹; Saad El-Raghy¹; ¹Cairo University, Faculty of Engineering

5:20 PM

Paratungstate Microwave Pyrolysis Characteristics and Characterization: *Cheng Fang*¹; ¹Kun Ming University of Science and Technology

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) — Steel: Green Manufacturing & Properties

Sponsored by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Program Organizers: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory; Brian Bliss, Association for Iron and Steel Technology (AIST); Jeffrey Fergus, Auburn University; Ali Memari, Penn State University; Jonathan Motherwell, Jonathan T. Motherwell and Associates, LLC; Carol Russell, Environmental Protection Agency; Emily Sarver, Virginia Tech; Darlene Schuster, AICHE's Institute for Sustainability; Deborah Shields, Colorado State University

Thursday PM Room: Asbury C March 19, 2015 Location: Yacht & Beach

Funding support provided by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Session Chair: Jeffrey Fergus, Auburn University

2:00 PM Introductory Comments Session Chair

2:10 PM

Green Development--The Future Direction of Chinese Steel Industry: *Chunxia Zhang*¹; Xiuping Li¹; ¹Central Iron & Steel Research Institute

2:35 PM

Optimization of Processing Conditions Leading to Dangerous Emissions in Steelmaking Plants: *Pasquale Cavaliere*¹; ¹University of Salento

3:00 PM

Review on Grain Refinement of Interstitial-Free Steel by Severe Plastic Deformation Techniques: Uma Gupta¹; Vishnu Sharma¹; Malay Banerjee¹; ¹MNIT Jaipur

3:25 PM

Engineering of Biodegradable Boron-Based, Carbon Enriched Nano Fiber and FGM Hybrid Composite Via DIMOX, Rheocasting and Thixocasting: *Bakr Rabeeh*¹; ¹German University in Cairo, GUC

3:50 PM Break

4:05 PM

Ultra-Fast Boriding and Surface Hardening of Low Carbon Steel: Bakr Rabeeh¹; ¹German University in Cairo, GUC

4:30 PM

Evaluating the Accuracy of Constitutive Models for 2.25Cr-1Mo Under Creep, Plasticity, and Thermo-Mechanical Fatigue: *Bassem Felemban*¹; Ali Gordon¹; Zachary Dyer²; ¹University of Central Florida; ²Siemens

4:55 PM

Reaction between Carbonaceous Materials Containing HDPE and Steel-Making Slag: Lan Hong¹; Huihua Wang¹; Binna Song¹; Dong Chen¹; ¹Soochow University

Materials and Fuels for the Current and Advanced Nuclear Reactors IV — Modeling

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory

Thursday PMRoom: Grand Harbor Salon 6March 19, 2015Location: Yacht & Beach

Session Chair: Mike Tonks, Idaho National Laboratory

2:00 PM

A Unified Microstructurally-Based Physical Model of Low Flux-High Fluence Irradiation Embrittlement of Reactor Pressure Steels: G. Robert Odette¹; Takuya Yamamoto¹; Peter Wells¹; ¹University of California Santa Barbara

2:20 PM

Atomistic-Informed Phase Field Model for Predicting Cr Segregation to Sinks in Irradiated Fe-Cr Alloys: *Samrat Choudhury*¹; Enrique Martinez¹; David Andersson¹; Alfredo Caro¹; Blas Uberuaga¹; Daniel Schwen²; ¹Los Alamos National Laboratory; ²Idaho National Laboratory

2:40 PM

Molecular Dynamics Simulations of Zirconium/Zirconium-Hydride Interface with the Charge Optimized Many Body (COMB) Potential: *Yongfeng Zhang*¹; Xianming Bai¹; Mark Noordhoek²; Simon Phillpot²; ¹Idaho National Lab; ²University of Florida

3:00 PM

Microstructure Evolution and Microstructure-Strength Correlation Predictions in Nuclear Materials Based on Grain Boundary Structure-Fractal Dimension Correlations: YouSung Han¹; Vikas Tomar¹; ¹Purdue University

3:20 PM

Modelling Silicide Fuel for Improved Accident Tolerance in Current and Next Generation Light Water Reactors: *Simon Middleburgh*¹; Robin Grimes²; Lars Hallstadius³; Gregory Lumpkin¹; ¹Australian Nuclear Science and Technology Organisation; ²Imperial College London; ³Westinghouse Electric AB

3:40 PM Break

4:00 PM

Energetics Associated With the Interaction between Embrittlement Species and Grain Boundaries in Alpha-Iron: *Mansa Rajagopalan*¹; Ilaksh Adlakha¹; Nitin Muthegowda¹; Kiran Solanki¹; Mark Tschopp²; ¹Arizona State University; ²Army Research Laboratory

4:20 PM

Fully Coupled Multiphysics Simulation of Fast Reactor Mixed Oxide Fuels Performance under Extreme Conditions: Rong Liu¹; *Wenzhong Zhou*¹; ¹City University of Hong Kong

4:40 PM

Phase-field Modelling of Gas Bubble Swelling and Its Impact on Thermomechanic Properties in UMo Metal Fuels: *Shenyang Hu*¹; Zhijie Xu¹; Andrew M. Casella¹; Curt A. Lavender¹; David J. Senor¹; Dean M. Paxton¹; Douglas E. Burkes¹; ¹Pacific Northwest National Laboratory

5:00 PM

Modeling the Homogenization Process for As-Cast U-10Mo: *Zhijie Xu*¹; Vineet Joshi¹; Shengyang Hu; Curt Lavender¹; Dean Paxton¹; Doug Burkes¹; ¹Pacific Northwest National Laboratory (PNNL)

2015 Functional Nanomaterials: Energy and Sensing — Poster Session

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Energy Conversion and Storage Committee

Program Organizers: Jung-Kun Lee, University of Pittsburgh; Behrang Hamadani, National Institute of Standards and Technology; Sung Hun Wee, HGST, a Western Digital Company; Nitin Chopra, University of Alabama, Tuscaloosa; Terry Xu, The University of North Carolina at Charlotte; Jang-Sik Lee, Pohang University of Science and Technology (POSTECH)

/londay PM	Room: Atlantic Hall
/arch 16, 2015	Location: Dolphin

N

F1: Quantum Oscillations from Surface State in a Topological Insulator Bi1-xSbx Nanowires: *Albina Nikolaeva*¹; Leonid Konopko¹; Tito Huber²; ¹d. Ghitu IIEN; ²Howard University

F2: Contribution to the Study of Dielectric Properties of Thin Tungsten Trioxide: Effect of Oxygen Adsorption: Marwen Hannachi¹; Mehdi Othman¹; Wajdi Belkacem¹; Fathi Jomni¹; Khalifa Aguir²; *Najeh Mliki*¹; ¹LMOP, Faculté des Sciences de Tunis, Université de Tunis El Manar; ²Aix-Marseille Université, CNRS, IM2NP (UMR 6242), France

F3: CPP-GMR of Multilayered Nanowires Electrodeposited into Anodized Aluminum Oxide Nanochannel Filters Mechanically Exfoliated from Metallic Aluminum Rods: *Kei Ishizuka*¹; Yu Zenimoto¹; Takeshi Ohgai¹; ¹Nagasaki University

F4: Effects of the Additive on Performance of Alkali Electrolyte Solution: Cheng Jin¹; *Zhang Zhengfu*¹; Hou Hongying¹; Peng Jinhui¹; Wang Xiaoyan¹; Qu Xiaolong¹; ¹Kunming University of Science and Technology

F5: Effects of Porous Carbon and CNTs on the Discharge Performance of Li-Air Batteries: *Yuxing Yan*¹; Yingjie Zhang¹; Zhengwei Xiao¹; Mingming Li¹; ¹Kunming University of Science and Technology

F6: Flame Synthesis of Nanocrystalline Indium Doped Tin Oxide Powder and Its Characterisation: John Silvister Mungara¹; Syamantak Basu¹; Subramshu Bhattacharya¹; ¹Indian Institute of Technology Madras

F7: Microwave-Assisted One Step Synthesis of Graphite-Supported Molybdenum Carbide Nanoparticles and Their Application to Electrochemical Cell: *Youngsoo Jung*¹; Bo Ding¹; Sun-Dong Kim²; Sang-Kuk Woo²; Jung-Kun Lee¹; ¹University of Pittsburgh; ²Korea Institute of Energy Research

F8: Plasmonic Nanoparticles for Solar Energy Conversion: *Salim Caliskan*¹; Jung Kun Lee¹; Hyun Soo Han²; ¹University of Pittsburgh; ²Seoul National University

F9: Preparation and Characterization of Platinum Nanoarrays by Template-Assisted AC Electrodeposition: Qu Xiao-long¹; *Zhengfu Zhang¹*; Mingli Xu¹; Hongying Hou¹; Jinhui Peng¹; ¹Kunming University of Science and Technology

F10: Semiconductor Properties of ZnTe Thin Films Electrodeposited from Aqueous Solutions: Yusaku Sugawa¹; Jun Ohta¹; Takeshi Ohgai¹; ¹Nagasaki University

F11: Cobalt Ferrite Nanoparticles Investigated by 57Fe Mössbauer Spectrometry: Mohamed Saidani¹; Wajdi Belkacem¹; Jean Marc Greneche²; *Najeh Mliki*¹; ¹LMOP, Faculté des Sciences de Tunis, Université de Tunis El Manar; ²IMMM, UMR CNRS 6283

F12: SERS Sensing Using Si-Au Nanowire Heterostructures: Yuan Li¹; *Nitin Chopra*¹; ¹The University of Alabama

F13: Modulated Thermal Conductivity of Carbon Nanotube Films: Yuan Li¹; Michael Gamble²; *Nitin Chopra*¹; ¹The University of Alabama; ²Northridge High School

F14: Heterostructures Based on Co3O4 Nanowires for Efficient Photocatalytic Organic Degradation: Yuan Li¹; Kassandra Keith¹; *Nitin Chopra*¹; ¹The University of Alabama

6th International Symposium on High Temperature Metallurgical Processing — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Gerardo Alvear, Xstratatech; Onuralp Yucel, Istanbul Technical University; Xinping Mao, Wuhan Iron and Steel Corporation; Hong Yong Sohn, University of Utah; Naiyang Ma, ArcelorMittal; Phillip Mackey, P.J. Mackey Technology; Tom Battle, Midrex Technologies

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

D1: Apparent Viscosity Measurement of Iron Particles: *Yanling Zhang*¹; Zhuoqing An¹; Qi Li¹; Zhancheng Guo¹; ¹University of Science and Technology Beijing

D2: The Phase Transformation of Bayan Obo Ore Treated with Insufficient Reductant: *GuoDing Gao*¹; Yanling Guo¹; Bingyi Bai¹; Wangjun Peng¹; Jieyu Zhang¹; ¹Shanghai University

D3: Control of the Forming Behavior of Anosovite in the Reduction of Ilmenite by Hydrogen: Yufeng Guo¹; *Pengfei Li*¹; Tao Jiang¹; Andrew Yakovlevich Travyanov²; Fuqiang Zheng¹; Guanzhou Qiu¹; ¹Central South University; ²National University of Science and Technology "MISiS"

D4: Research on Deep Reduction and Magnetic Separation of Marine Placer Based on Carbon Composite Pellet: *Liu Yiran*¹; ¹ University of Science and Technology Beijing

D5: High Temperature Interaction Between Sinter and Lump Ores/Pellet in Cohesive Zone of Blast Furnace: *Xinliang Liu*¹; Shengli Wu¹; Wei Huang¹; Jinming Zhu; ¹University of Science and Technology Beijing

D6: Fabrication of Diamond-Cu Composites by Microwave Sintering Process: Chen-long Wei¹; ¹Kunming University of Science and Technology

D7: Characteristic and Kinetics of Oxidation of Coke by CO₂ Based On Isothermal Method: Jian Guo¹; Jian-liang Zhang¹; Guangwei Wang¹; Weiwei Geng¹; Yifan Chai¹; *Bingji Yan*¹; ¹University of Science and Technology Beijing

D8: Thermodynamic Analysis of Titanium Behavior in Hot Metal and Titanium Load Foundation: *Wang Zhenyang*¹; ¹University of Science and Technology Beijing

D9: Economical Research of Dephosphorization in Single Slag Melting Process: *Lu Lin*¹; Yan-ping Bao¹; Min Wang¹; ¹University of Science and Technology Beijing

D10: Effect of Al₂O₃ on Precipitation Behavior Of Phosphorus Enrichment Phase In Dephosphorization Slag: Lu Jiang¹; *Jiang Diao*¹; Xiao-Man Yan¹; Zhen Zhang¹; Bing Xie¹; Yi Ren¹; Tao Zhang¹; ¹Chongqing University

D11: Fundamental Study of High Al₂O₃ Sinter Softening and Melting Behavior: *Fanyi Meng*¹; Wang Zhe¹; Haibin Zuo¹; ¹University of Science and Technology of Beijing

D12: Gas and Liquid Permeability of Tuyere Coke in COREX Melter Gasifier: *Wenlong Zhan*¹; Keng Wu²; Yuan She²; Jiazhi Zhang²; ¹University of Science and Technology Liaoning; ²University of Science and Technology Beijing

D13: Investigation of the Slag Forming Path on Medium Phosphorus Hot Metal Refining in BOF: *Tiancheng Lin*¹; Mingmei Zhu¹; Xiaofei Dou¹; Yu Wang¹; Bin Xie¹; Bin Zhu²; Hong Zhou²; ¹College of Materials Science and Engineering, Chongqing University; ²Chongqing Iron and Steel Group Corporation

D14: Research Progress of Iron Carburization in Blast Furnace: *Zhijia Zhang*¹; Jianliang Zhang¹; Kexin Jiao¹; ¹University of Science and Technology Beijing

D15: Study on Arsenic Removal in Molten Steel: *Luo Lingen*¹; Wang Jianjun²; Wang Lei³; Li Zhengbang¹; ¹China Iron & Steel Research Institute Group; ²Anhui University of Technology; ³University of Science and Technology Beijing

D16: Study on Crystallization Properties of Mold Flux in Magnetic Field: *Congjing Zhang*¹; Yu Wang¹; Lang Hu¹; Mingmei Zhu¹; Hongpo Wang¹; ¹Chongqing University

D17: Activities of Titanium Ions in Molten Calcium Chloride: Jianxun Song¹; *Liwen Hu*¹; Qiuyu Wang¹; Shuqiang Jiao¹; Hongmin Zhu¹; ¹University of Science and Technology Beijing

D18: The Slagging Behavior of Single Furnace Burden: *Kaifa Zhang*¹; Shengli Wu¹; Wei Huang¹; Xingliang Liu¹; ¹School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing

D19: Sulfur's Existence Form and Sulf-phase Forming Mechanism in LF Refining Waste Slag: Fang Hu¹; *GuangLiang Wu*¹; ¹Center South University

D20: Study on the Evolution of Nonmetallic Inclusions in N510L Beam Plate during Production Process: Xiang Li¹; Yanping Bao¹; Linzhu Wang¹; *Xiaobai Yan*¹; ¹University of Science and Technology Beijing

D21: The Study on Vacuum Degassing Process of AlV55 Alloy: *Jie Sun*¹; Honggang Zhong¹; Qijie Zhai¹; Yong Xian¹; Zhaohui Sun²; ¹Shanghai University; ²Pangang Group Research Institute Co.,Ltd., State Key Laboratory of Vanadium and Titanium Resources Comprehensive Utilization

D22: Deoxidation Study on V-Ti-Fe as Hydrogen Storage Alloy: *Bin Wang*¹; Jinjing Du¹; Kuiren Liu¹; Jun Zhu¹; Xiaolei Wu¹; ¹Xi'an University of Architecture and Technology

D23: Study on Damage Mechanism of Ductile Cast Iron Cooling Stave: *Cui Wang*¹; Jian-liang Zhang¹; ¹University of Science and Technology Beijing

D24: Oxidation Character of Carbon Composite Bricks Used in Blast Furnace: Haibin Zuo¹; *Cong Wang*¹; Jianliang Zhang²; Kexin Jiao²; Yongan Zhao³; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing; ²School of Metallurgical and Ecological Engineering,University of Science and Technology Beijing; ³Henan Winna Industrial Group Co. LId

D25: Application of Carbon Composite Bricks for Blast Furnace Hearth: Haibin Zuo¹; *Cong Wang*¹; Jianliang Zhang²; Yongan Zhao³; Kexin Jiao⁴; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing; ²University of Science and Technology Beijing; ³Henan Winna Industrial Group Co. LId; ⁴University of Science and Technology Beijing

D26: The Latest Developments of the Continuous Bottom-Blowing Matte Converting Process: Li Bing¹; ¹ENFI

D27: Study on the Influence of Rich Oxygen for the Properties and Structure of Castables Used in Hot Wind Pipe of Blast Furnaces: *Guotao* Xu^1 ; ¹Wuhan Iron and Steel Group Company

D28: Suitable Water Flow and Water Temperature Difference of Blast Furnace: Haibin Zuo¹; *Qian Li*¹; Jianliang Zhang¹; Meng Shen¹; Jinyan Tie¹; ¹University of Science and Technology Beijing

D29: Study on Heat Transfer of the Miniature Cooling Stave: *Fengguang Li*¹; ¹University of Science and Technology Beijing

D30: Thermal Design Method for Strures of Microwave Hot Air Reactor: *Guo Chen*¹; Jin Chen¹; Jinhui Peng¹; ¹Kunming University of Science and Technology

D31: Expert System For Grate-Kiln Oxide Pellet Thermal Process Status Control: *Xi Li*¹; Xiaohui Fan¹; Xuling Chen¹; Guiming Yang¹; ¹Center South University

D33: Study of Synthesizing Titanium Oxynitride and Testing Its Microstructure, Mechanical Properties: *Wu Jinyu*¹; Wang Qiuyu¹; Zhu Hongmin¹; Jiao Shuqiang¹; Huang Kai¹; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing, **D32: Influence of Coke Breeze Combustion Conditions on the Emission of NOX in Sintering Process:** Bo Su¹; *Sheng-li Wu*¹; Guo-liang Zhang¹; Zhi-gang Que¹; Chao-gang Hou¹; ¹School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing

Additive Manufacturing: Interrelationships of Fabrication, Constitutive Relationships Targeting Performance, and Feedback to Process Control — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; David Bourell, University of Texas at Austin; Reginald Hamilton, Pennsylvania State University; James Sears, GE Global Research Center; Allison Beese, Pennsylvania State University; Rajiv Mishra, University of North Texas

Monday PM	Room: Atlantic Hall
March 16, 2015	Location: Dolphin

A1: Finite Element Modeling of Selective Laser Melting Process Using Lattice Boltzmann Method: *Mohsen Badrossamay*¹; Abbas Ghaie¹; ¹Isfahan University of Technology

A2: Microstructures of Inconel 718 Produced by Selective Laser Melting: *Xibing Gong*¹; Kevin Chou¹; ¹The University of Alabama

A3; Out of the Box Printing Compared to Conventional Powder Method Printing of Inconel 718: *Taylor Waters*¹; ¹Mississippi State University

A4: Studies on Temperatures Involved in Multi Layered Friction Assisted Additive Manufacturing Method: Javed Akram¹; *James Samuel*¹; Sekhar Rakurty¹; Prasad Kalvala¹; Mano Misra¹; ¹University of Utah

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Shaping and Forming Committee, TMS: Materials Characterization Committee *Program Organizers:* Rodney McCabe, Los Alamos National Laboratory; John Carpenter, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Marko Knezevic, University of New Hampshire; Khalid Hattar, Sandia National Laboratory; Irene Beyerlein, Los Alamos National Laboratory; Wolfgang Pantleon, Technical University of Denmark

Monday PMRoom: Atlantic HallMarch 16, 2015Location: Dolphin

B1: A Statistical Dislocation Source Model to Study the Deformation Behavior of Nanocrystalline Ni: *Caizhi Zhou*¹; Rui Yuan¹; Irene Beyerlein²; ¹Missouri University of Science and Technology; ²Los Alamos National Laboratory

B2: An In-Situ Transmission Electron Microscopy Study of TiNi-(Hf) Alloys with Precipitates: *Seong-Woong Kim*¹; Chan Hee Park¹; R.V.S. Prasad¹; Jae Keun Hong¹; Jong Taek Yeom¹; Hyun-Gyu Kim²; ¹Korea Institute of Materials Science (KIMS); ²Seoul National University of Science and Technology

B3: Characterizing Pseudoelasticity of NiTi Based SMA by Nanoindentation: *Indrani Sen*¹; Martin Wagner²; ¹Indian Institute of Technology, Kharagpur, India; ²Chemnitz University of Technology, Germany

B4: Construction of Representative Volume Element for FE Simulation of Bulk Deformation of Stainless Steel Using X-ray Computed Tomography Approach: Xian Zheng Lu¹; Luen Chow Chan¹; ¹The Hong Kong Polytechnic University B5: Crystallographic Orientation and Boundary Effects on Misorientation Development in Austenitic Stainless Steel: Prita Pant¹; Shanta Chakrabarty¹; Sushil Mishra¹; *Harshavardhana Natarajan*¹; ¹Indian Institute of Technology Bombay

B6: Deformation and Tearing of Large Two-Dimensional Nanosheets: *Wade Lanning*¹; Christopher Muhlstein¹; ¹Georgia Institute of Technology

B7: Deformation Twinning Behavior in Precipitate Strengthened Cu-Ni-Si Alloys: *Akiyoshi Araki*¹; Equo Kobayashi¹; Tatsuo Sato¹; Warren Poole²; ¹Tokyo Institute of Technology; ²The University of British Columbia

B8: Estimation of Strain-Hardening Characteristics of Electro-Plated Copper Film Using Nanoindentation: Si-Hoon Kim¹; *Young-Cheon Kim¹*; Ju-Young Kim¹; ¹UNIST (Ulsan National Institute of Science and Technology)

B9: Indentation Response and Structure-Property Correlations for Primary and Secondary a Phases in Bimodal Ti-6Al-4V: Indrani Sen¹; *Shibayan Roy*²; Martin Wagner²; ¹Indian Institute of Technology Kharagpur, India; ²Chemnitz University of Technology

B10: Quantifying Nanoindentation Deformation Processes Near Grain Boundaries in Alpha-Titanium Using Microscopic Characterization and Crystal Plasticity Modeling: *Yang Su*¹; Claudio Zambaldi²; David Mercier²; Philip Eisenlohr¹; Thomas Bieler¹; Martin Crimp¹; ¹Michigan State University; ²Max Plank institute for iron research

B11: The Effect of Thickness on Flow Properties of Monocrystalline Au Film Measured by In-Situ Nano-Tensile Testing: *Young-Cheon Kim*¹; Ju-Young Kim¹; ¹UNIST (Ulsan National Institute of Science and Technology)

B12: Deformation Evolution in a Polycrystalline Nickel Superalloy Under Cyclic Loading by High Resolution EBSD and Digital Image Correlation: *Tiantian Zhang*¹; Jun Jiang¹; Ben Britton¹; Barbara Shollock²; Fionn Dunne¹; ¹Imperial College London; ²University of Warwick

B13: Residual Stress Determination and Flaw Detection Using Electronic Speckle Pattern Interferometry: *Pawan Maharjan*¹; Jahan Rasty¹; Mike Steinzig²; ¹Texas Tech University; ²Los Alamos National Laboratory

B14: Stress-Strain Behavior of Elevated Temperature Using Instrumented Indentation and the Finite Element Method: *Jae Ik Yoon*; Hyeok Jae Jeong; Seong-Hoon Kang¹; Ho Lee¹; Hyoung Seop Kim²; ¹Korea Institute of Materials Science (KIMS); ²POSTECH

B15: The Effect of Grain Size of Precursor Alloy on Mechanical Behavior of Nanoporous Gold: Eun-Ji Gwak¹; Ju-Young Kim¹; ¹UNIST

B16: A Model Correlating Deformation and Crystallographic Orientations of Titanium: *Ashish Kumar*¹; Prita Pant¹; Asim Tewari¹; ¹Indian Institute of Technology, Bombay, Mumbai

B17: Design and Assessment of a Test Platform for Advanced Simulation of Cyclic Thermo-Acousto-Mechanical Loading: *Abdi Jasmin*¹; Michael Sedlack¹; Philip Lavandera¹; Ali Gordon¹; Ravi Penmetsa²; ¹University Of Central Florida; ²United States Air Force Research Laboratory

B18: Hot Rolling Simulation of Steel Long Products: *Karina Montemayor*¹; Patricia Zambrano¹; Luis Leduc¹; Oscar Zapata¹; ¹FIME

B19: Predicted Composition and Structural Effects on the Mechanical Responses of Aluminum Based Systems: *Kamal Choudhary*¹; Tao Liang¹; Aleksandr Chernatynskiy¹; Zizhe Lu¹; Simon Phillpot¹; Susan Sinnott¹; ¹University of Florida

B20: Prospects for Single Vacancy Detection in Bulk Material by Scanning Transmission Electron Microscopy: *Jie Feng*¹; Andrew Yankovich¹; Dane Morgan¹; Paul Voyles¹; ¹University of Wisconsin Madison

B21: Study on Tensile Behaviors of Al-Killed Steel Under Batch-Annealed and Continuous-Annealed Conditions: *Zhengyan Shen*¹; Libing Liu¹; Yang Yang¹; Yunhu Zhang²; Changjiang Song¹; Jianxun Fu¹; Qijie Zhai¹; ¹Shanghai Key Laboratory of Modern Metallurgy & Materials Processing, Shanghai University; ²Helmholtz-Zentrum Dresden-Rossendorf

B22: TEM Characterization of Impact-Induced Microstructural Features in Boron Carbide: *Jerry LaSalvia*¹; Scott Walck¹; Kelvin Xie²; Vladislav Domnich³; ¹U.S. Army Research Laboratory; ²Johns Hopkins University; ³Rutgers University

Advanced Composites for Aerospace, Marine, and Land Applications II — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Tomoko Sano, US Army Research Laboratory; Tirumalai Srivatsan, The University of Akron

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

C1: Basic Research on the Oxidation Mechanism of C/C-SiC Composite: Roberson J. Silva¹; *Gilberto Petraconi*¹; Alexei M. Essiptchouk¹; Leonid I. Charakhovski¹; ¹Instituto Tecnológico de Aeronáutica

C2: Effect of T6 Treatment on the Hardness of Carbon Nanotube-Reinforced AA6061 Aluminium Alloy Matrix Composites: *Dilermando Travessa*¹; Matheus Pianassola¹; Mirian Carneiro¹; Marcela Lieblich²; ¹Federal University of Sao Paulo; ²CENIM - CSIC

C3: Fabrication and Extrusion of CNTs/Mg-6Zn Matrix Composites: Xiaojun Wang¹; ¹Harbin Institute of Technology

C4: Mechanical Properties of Ni-5Al-Graphene Plasma Sprayed Coatings: David Ward¹; Sudipta Seal¹; Ankur Gupta¹; Shashank Saraf¹; ¹University of Central Florida

C5: Modeling Multiphysial Processes in Ferroelectric Ceramic-Reinforced Metal-Matrix Composites: *Yongmei Jin*¹; Zachary Morgan¹; Stephen Kampe¹; ¹Michigan Technological University

Advanced Materials in Dental and Orthopedic Applications — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Elizabeth Trillo, Southwest Research Institue; Grant Crawford, South Dakota School of Mines and Technology

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

Session Chairs: Terry Lowe, Colorado School of Mines; Grant Crawford, South Dakota School of Mines and Technology

J1: Deposited Layer Thickness and the Corrosion Resistance Behavior of 316L Stainless Steel by Ti Coated: *Walman Castro*¹; Leopoldo Batista Neto¹; André Soares¹; ¹Universidade Federal de Campina Grande

J2: Obtaining Self-Organized Nanotubes on Biomedical Ti-Mo Alloys: Nilson Oliveira¹; Julia Verdério¹; Claudemiro Bolfarini¹; ¹DEMa - Universidade Federal de São Carlos - UFSCar - São Carlos - Brazil

J3: Effect of Niobium on the Electrochemical Behavior of a New Beta Ti Alloy System with Low Elastic Modulus: *José Roberto Martins Jr*¹; Isolda Costa²; Luís Augusto Sousa Marques da Rocha¹; Carlos Grandini¹; ¹UNESP; ²IPEN

J4: Effect of Sn Addition on Phase Transformations and Mechanical Properties in Ti-Mo System: Mariana Mello¹; Rubens Caram¹; ¹UNICAMP University of Campinas

J5: Synthesis of Bioactive Coating Formed on Biodegradable Magnesium Implants via One-Step Process of Plasma Electrolytic Oxidation: Yeon Sung Kim¹; Ki Ryong Shin¹; Kang Min Lee¹; Young Gun Ko²; Dong Hyuk Shin¹; ¹Hanyang University; ²Yeungnam University

J6: Thermal and Mechanical Characterization of Nano Hydroxyapatite/ Poly(hydroxybutyrate) Composite for Odontological Application: *Teresa Castillo*¹; Yam Yucif Azevedo Maia¹; Lucivan Barros Júnior¹; Leila Barreto¹; Ruben J. Rodriguez¹; ¹Universidade Estadual do Norte Fluminense

J7: Comparing Biologically Compatible Solvents Used to Adhere a Bioactive Coating to Titanium: *Kathryn Shields*¹; Holly Martin¹; ¹Youngstown State University

J8: Formation of Hierarchically Structured Macroporous Hydroxyapatite Scaffolds via Polystyrene Particle Templates for Bone Grafting: *Shannon Oscher*¹; Tara Nylese¹; Travis Rampton¹; Matt Noel¹; ¹EDAX

J9: Evolution of Cold-rolled Microstructure and Mechanical Properties of Biomedical Co-Cr Alloys: *Manami Mori*¹; Kenta Yamanaka²; Akihiko Chiba²; ¹Sendai National College of Technology; ²Tohoku University

J10: The Effect of Heat Treatments on the Mechanical Properties of Chill Cast Co-20 wt. %Cr Alloy: *Marco Aguilar- Mendez*¹; Ana Ramirez-Ledesma¹; Julio Juarez-Islas¹; ¹Universidad Nacional Autonoma de Mexico

J11: Elastic Modulus of Oxidized Ti-Nb Alloys: *Neide Kuromoto*¹; Hebert Sato¹; Douglas Valerio¹; Pedro Bazaglia¹; Carlos Lepienski¹; Adriano Scheid¹; Carlos Grandini¹; ¹Universidade Federal do Paraná

J12: Effect of Aging on the Microstructure and Selected Mechanical Properties of Ti-15Zr-Mo Alloys for Use as Biomaterial: Diego Correa¹; Mariana Lourenço¹; Pedro Kuroda¹; *Carlos Grandini*¹; ¹UNESP – Univ Estadual Paulista, Laboratório de Anelasticidade e Biomateriais

J13: Effects of Aging Heat Treatment on Mechanical Behavior of Beta Ti-Mo Alloys: Mariana Mello¹; Flavia Cardoso¹; Alessandra Cremasco¹; Eder Lopes¹; *Rubens Caram*¹; ¹University of Campinas

Advances in Thin Films for Electronics and Photonics — Poster Session

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee

Program Organizers: Federico Rosei, INRS; Nuggehalli Ravindra, New Jersey Institute of Technology; Amit Pandey, Rolls Royce LG Fuel Cell Systems Inc.; Terry Alford, Arizona State University

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

Session Chair: Alberto Vomiero, CNR Brescia

F15: Effect of Cr Doping on the Structural, Morphological, Optical and Electrical Properties of Indium Tin Oxide Films: *Majid Mirzaee*¹; Abolghasem Dolati¹; ¹Sharif University of Technology

F16: Effect of Different Substrates on the Morphology and Stability of the Au Thin Films Deposited by Sputtering: Aritra Dhar¹; *Zhao Zhao*¹; Terry Alford¹; ¹Arizona State University

F17: Effect of Electric Field Density on Atom Diffusion in Cu/Ta/Si Stacks: *Lei Wang*¹; Jun hua Xu¹; Li hua Yu¹; Song tao Dong¹; ¹Jiangsu University of Science and Technology

F18: Effect of Gold Thickness and Annealing on Optical and Electrical Properties of TiO₂/Au/TiO₂ Multilayers as Transparent Composite Electrode on Flexible Substrate: Aritra Dhar¹; *Zhao Zhao*¹; Terry Alford¹; ¹Arizona State University

F19: HMDS Modified ITO in P3HT:PC61BM Bulk Heterojunction Organic Solar Cell Structures: *Sayantan Das*¹; Joseph Joslin¹; Terry Alford¹; ¹Arizona State University

F20: Investigation of Ag Mid-Layer Thickness on the Optoelectrical Properties of ZnO/Ag/MoOx Transparent Composite Electrodes and their Use in P3HT:PC61BM Based Organic Solar Cells: Sayantan Das¹; Hyung Choi¹; Terry Alford¹; ¹Arizona State University

F21: Nanoarchitectured Tin-Oxide Arrays Enhances Hydrogen Sensing at Room Temperature: Rameech McCormack¹; Nozomi Shirato²; Umesh Singh³; Soumen Das⁴; Amit Kumar¹; Hyoung J. Cho³; Ramki Kalyanaraman⁵; Sudipta Seal⁶; ¹UCF/AMPAC; ²MSE/UTK; ³UCF/MMAE; ⁴UCF/NSTC; ⁵UTK/SEERC/MSE; ⁶UCF/NSTC/AMPAC **F22: Mechanical Properties of Graphene Nanosheets and Nanoribbons**: Biao Leng¹; *Sarang Muley*; Yan Liu¹; Nuggehalli Ravindra; ¹New Jersey Institute of Technology

F23: Optimization of Different Thickness and Annealing of Amorphous Indium Gallium Zinc Oxide Transparent Thin Films on Flexible Substrates: Aritra Dhar¹; Zhao Zhao¹; Terry Alford¹; ¹Arizona State University

Aluminum Alloys: Development, Characterization, and Applications — Poster Session

Sponsored by: TMS Light Metals Division, TMS: Aluminum Processing Committee Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix,LLC; Tongguang Zhai, University of Kentucky

Monday PMRoom: Atlantic HallMarch 16, 2015Location: Dolphin

H1: A Study on Anisotropy Behavior of AA6K21/AA7075/AA6K21

Composite Sheet Metals: *Min-Seong Kim*¹; SooHyun Kim²; Hyung-Wook Kim²; Shi-Hoon Choi¹; ¹Suncheon National University; ²Korea Institute of Materials Science

H2: Effect of Al-Ti-B Grain Refiners on the Microstructure and Mechanical Properties of Al-Mg-Si Alloys with Zr Addition: *Matej Steinacher*¹; Peter Cvahte²; Franc Zupanic¹; ¹University of Maribor, Faculty of Mechanical Engineering; ²Impol Aluminium Industry

H3: Effect of Titanium on Dross Formation in Hot-Dip 55%Al-Zn-Si-La Bath: *Qin Li*¹; Qian Li¹; Kuo Chou¹; ¹Shanghai University

H4: Effects of Pouring Rate and Melt Temperature on the Shrinkage of A356.2 Alloy Casting: *Kyeong-Wook Min*¹; Ki-Young Kim¹; ¹Korea University of Technology and Education

H5: Influence of Retrogression and Reaging Treatment on Stress Corrosion Cracking Behaviour of 8090 Al-Li-Cu-Mg and 7150 Al-Zn-Mg-Cu Alloys: *K S Ghosh*¹; M M Ghosh¹; Prasanta Rout¹; ¹National Institute of Technology (NIT) Durgapur, India

H6: Measurement of Elastic Stress and Plastic Strain from Ultrasonic Impact Treatment of Aluminum-Magnesium Alloys: *Luke Brewer*¹; Eid Fakhouri¹; Kim Tran²; ¹Naval Postgraduate School; ²Naval Surface Warfare Center Carderock Division

H7: Microstructure Evolution of Aluminum Alloys Enhanced by Zirconium Addition Studied by Electron Microscopy: Michaela Poková¹; Miroslav Cieslar¹; Mariia Zimina¹; ¹Charles University in Prague, Faculty of Mathematics and Physics

H8: Nanoscale Precipitation-Strengthened Al-Sc-(V,Nb,Ta) Alloys: *Keith Knipling*¹; Nhon Vo²; David Dunand³; David Seidman³; ¹Naval Research Laboratory; ²NanoAl LLC; ³Northwestern University

H9: Nickel Coatings with Submicrometric Hard Ceramic Particles on Aluminum Alloys: *Marek Nowak*¹; Anna Kozik¹; Michal Karas¹; Sonia Boczkal¹; Maciej Gawlik¹; ¹Institute of Non Ferrous Metals in Gliwice

H10: Study on Microstructure and Mechanical Properties of High Mg Content Al-Si Alloy as an In-Situ Composite: *Azin Akbari*¹; Hennadiy Zak²; Olga Zak²; Babette Tonn²; ¹Case Western Reserve Univ; ²Clausthal University of Technology

H11: The Effect of Cooling Rate and Cerium Melt Treatment on Thermal Analysis Parameters and Microstructure of Hypoeutectic Al-Si Alloy: *Vijeesh Vijayan*¹; K Prabhu²; ¹NITK ; ²NITK

H12: The Effect of Cryogenic Treatment on the Surface Roughness of Age Hardenable Aluminium Alloys and Die Materials: Chandrashekhar Gogte¹; *Ajay Likhite*²; Milind Dhobe³; Sachin Lomte¹; Dilip Peshwe²; ¹Marathwada Institute of Technology; ²Visvesvaraya National Institute of Technology; ³PES College of Engineering H13: The Effect of TiH2 Oxidation Treatment on Preparing Aluminum Foam Sandwiches: *Binna Song*¹; Shunhu Zhang¹; Lan Hong¹; Jixin Hou¹; Guoyin Zu²; ¹Soochow University; ²Northeastern University

H14: The Effects of Various T4 Temperatures on Microstructures and Tensile Properties of 7001 Aluminum Alloy: Yu Ting Li¹; ¹National Chang Kung University

H15: The Influence of Alloying Additions on Interaction of Aluminum Alloys with Aqueous Media: Alexander Baimakov¹; Sergey Petrovich¹; Vadim Lipin²; Alexander Shahmin¹; *Rustam Seytenov³*; ¹Saint Petersburg State Polytechnical University; ²Saint Petersburg State Polytechnical University; ³Outotec CIS

H16: Study on Inhibitors of Copper and Copper-Nickel Alloy in LiBr Solution: *Xinglan Hu*¹; ¹Tianjin Vocational Institute

H17: Optimization of Casting Conditions in Twin-roll Casting of Al-Mg Alloys using Finite Element Modelling: *Min-Seok Kim*¹; Y. Lee¹; J. Cho¹; H. Kim¹; C. Lim¹; ¹Korea Institute of Materials Science (KIMS)

H18: Influence of Process Parameters on Localized Corrosion of Al 7075 Alloy during the Production of Aeronautic Components: *Maria Ismenia Faria*¹; Alain Robin¹; Luciana Prisco²; Julio César Lourenço¹; Mário Coelho³; ¹EEL-USP; ²PUC-Rio; ³Liebherr-Aerospace Brasil

Biological Materials Science Symposium — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Kalpana Katti, North Dakota State University; Rajendra Kasinath, DePuy Synthes Products, LLC; Michael Porter, Clemson University; Francois Barthelat, McGill University

Monday PM March 16, 2015

Room: Atlantic Hall Location: Dolphin

Session Chairs: Francois Barthelat, McGill University; Rajendra Kasinath, DePuy

F24: The Investigation of Wear Resistance of Hydroxyapatite-chitosan Bio Composite Coating on Stainless Steel 316L: *Sajjad Falaki*¹; Rana Sabouni Tabari¹; Seyyed Khatiboleslam Sadrnezhaad¹; ¹Sharif University of Technology

F25: Toughening Mechanisms in Nacre: *Sina Askarinejad*¹; Nima Rahbar¹; ¹Worcester Polytechnic Institute

F26: Microstructural Analysis of Aristotle's Lantern in Sea Urchins: *Michael Frank*¹; Kirk Sato¹; Jennifer Taylor¹; Lisa Levin¹; Joanna McKittrick¹; ¹University of California San Diego

F27: Surface Magnetized Colloidal Particles Aligned by Magnetic Freeze Casting: *Michael Frank*¹; Michael Porter¹; Steven Naleway¹; Tsuk Haroush¹; Joanna McKittrick¹; ¹University of California San Diego

F28: MoS2-Ceria Hybrid Nano-composite Based Electrochemical Biosensor: *Ankur Gupta*¹; Soumen Das¹; Sudipta Seal¹; ¹University of Central Florida

F29: Advances in the Understanding of the Effects of External Treatments on the Subcellular Structure and Composition of Plant Cell Walls: *Mikhael Soliman*¹; Laurene Tetard¹; ¹University of Central Florida

F30: Amperometric Detection of Hydrogen Peroxide by Ceria Nanoparticle-Functionalized Self-Assembled Monolayer Biosensor: Craig Neal¹; Shashank Saraf¹; Sanghoon Park²; Soumen Das¹; Hyoung Cho²; Sudipta Seal¹; ¹AMPAC; ²University of Central Florida

F31: Regenerative Nanoporous Gold Biosensor in Harsh Biofouling Conditions: *Shashank Saraf*¹; Craig Neal¹; Sangoon Park¹; Soumen Das¹; Sudipta Seal¹; Hyoung Cho¹; ¹University of Central Florida F32: Dynamic Modeling Approach to Follow Adsorption Kinetics of Engineered Proteins that Self-assembles Through Biomolecular Recognition: James Meyer¹; Viraj Singh¹; Banu Taktak Karaca¹; Paulette Spencer¹; Anil Misra¹; Candan Tamerler¹; ¹University of Kansas

F33: Single Step Biofabrication of Self-Organized Hybrid Molecular Assemblies: *Banu Taktak Karaca*¹; Ryan Maloney¹; Dwigth Deay¹; Brandon Tomas¹; Mark Richter¹; Candan Tamerler¹; ¹University of Kansas

F34: Towards Amperometric Sensors via Self Assembled Metal-specific Enzymes: *Dwigth Deay*¹; Brandon Tomas¹; Ryan Maloney¹; Candan Tamerler¹; Mark Richter¹; ¹University of Kansas

F35: Easing the Fabrication of Bioinspired Composites Through the use of Clathrate Hydrates in Freeze Casting: *Steven Naleway*¹; Yi-Husan Hsiao¹; Michael Porter¹; Marc Meyers¹; Joanna McKittrick¹; ¹University of California, San Diego

F36: Microstructure, Mechanical Property of Porous Hydroxyapatite-ß TCP Biomaterial Consolidated by Rapid Sintering using Space Holder: *Kee-Do Woo*¹; Tack Lee¹; Hae-Cheol Lee¹; Seong-Tak Oh¹; ¹Chonbuk National University

F37: Silk Fibroin Bio-Polymer Integrated Nanostructures for Energy/ Sensing Applications: *Swetha Barkam*¹; Corey Rodas¹; Anh Ly¹; Rameech McCormack¹; Sudipta Seal¹; ¹University of Central Florida

F38: The Ganoid Scales of Atractosteus spatula: Potential for Bioinspired Flexible Armor: *Vincent Sherman*¹; Wen Yang²; Robert Ritchie³; Marc Meyers¹; ¹Materials Science and Engineering Program, University of California, San Diego; ²Complex Materials, ETH Zürich; ³Lawrence Berkeley National Laboratory

F39: Response of Osteoblast-Like Cells to Titanium Alloying Elements: *Dongmei Zhang*¹; Cynthia Wong¹; Peter Hodgson¹; Yuncang Li¹; ¹Deakin University

F40: Comparisons of Apetite Deposition on the Surface of Titanium and Ti6Al4V Alloy Powders: *Elif Yent*¹; Ziya Esen²; Servet Turan¹; ¹Anadolu University; ²Cankaya University

Bulk Metallic Glasses XII — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Hahn Choo, Univ of Tennessee; Yanfei Gao, Univ of Tennessee

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

F56: Bending Fracture Behavior of an As-Spun Al-Based Partial Amorphous Thick Ribbon: *Hongwang Yang*¹; ¹Shenyang University of Technology

F57: Brazing and Interfacial Reaction of Titanium Using Zr-Ti-Cu-Ni Bulk Metallic Glass Fillers: Jun Hyeok Lee¹; Min Hong¹; Chae Hong Lee¹; *Jin Kyu Lee*²; ¹Kongju National University; ²Kongju National University

F58: Characterization and Electrical Properties of Pulverized Al-Based Metallic Glass Powder Included Ag Electrode: Jin Man Park¹; Kuem Hwan Park¹; Eun Soo Park¹; Seokmoo Hong¹; Jürgen Eckert²; Won Tae Kim³; Do Hyang Kim⁴; ¹Global Technology Center(GTC), Samsung Electronics Co., Ltd; ²IFW Dresden; ³ Cheongju University; ⁴Yonsei University

F59: The Kinetic Behavior of Metallic Glass Suppercooled Liquid in the High Temperature Region: *Jiahao Yao*¹; Yi Li¹; Fengxia Bai¹; ¹Institute of Metal Research, Chinese Academy of Sciences

F60: Correlations between Dynamics and Atomic Structures in Cu-Zr Metallic Glass: *Yue Zhang*¹; Caizhuang Wang¹; Feng Zhang¹; M. I. Mendelev¹; M. J. Kramer¹; K. M. Ho¹; ¹Ames Laboratory **F61: Development of Cu-Zr-Al-RE (Rare-Earth) Bulk Metallic Glasses:** *Ilkay Kalay*¹; Fatih Sikan²; Eren Kalay²; ¹Cankaya University; ²METU

F62: Effect of Load and Annealing Temperature on the Deformation in Al-Based Metallic Glass: *Rina Sahu*¹; Kanai Sahoo²; ¹NIT JAMSHEDPUR; ²CSIR- NML Jamshedpur

F63: Excellent Mechanical and Magnetic Properties of Cobalt-Iron Metallic Glasses: *Santanu Das*¹; Harpreet Arora¹; Sundeep Mukherjee¹; Medha Veligatla¹; ¹University of North Texas

F64: Experimental Determination of TTT Diagrams of Zr-Based Glass Forming Alloys: *Stefanie Koch*¹; Dieter M. Herlach¹; Peter Galenko²; Markus Rettenmayr²; ¹German Aerospace Center, Ruhr University Bochum; ²Friedrich-Schiller-University Jena

F65: In-Situ Electrochemical Testing during Deformation of Bulk Glassy Zr_{52.5}Cu_{17.9}Al₁₀Ni_{14.6}Ti₅ Alloy: A Sensitive Tool Revealing Early Shear Banding: *Daniel Grell*¹; Petre Gostin²; Annett Gebert²; Eberhard Kerscher¹; ¹TU Kaiserslautern; ²IFW Dresden

F66: In Situ Neutron Diffraction Studies of the Deformation-Induced Phase Transformation in Ti-Based Amorphous Alloy Composites: *Juan Mu*¹; Yandong Wang¹; Haifeng Zhang²; ¹Northeastern University; ²Institute of Metal Research

F67: Influence of Chemical Composition and Thermal Treatments on the Mechanical Properties of Bulk Metallic Glasses Based on Precious Metals: Sandrine Cardinal¹; Jean-Marc Pelletier¹; Jichao Qiao¹; ¹INSA

F68: Influence of Pd Addition on the Wettability of Amorphous TiCuZrPd Alloys Used as a Filler during the Brazing Process: *Anna Sypien*¹; Przemyslaw Fima¹; ¹Institute of Metallurgy and Materials Science

F69: Mechanical Behavior of an Fe-Based Structural Amorphous Metal with W Nanoparticle Additions: *I-Chung Cheng*¹; James Kelly²; Olivia Graeve²; Andrea Hodge¹; ¹University of Southern California; ²University of California, San Diego

F70: Refining the Predictions for Glass Forming Ability in the Ni-Nb-Zr System by Characterization of Metastable Crystalline Phases: *Leonardo Deo*¹; Michael Kaufman²; M. F. de Oliveiraa¹; ¹University of de São Paulo; ²Colorado School of Mines

F71: Rejuvenation of Metallic Glasses Induced by Thermal and Pressure Loading: *Masato Wakeda*¹; Narumasa Miyazaki¹; Shigenobu Ogata¹; ¹Osaka University

F72: Ti-Based Ti-Cu-Zr-Fe-Sn-Si-Ag Bulk Metallic Glasses as Potential Biomaterials: *Ying Liu*¹; Shujie Pang¹; Tao Zhang¹; ¹Beihang University

Bulk Metallic Glasses XII — Student Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; Hahn Choo, Univ of Tennessee; Yanfei Gao, Univ of Tennessee

Monday PM	Room: Atlantic Hall
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F41: A Simple Parameter for Evaluating Thermoplastic Formability in the Newtonian Viscous Flow Regime: *Hyun Seok Oh*¹; Chae Woo Ryu¹; Eun Soo Park¹; Juil Yoon²; ¹Seoul National University; ²Hansung University

F42: Atomic Scale Characterization of Shock-Induced Changes in Ce-Al Metallic Glass: *Alex Bryant*¹; Faisal Alamgir¹; Jonathan Poplawsky²; Christopher Wehrenberg³; Erik Farquhar⁴; Wenqian Xu⁴; Michael Miller²; Bruce Remington³; Naresh Thadhani¹; ¹Georgia Institute of Technology; ²Oak Ridge National Laboratory; ³Lawrence Livermore National Laboratory; ⁴Brookhaven National Laboratory **F43:** Connecting Liquid Structure and Glass Forming Ability with Molecular Dynamics Simulations: *David Riegner*¹; Logan Ward²; Kathy Flores³; Wolfgang Windl¹; ¹The Ohio State University; ²Northwestern University; ³Washington University in St. Louis

F44: Cyclic Hardening in Metallic Glasses: A Study Based on Shear **Transformation Zone Dynamics Simulations**: *Neng Wang*¹; Lin Li¹; ¹University of Alabama

F45: Dendrite Size and Tensile Ductility in Ti-Based Dendrite-Containing Amorphous Alloys Modified from Ti-6Al-4V Alloy: *Hyungsoo Lee*¹; Changwoo Jeon¹; Choongnyun Kim¹; Soo-Hyun Joo¹; Hyoung Seop Kim¹; Sunghak Lee¹; ¹Center for Advanced Aerospace Materials, POSTECH

F46: Dynamic Mechanical Behavior of Titanium-Based Bulk Metallic Glass Composites: *Rene Diaz*¹; Manny Gonzales¹; Christopher Lo¹; Greg Kennedy¹; Douglas Hofmann²; Naresh Thadhani¹; ¹Georgia Institute of Technology; ²NASA Jet Propulsion Laboratory/California Institute of Technology

F47: FFT Modeling of Deformation Behavior in Metallic Glass Matrix Composites: *Michael Gibbons*¹; David Riegner¹; Kelly Kranjc²; Nicholas Hutchinson¹; Allen Hunter³; Douglas Hofmann⁴; Jennifer Carter⁵; Emmanuelle Marquis³; Katherine Flores²; Stephen Niezgoda¹; Wolfgang Windl¹; ¹The Ohio State University; ²Washington University in St. Louis; ³University of Michigan; ⁴Jet Propulsion Laboratory; ⁵Case Western Reserve University

F48: Fracture Toughness of Thermoplastically Formed Metallic Glasses: *Wen Chen*¹; Jittisa Ketkaew¹; Ze Liu¹; Jan Schroers¹; ¹Yale University

F49: High-Throughput Characterization of the Formability of Metallic Glass Libraries: *Yanglin Li*¹; Yanhui Liu¹; Ze Liu¹; Ellen Scanley²; Christine Broadbridge²; Jan Schroers¹; ¹Yale University; ²Southern Connecticut State University

F50: High Density Ni-Based Metallic Glasses Formed by Spark Plasma Sintering: *Henry Neilson*¹; G Shiflet²; Alex Peterson³; S Poon³; John Lewandowski¹; ¹Case Western Reserve University; ²Carnegie Mellon University; ³University of Virginia

F51: Mechanical Rejuvenation in a Zr-Based Bulk Metallic Glass Induced by Thermo-Creep: *Yang Tong*¹; W Dmowski¹; Y Yokoyama²; T Egami¹; ¹The University of Tennesee-Knoxville; ²Tohoku University

F52: Novel Biodegradable Mg-Based Bulk Metallic Glasses for Biomedical Applications: *Haifei Li*¹; Shujie Pang¹; Peter Liaw²; Tao Zhang¹; ¹Beihang University; ²The University of Tennessee, Knoxville

F53: Study on Crystallization Pathways in Zr₆₀Cu₁₀Al₁₅Ni₁₅ Bulk Metallic Glass Forming Alloy: *S. Vincent*¹; Joysurya Basu²; B. S. Murty³; M. J. Kramer⁴; Jatin Bhatt¹; ¹Visvesvaraya National Institute of Technology, Nagpur; ²Indira Gandhi Center for Atomic Research; ³Indian Institute of Technology Madras; ⁴Ames Laboratory, Iowa State University

F54: The Effect of Silicon Addition on the Synthesis of the Zr-Fe-Al Metallic Glass: *Ali Tabeshian*¹; Huahai Maob²; Lars Arnberg¹; Ragnhild Aune¹; ¹Norwegian University of Science and Technology; ²Royal Institute of Technology

F55: Thermodynamic Prediction and Copper-Mold Method for Bulk Metallic Glass Formation of the Ag-Cu-Zr Ternary System: Hsien-Ming Hsiao¹; Chao-Wei Chiua¹; *Mei-Ting Lai*¹; Tzu-Ting Huang¹; Song-Mao Liang²; Rainer Schmid-Fetzer²; Yee-Wen Yen¹; ¹National Taiwan University of Science and Technology; ²Clausthal University of Technology

Characterization of Minerals, Metals, and Materials — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chenguang Bai, Chongqing University; Juan Pablo Escobedo, University of New South Wales; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Neves Monteiro, Military Institute of Engineering, IME, Materials Science Department; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal; Jian Li, CanmetMATERIALS

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B23: A Generalized Convolution Theorem for Bulk Cubic Texture Determination from Ultrasonic Wave Speed: *Bo Lan*¹; Michael Lowe²; Fionn Dunne²; ¹Oxford University; ²Imperial College London

B24: A New Instrument for the Measurement of Seebeck-Coefficients and Electrical Conductivities for Thin Thermoelectric Materials: Rebekka Taubmann¹; Juergen Blumm¹; Reinhard Gschwendtner²; Ekkehard Post¹; *Bob Fidler*³; ¹NETZSCH-Gerätebau GmbH; ²NETZSCH-Gerätebau GmbH ; ³NETZSCH Instruments N.A. LLC

B25: A Study on the Structural Design of Railway Vehicles: *Sung Cheol Yoon*¹; Jeongguk Kim¹; Sung Il Seo¹; ¹Korea Railroad Research Institute/New Transportation Systems Research Center

B26: Adsorption Properties of Cetyltrimethylammonium Bromide Bentonite for Heavy Metals: *Chao Liu*¹; ¹Development & Research Center of WISCO

B27: Advanced Ceramic Materials Applied in the Production of H2 Flow: Evaluation of Performance in the PROX Reaction: *Laédna Neiva*¹; Maria Isabel Brasileiro¹; Ana Karoliny Bezerra¹; Lucianna Gama²; Heloysa Andrade³; ¹Federal University of Cariri; ²Federal University of Campina Grande; ³Federal University of Bahia

B28: Analysis of Porosity and Flexural Strength Changes of Red Ceramic Pieces Incorporated with Ornamental Rock Waste: *Carla Piazzarollo*¹; Gustavo Xavier¹; Sergio Monteiro²; Jonas Alexandre¹; Afonso Azevedo¹; Leonardo Pedroti³; ¹UENF; ²IME; ³UFV

B29: Analysis of the Feasibility of Using Soil from the Municipality of Goytacazes/RJ for Production of Soil-Cement Brick: *Jonas Alexandre*¹; Afonso Azevedo¹; Matias Theophilo¹; Gustavo Xavier¹; Ana Luiza Paes¹; Sergio Monteiro²; Frederico Margem¹; Neila Azeredo¹; ¹UENF; ²IME

B30: Anomalous Nanocrystallization Behavior in Marginal Glass Forming Alloys: *Mustafacan Kutsal*¹; Fatih Sikan¹; Mert Ovun¹; Eren Kalay¹; ¹METU

B31: Ball Indentation Test: The Effect of Test Parameters on Tensile Properties of P92 Steel: *Dipika Barbadikar*¹; A. R. Ballal¹; D.R. Peshwe¹; J. Ganeshkumar²; M.D. Mathew²; ¹VNIT Nagpur; ²IGCAR Kalpakkam

B32: Biodegradable Starch/Copolyesters Flm Reinforced with Silica Nanoparticles – Preparation and Characterization: *Roberta Lima*¹; Rene Oliveira¹; Celio Wataya¹; Esperidiana Moura¹; ¹Instituto de Pesquisas Energéticas e Nucleares

B33: Carbonization of Coals Mixed Iron Ore Fines and Gasification of Resulting Iron Coke with CO2: Transformation of Iron Minerals and Coke Properties: Shengfu Zhang¹; *Wei Liu*¹; Shuxing Qiu¹; Mingrui Yang¹; Manjie Li¹; Haijun Peng¹; ¹Chongqing University

B34: Cause Analysis on Buildup Formation of Carbon Sleeve in Continuous Annealing Furnace for Non-Oriented Silicon Steel Produced by CSP Process: *Mingsheng He*¹; Gaifeng Xue¹; Shoujun Peng¹; Jing Zhang¹; Meng Liu¹; Huasheng Chen¹; ¹Research and Development Center of WISCO **B35: Characterization and Evaluation of Incorporation the Casting Sand in Mortar**: *Afonso Azevedo*¹; Jonas Alexandre²; Euzebio Zanelato²; Sergio Monteiro²; Gustavo Xavier²; Thales Mendonça²; ¹IFF; ²UENF

B36: Characterization of Co-Gd-Ni Alloys: *Tim Prost*¹; Scott Chumbley¹; Yaroslav Mudryk¹; Vitalij Pecharsky¹; ¹Iowa State University/Ames Lab

B37: Characterization of Corrosion Products of Painted Galvanized Steel Under Different Atmospheric Conditions: *Maribel De la Garza Garza*¹; Carlos Vazquez¹; Facundo Almeraya¹; Omar García²; ¹FIME, UANL; ²Ternium

B38: Characterization of Formulation with Ornamental Rock Waste and Clays to Produce Ceramic Paver: *Carlos Maurício Vieira*¹; Thiago Motta¹; Sergio Neves Monteiro¹; ¹State University of the North Fluminense

B39: Characterization of Grain Structure of Al Containing Mg Alloys Without Solution Heat Treatment: *Jung Won Sim*¹; Young Cheol Lee²; Bo Young Hur³; ¹Gyeongsang National University / Metallurgical Engineering; ²Korea Institute of Industrial Technology; ³Gyeongsang National University/ Metallurgical Engineering

B40: Characterization of Mechanical Properties of PP/HMSPP Blends with Natural and Synthetic Polymers Subjected to Gamma-Irradiation: *Elizabeth Cardoso*¹; Sandra Scagliusi¹; Ademar Lugão¹; ¹IPEN - Instituto de Pesquisas Energéticas e Nucleares

B41: Characterization of Polyester Matrix Reinforced with Banana Fibers Thermal Properties by Photoacustic Technique: Foluke Salgado¹; Pedro Netto¹; Frederico Margem¹; Sergio Monteiro²; Romulo Loiola¹; Artur Junior³; *Mariana Barcelos*¹; ¹State University of the Northern Rio de Janeiro; ²Military Institute of Engineering; ³Redentor

B42: Composites with Halogen Free Flame Retardant in ABS Matrix: Flame Retardance and Stability Thermal: *Priscila Martins*¹; Ticiane Valera¹; Eilisabeth Fernandes¹; Jorge Tenório¹; ¹Polytechnic School, São Paulo of University

B43: Cyanidation Study of Slag Rich in Silver: Miguel Perez-Labra¹; *J.Antonio Romero-Serrano*²; E. O. Avila-Davila³; Martin Reyes-Pérez¹; F. R. Barrientos-Hernández¹; I. A. Lira-Hernández³; ¹UAEH MEXICO ; ²IPN ESIQIE; ³Instituto Tecnológico de Pachuca

B44: Deformation Mechanisms in Magnesium Alloy WE43: *Alan Githens*¹; John Allison¹; Samantha Daly¹; ¹University of Michigan

B45: Diffraction Contrast Tomography on a Laboratory X-ray Microscope: *Arno Merkle*¹; Christian Holzner¹; Michael Feser¹; Kevin Fahey¹; Erik Lauridsen²; Peter Reischig²; Henning Friis Poulsen²; Leah Lavery¹; ¹Carl Zeiss X-ray Microscopy, Inc.; ²Xnovo Technology

B46: Discussion and Analysis on Measurement Methods for Mould Friction during High Efficiency Continuous Casting: Yong Ma¹; *Cheng Peng*¹; Wei Gui¹; Wenlin Chen¹; Chengsheng Chu; ¹Heifei University of Technology

B47: Effect of Applied Pressure on the Tribological Behaviour of Dual Particle Size Rutile Reinforced LM13 Alloy Composite: *Rama Arora*¹; Suresh Kumar²; Gurmel Singh³; Om Pandey²; ¹Post Graduate Govt.College for Girls,Sector 11,Chandigarh; ²Thapar University; ³Punjabi University, Patiala

B48: Effect of Cooling Rate during and after Solidification on Microstructure of a PREN 50 Grade Super Duplex Stainless Steel: *Eun-Seok Jang*¹; Ki-Young Kim¹; ¹Korea University of technology and education

B49: Effect of Manganese on the Formation Mechanisms of Silico-ferrite of Calcium and Aluminum (SFCA): *Leige Xia*¹; Xinyu Li¹; Jianliang Zhang¹; Chaoquan Yao¹; Jian Guo¹; Chao Zhang¹; ¹University of Science and Technology, Beijing

B50: Effect of Mercerization and Electron-Beam Irradiation on Mechanical Properties of High Density Polyethylene (HDPE)/Brazil Nut Pod Fiber (BNPF) Bio-Composites: Rejane de Campos¹; Maria Sotenko²; Mahesh Hosur³; Shaik Jeelani³; Francisco Diaz⁴; *Esperidiana Moura*¹; Kerry Kirwan²; Emilia Seo¹; ¹Nuclear and Energy Research Institute, IPEN-CNEN/ SP; ²University of Warwick; ³Tuskegee University; ⁴University of São Paulo

B51: Effect of Microwave Sintering on Piezoelectric and Magnetoelastic Properties of BCZT- CFO Particulate Multiferroic Composites: *Paul Praveen*¹; Vinitha Monaji¹; Dibakar Das¹; ¹University of Hyderabad, SEST

B52: Effect of Mineral Powder Particle Size on the Preparation of Iron Carbide from High Phosphorus Oolitic Hematite: *Jianghua Ma*¹; Guangqiang Li¹; Heng-hui Wang¹; Jian Yang¹; ¹Wuhan University of Science and Technology

B53: Effect of Nitridation Temperature on the Formation of Carbon Fiber Reinforced Reaction Bonded Silicon Nitride Composites: Logesh Govindasamy¹; *Balasubramanian Muthiah*²; ¹Indian Institute of Technology; ²Indian Institute of Technology-Madras, India

B54: Effect of Phosphorus on Phase Transformation, Microstructure and Mechanical Properties in Weathering Resistance Steel: *Li Yan*¹; Zhao zengwu¹; Ding Wei¹; ¹Inner Mongolia University of Science and Technology

B55: Effect Of Potential On The Characteristics Of Oxide Product Layers On Chalcopyrite: *Juan Yu*¹; Hongying Yang²; ¹Xi'an University of Architecture and Technology; ²Northeastern University

B56: Effect of Pre-Existing Texture on Mechanical Properties of Cold Drawn Pearlitic Wire: *Feng Fang*¹; ¹Southeast University

B57: Effect of the Firing Temperature on the Properties of Red Ceramic Incorporated with MSWI Ash: *Nicolle Coutinho*¹; Carlos Maurício Vieira¹; Sérgio Monteiro²; ¹Universidade Estadual do Norte Fluminense; ²Military Institute of Engineering

B58: Sintering and Performance of High Alumina Refractory with **ZrO₂** Addition: *Lei Xu*¹; Min Chen¹; ¹School of Materials and Metallurgy, Northeastern University

B59: Effects of Accelerated Thermal Aging on Polypropylene Modified by Irradiation Process: Washington Oliani¹; *Danilo Fermino*²; Luis Filipe Carvalho Lima¹; Ademar Lugao¹; Duclerc Parra¹; ¹Nuclear and Energy Research Institute, IPEN/USP; ²EPUSP/POLI

B60: Effects of Heat Treatment on Microstructure and Properties of a Precipitation Hardened CuCrZr Alloy: Seyda Polat¹; *Gozde Altug*²; ¹Kocaeli University; ²Gedik University

B61: Effects of High Magnetic Field Annealing on Microstructure and Texture at the Initial Stage of Recrystallization in a Cold-Rolled **Pure Copper Sheets**: *Tong He*¹; Zhang Guojin¹; Sun Wei¹; Zhao Xiang¹; ¹Northeastern University

B62: Electrochemical Properties of Al-Cu Alloys in 1M NaCl Solution: Alejandra Silvina Román¹; Claudia Marcela Méndez¹; *Carlos Enrique Schvezov*¹; Alicia Ares²; ¹IMAM (CONICET-UNaM); ²CONICET/FCEQyN-UNaM

B63: Thermophysical Properties of Modified Ti-Bearing Blast Furnace Slags: *Yongqi Sun*¹; Zuotai Zhang¹; ¹Peking University

B64: Evaluation of Mild Acid Treatment on Brown Bentonite: *Christiano Gianesi Bastos Andrade*¹; Valquiria F. Justo¹; Camila Martini Matos¹; Maria da Graça Silva Valenzuela¹; Cristina Volzone²; Francisco Rolando Valenzuela Diaz¹; ¹USP POLI; ²CETMIC

B65: Evaluation of Palf Fibers Elasticity Modulus with Different Diameters by Weibull Analysis: *Gabriel Glória*¹; Giulio Altoé¹; Frederico Margem¹; Sérgio Monteiro²; Ygor Moraes¹; Pedro Netto¹; ¹State University of the Northern Rio de Janeiro; ²Instituto Militar de Engenharia

B66: Evaluation of Thermoelectric Methods for the Detection of Fretting Damage in 7075-T6 and Ti-6Al-4V Alloys: *Hector Carreon*¹; ¹Universidad Michoacana

B67: Experimental Investigation on High Temperature Roasting of Basic Oxygen Furnace Slag: *Ruirui Wei*¹; Meilong Hu¹; Fangqing Yin¹; Yanhui Liu¹; ¹Chongqing University

B68: Experimental Study of Advanced Treatment of Coking Wastewater Using PFS Coagulation-Photocatalytic Oxidation Technology: *Lei Zhang*¹; ¹WISCO

B69: Experimental Study on Half Dry Flue Gas Desulfurization Ash Used in Steel Slag Composite Material: $Lu Lj^{i}$; ¹WISCO

TMS2015 FINAL PROGRAM

B70: Experimental Study on Oxidation Resistance of Improvement of Iron Based High Temperature Alloy: *Chen Chen*¹; ¹Shanghai University

B71: Fabrication of Nanofilters Using Focused Ion Beam (FIB) and Photolithography Methods: *Paniz Foroughi*¹; Ali Hadjikhani¹; Neal Ricks¹; ¹Florida International University

B72: PHYBAL_{STT} - Fatigue Assessment and Life Time Calculation of the **Ductile Cast Iron EN-GJS-600 at Ambient and Elevated Temperatures**: Marcus Klein¹; *Benjamin Jost*¹; Dietmar Eifler¹; ¹TU Kaiserslautern

B73: Ferronickel Polymerization Behavior of Reduction Roasting High-Magnesium Low-Nickel Oxide Ores in Using Accelerators: *Yonggang Wei*¹; Bo Li¹; Qian Li¹; Shiwei Zhou¹; Baozhong Ma¹; Chengyan Wang¹; ¹Kunming University of Science and Technology

B74: Gold Leaching Characteristics and Intensification of a High S and As-Bearing Gold Concentrate: *Yong-bin Yang*¹; Xiao-liang Liu¹; Qian Li¹; Tao Jiang¹; Bin Xu¹; Yan Zhang¹; ¹Central South University

B75: Hardness and Decomposition of (Ti,Zr)C: *Taoran Ma*¹; Peter Hedström¹; Ida Borgh²; Joakim Odqvist¹; ¹KTH-Royal Institute of Technology, Sweden; ²Sandvik Mining AB, R&D Rock Tools, Sweden

B76: Hot-Pressing and Mechanical Properties of BN Based Composites: *Meng Liu*¹; Yijie Song²; Xiaohong Xu³; Guotao Xu¹; Gaifeng Xue¹; Jixiong Liu²; ¹Research and Development Center of Wuhan Iron and Steel (group) Corporation; ²Advanced Materials R&D Center of Wuhan Iron and Steel (group) Corporation; ³State Key Laboratory of Silicate Materials for Architectures

B77: Identification of Chemical Reactions and Physical-Chemical Principles of Ag8XSe6 (X = Si, Ge, Sn) Argyrodites Synthesis: Mykola Chekaylo¹; V Ukrainets¹; Gryhorij Il'chuk¹; Natalia Ukrainets¹; Yuriy Plevachuk²; I Semkiv¹; Andriy Yakymovych³; ¹Lviv Polytechnic National University; ²Ivan Franko National University; ³University of Vienna

B78: In Situ Electron Microscope Characterization on Deformation Mechanisms and Size-Related Mechanical Properties of Ti: *Qian Yu*¹; Andrew Minor²; ¹Zhejiang University; ²University of California Berkeley

B79: Increasing the Life of Concrete Through Microstructural Changes-Nanosilica as the Concrete Pores Nanofiller to Reduce the Permeability to Moisture: *Robert Miner*¹; Robert Blair¹; Qasem AlNasser¹; Yongfeng Chang¹; Batric Pesic¹; ¹University of Idaho

B80: Influence of Cu2+ and Zn2+ on the Dissolution of Ag in S2O32-Medium: *Julio Cesar*¹; Isauro Rivera¹; Francisco Patiño¹; Miguel Perez¹; Juan Hernández¹; Martin Reyes¹; ¹Universidad Autónoma del Estado dHidalgo

B81: Influence of Gas Nitriding Parameters on the Wear Resistance of AISI 430 Stainless Steels: *Kyu-Sik Kim*¹; Sung-Bo Heo¹; In-Wook Park¹; Byung-Chul Cha¹; Jun-Ho Kim¹; ¹Korea Institute of Industrial Technology

B82: Influence of Pulverized Coal Devolatilization in Tuyere on the Total Burnout Percentage: *Yan Chen*¹; ¹Purdue CIVS

B83: Investigation on Mechanical and Thermal Behaviours of Copolyester/ pla Blend Reinforced with TiO2 Nanoparticle: *Messias Machado*¹; Roberta Lima²; Rene Oliveira²; Esperidiana Moura²; Hélio Wiebeck³; Vijaya Rangari⁴; Shaik Jeelani⁵; ¹ University of São Paulo; ²Instituto de Pesquisas Energéticas e Nucleares; ³University of São Paulo; ⁴ Tuskegee University; ⁵Tuskegee University

B84: Iron Recovery from Copper Slag Through Oxidation-Reduction Magnetic Concentration at Intermediate Temperature: *Zhiwen Wu*¹; ¹Shanghai University

B85: Izod Impact Test in Epoxi Matrix Composites Reinforced with Hemp Fiber: *Lázaro Rohen*¹; Sérgio Monteiro²; Frederico Margem¹; Carlos Maurício Vieira¹; Rafael de Castro³; Fernanda de Paula⁴; Maycon Gomes⁵; Anna Carolina Neves¹; ¹State University of Northern of Rio de Janeiro; ²Instituto Militar de Engenharia; ³Isecensa; ⁴Redentor; ⁵Instituto Federal Fluminense

B86: Mechanical Behavior of Single Phase Ti-7Al Alloy under Dynamic Compression: *Alexandria Will-Cole*¹; Emily Huskins²; Adam Pilchak³; Brian Schuster²; ¹University of Arizona; ²US Army Research Laboratory; ³Air Force Research Laboratory **B87:** Mechanical Properties of Polypropylene Nanocomposites with Organoclay and Discarded Bond Paper: *Danilo Fermino*¹; Washington Oliani¹; Christiano Bastos Andrade¹; Ademar Lugao²; Duclerc Parra²; Francisco Valenzuela Diaz¹; ¹USP; ²IPEN

B88: Metallographic Feature of a Nickel-Based Superalloy in Fluoride Electrolyte Melt: *Bowen Li*¹; Xiaodi Huang¹; Jiann-Yang Hwang¹; ¹Michigan Technological University, WISCO

B89: Microhardness and Deformation Storage Energy Density of NiTi Thin Films: *Yonghua Li*¹; X. D. Wang; W. T. Zheng²; F. L. Meng²; ¹Harbin Engineering University; ²Jilin University

B90: Microstructural Characterization of Surface Degradation for Ag/W Circuit Breaker Contacts during Standardized UL Testing: *Haibo Yu*¹; Yu Sun¹; Jason Harmon²; Jonathan Potter²; S. Pamir Alpay¹; Mark Aindow¹; ¹University of Connecticut; ²GE Energy - Industrial Solutions

B91: Microstructural Evolution And Mechanical Properties Of Metastable Beta Titanium Alloys in the Ti-Nb-Fe System: *Fernando da Costa*¹; Éder Lopes¹; Rubens Junior¹; ¹University of Campinas

B92: Numerical Simulation of the Copper Steel Composite Stave Heat Transfer in the Belly and Lower Shaft Region of the Blast Furnace: *Qi Liui*¹; Shu-sen Cheng¹; Jian-ping Niu²; Dong-dong Liu²; ¹University of Science and Technology Beijing; ²Hebei Wanfeng Metallurgical Spare Parts Co., Ltd

B93: Microstructural Imaging through EBSD Pattern Intensity Analysis: *Matt Nowell*¹; ¹EDAX-TSL

B94: Mn-Doping Effect on Spin-Phonon Coupling in LiFe_{1-x}Mn_xPO₄ Olivines: *Thi Huyen Nguyen*¹; Thi Minh Hien Nguyen¹; Joo Hee Chung¹; Xiang-Bai Chen²; Woo Jun Kwon³; Chul Sung Kim³; In-Sang Yang¹; ¹Ewha Womans university; ²Konkuk University; ³Kookmin University

B95: Morphology and Distribution of Nb-Rich Phase and Graphite in Nb Microalloyed Ductile Iron: *Haicheng Li*¹; Chao Yang¹; Wei Zhang²; Xiangru Chen¹; Qijie Zhai¹; ¹Shanghai University; ²CITIC Metal Co., Ltd

B96: Near Fifty Percent Sodium Substituted Lanthanum Manganites – A Potential Magnetic Refrigerant for Room Temperature Applications: *Imaddin Al-Omari*¹; N. Sethulakshmi²; K. G. Suresh³; M. R. Anantharaman²; ¹Sultan Qaboos University; ²Cochin University of Science and Technology; ³Indian Institute of Technology-Bombay

B97: New Solid Solution MAX Phases: (Ti0.5,V0.5)3AlC2, (Nb0.5,V0.5)2AlC, (Nb0.5,V0.5)4AlC3 and (Nb0.8,Zr0.2)2AlC: Michael Naguib¹; *Grady Bentzel*¹; Jay Shah¹; Joseph Halim¹; El'ad Caspi²; Jun Lu³; Lars Hultman³; Michel Barsoum¹; ¹Drexel University; ²Nuclear Research Centre – Negev, Israel; ³Linkoping University

B98: Nondestructive Characterization of Microstructure and Residual Stress State in Steels by Magnetic Barkhausen Noise Method: *Hakan Gur*¹; ¹Metallurgical & Materials Eng. Dept.

B99: On the Forbidden 1/3 {422} SADP Reflections in FCC Materials: *Cody Miller*¹; Michael Kaufman¹; ¹Colorado School of Mines

B100: Optimization Research of Peritectic Steel Mold Flux with Co2O3 Doping: *Junfu Chen*¹; ¹State Key Laboratory of Silicate Mateials for Architectures, Wuhan University of Technology

B101: Oxidation and Surface Modification of FeS2 during Autogenous Grinding: *Martin Reyes Perez*¹; Francisco Patiño Cardona¹; Elia Guadalupe Palacios Beas²; Ramiro Escudero García³; Mizraim Uriel Flores Guerrero²; Ivan Alejandro Reyes Dominguez⁴; Miguel Labra¹; ¹Universidad Autónoma del Estado de Hidalgo; ²Instituto Politécnico Nacional ESIQuIE; ³Universidad Michoacana de San Nicolas de Hidalgo UMSNH; ⁴Universidad Nacional Autónoma de México UNAM Facultad de Química

B102: Parametric Investigation of the Recycling Boric Acid from Boron-Gypsum: Sabriye Piskin¹; Azmi Seyhun Kipcak¹; Tugce Senberber¹; Meral Yildirim¹; Nurcan Tugrul¹; Emek Moroydor Derun¹; ¹Yildiz Technical University, Chemical Engineering Department

B103: Phase Selection In Cu-Zr Metallic Glass: *Ilkay Kalay*¹; Eren Kalay²; Matthew Kramer³; ¹Cankaya University; ²METU; ³Ames Laboratory

B104: Phase Transformation and Element Migration in the Oxidation Process of Nickel-Copper Sulfide Ore: *Guangshi Li*¹; Hongwei Cheng¹; Xingli Zou¹; Xionggang Lu¹; Changyuan Lu¹; Dan Wang¹; Zhongfu Zhou¹; Qian Xu¹; ¹Shanghai University

B105: Photocatalytic H2 Production Under Visible Light Irradiation on Novel Heterostructure NiS/ZnS Nanosheet Photocatalyst: *Likun Li*¹; ¹Advanced Materials R&D Center of WISCO

B106: Photoluminescence Quenching in Gold - MoS₂ Hybrid Nanoflakes: *Udai Bhanu*¹; Muhammad Islam¹; Laurene Tetard¹; Saiful Khondaker¹; ¹University of Central Florida

B107: Photoluminescence Tuning in Single-Layer MoS₂ via Oxygen Plasma Treatment: *Narae Kang*¹; Hari Paudel¹; Michael Leuenberger¹; Laurene Tetard¹; Saiful Khondaker¹; ¹University of Central Florida

B108: Physico-Chemical and Morphological Characterization of Graphite and Carbon Black After Surface Modification Aiming Its Use as Fillers in Polymers: *Francisco Valenzuela-Diaz*¹; Lais Ronconi¹; Andressa Alves¹; Esperidiana Moura¹; Fabio Esper¹; Guillermo Martin Cortes¹; ¹Universidade de Sao Paulo

B109: Precipitate Chemistry and Morphology in an Aged Mg-Y-Nd-Zr Alloy: *Ellen Sitzmann*¹; John Allison¹; Emmanuelle Marquis¹; ¹University of Michigan

B110: Production and Characterization of AlNiCo Nanopowders: *Merve Genc*¹; Eren Kalay¹; ¹METU

B111: Pullout Tests Behavior of Epoxy Matrix Reinforced with Malva Fiber: Jean Margem¹; Jean Margem²; Frederico Margem³; Vinicius Gomes³; Marina Margem³; Sergio Monteiro⁴; Carolina Ribeiro³; ¹ISECENSA- Instituto de Ensino Superiores do Censa Campos dos Goytacazes, Rio de Janeiro, Brazil.; ²ISECENSA- Instituto de Ensino Superiores do Censa Campos dos Goytacazes; ³UENF -State University of the Northern Rio de Janeiro; ⁴IME

B113: Recovery of Copper from Slow Cooled Ausmelt Furnace Slag by Floatation: Xue Ping¹; Li Guangqiang¹; *Qin Qingwei*¹; ¹Key Lab. for Ferrous Metallurgy & Resources Utilization, Ministry of Education, Wuhan University of Science & Technology

B114: Recovery of Mercury and Lead from Wastewater by Sulfide Precipitation-Flotation: *Li Qian*¹; Liu Ting¹; Deng Peng¹; ¹Central South University

B115: Recrystallization and Microstructural Evolution in Magnesium and Magnesium Alloys: Aeriel Murphy¹; John Allison¹; ¹University of Michigan

B116: Replacement of Carbon Black on Natural Rubber Composites and Nanocomposites - Part 2: Fabio Esper¹; *Guillermo Martín-Cortés*²; Antonio Santana de Arujo¹; Wildor Hennies¹; Maria das Graças Valenzuela¹; Francisco Valenzuela-Díaz¹; ¹Escola Politécnica da Universidade de São Paulo; ²Universidade Estácio de Sá

B117: Effects of Microalloyed Niobium on the Pearlite of Ductile Iron: *Chao Yang*¹; Wei Zhang²; Haicheng Li¹; Xiangru Chen¹; Qijie Zhai¹; ¹Shanghai University; ²CITIC Metal Co., Ltd

B118: Research of the Effects of Temperature on the Decrepitation **Performance of Natural Lump Ores**: Zuo Haibin¹; *Yu Wentao*¹; Zhang Jianliang¹; ¹University of Science and Technology Beijing

B119: Research on a Novel Technology of Solvent Extraction of Bismuth and Preparation of Bi2O3 from BiCl3 Solution: Zhijian Wang¹; *Jing Zhan*¹; Chuanfu Zhang¹; Fenghua Ding¹; ¹Central South University

B120: Research on Reasonable Particle Size of Coal Blends for Blast Furnace Injection: Semi Coke and Bitumite: *Haiyang Wang*¹; Runsheng Xu¹; Tengfei Song¹; Pengcheng Zhang¹; ¹University of Science and Technology Beijing

B121: Silver Cementation with Zinc from Residual X Ray Fixer, Experimental and Thermochemical Study: *Miguel Perez-Labra*¹; Martin Reyes Pérez¹; A. Romero Serrano²; E. O. Ávila-Dávila³; F. Patiño Cardona¹; J. Hernández Avila¹; F. R. Barrientos Hernández¹; ¹UAEH MEXICO; ²IPN ESIQIE; ³Instituto Tecnológico de Pachuca

B122: Site Specific Three-Dimensional Structural Analysis Using Focused Ion Beam for Nuclear Materials Forensics: *Brandon Chung*¹; Robert Erler¹; ¹Lawrence Livermore National Laboratory

B123: Study of Wettability of Clayey Ceramic and Fluorescent Lamp Glass Waste Powders: *Alline Morais*¹; Sergio Monteiro²; Sebastião Ribeiro³; Leonardo Sardinha¹; Carlos Maurício Vieira⁴; ¹Instituto Federal Fluminense -IFF; ²Military Institute of Engineering, IME, Materials Science Department; ³University of São Paulo; ⁴State University of the North Fluminense Darcy Ribeiro – UENF

B124: Study on Raw Sea Sand Iron Ore and Its Beneficiation: *Wen-guang Dai*¹; Shaobo Zheng¹; Huigai Li¹; Zemin Zhuang¹; ¹School of Material Science and Engineering, Shanghai University

B125: Taper and Aspect Ratio Calibration in FIB Milling: *Ali Hadjikhani*¹; Paniz Foroughi¹; ¹FIU

B126: Tensile Strength of Polyester Composites Reinforced with Fique Fibers: Giulio Altoé¹; Sérgio Monteiro²; *Frederico Margem*¹; Pedro Netto¹; Glênio Daniel³; Maria Carolina Teles¹; ¹State University of the Northern Rio de Janeiro - UENF; ²IME; ³FACREDENTOR

B127: The Chemical Composition and Micro-Mechanical Properties of Cooling γ' Precipitates in a Polycrystalline Nickel Alloy: *Muzi* Li¹; Barbara Shollock²; Fionn Dunne¹; ¹Imperial College London; ²University of Warwick

B128: The Effect of Incorporation of Sludge of the Sewage Treatment Station (STS) of the Municipality of Campos dos Goytacazes - Brazil -On Red Ceramic: *Isabela Areias*¹; Carlos Maurício Vieira¹; Sérgio Monteiro²; Juliana de Faria¹; ¹State University of the North Fluminense; ²Military Institute of Engineering

B129: The Effects of High Al2O3 on the Metallurgical Properties of Sinter: *Yu Wentao*¹; Zuo Haibin¹; Zhang Jiang liang¹; ¹University of Science and Technology Beijing

B130: Thermal and Mechanical Properties of Bulk ZrB₂: *Fumihiro Nakamori*¹; Yuji Ohishi¹; Hiroaki Muta¹; Ken Kurosaki¹; Shinsuke Yamanaka¹; ¹Osaka University

B131: Thermal Conductivity of Liquid Sn-Bi Alloy: *Toshiki Kondo*¹; Yuji Ohishi¹; Hiroaki Muta¹; Ken Kurosaki¹; Shinsuke Yamanaka¹; ¹Osaka university

B132: Thermographic Characterization of Electrical Units in Diesel Electric Locomotive for Effective Maintenance: *Jeongguk Kim*¹; Chang-Young Lee¹; ¹Korea Railroad Research Institute

B133: Thermophysical Properties of Molten Zr-Fe Alloys Measured by Electrostatic Levitation: *Yuji Ohishi*¹; Toshiki Kondo¹; Hiroaki Muta¹; Ken Kurosaki¹; Shinsuke Yamanaka¹; Junpei Okada²; Takehiko Ishikawa²; ¹Osaka University; ²Japan Aerospace Exploration Agency

B134: Very High Cycle Fatigue Behavior of Magnesium Alloy WE43: *Jacob Adams*¹; J. Wayne Jones¹; John Allison¹; ¹University of Michigan

B135: Automated Orientation and Strain Mapping using Nanobeam Coupled with Precession Electron Diffraction: *Xuan Liu*¹; Amith Darbal; R. Narayan²; J. Mardinly³; S. Nicolopolous⁴; J. Weiss⁴; ¹AppFive; ²AppFive LLC; ³Arizona State University; ⁴NanoMEGAS SPRL

B136: Ti-Cu Alloys in the Semisolid State: Phase Diagram and Microstructure Evaluation: Kaio Niitsu Campo¹; Rubens Caram¹; ¹University of Campinas

B137: Viscoelastic Property of CaO-SiO2-Al2O3-Na2O-F Based System: SeungHo Shin¹; JungWook Cho¹; DaeWoo Yoon¹; JiYeon Baek¹; *SeonHyo Kim*¹; ¹POSTECH

B138: Zinc Chloride, Sodium Hydroxide and Boric Acid Molar Ratio Determination for the Production of Zinc Borates: *Mehmet Burcin Piskin*¹; Azmi Seyhun Kipcak¹; Meral Yildirim¹; Tugce Senberber¹; Nurcan Tugrul¹; Emek Moroydor Derun¹; ¹Yildiz Technical University **B139:** Zinc Recovery from Zinc Oxide Flue Dust during the Neutral Leaching Process by Ultrasound: *Zheng Xuemei*¹; Li Jing¹; Ma Aiyuan¹; Peng Jinhui¹; Zhang Libo¹; Yin Shaohua¹; ¹ Yunnan Provincial Key Laboratory of Intensification Metallurgy, Key Laboratory of Unconventional Metallurgy, Ministry of Education, Kunming University of Science and Technology

B140: Mechanical Performance, Constitutive Response and Fragmentation of Tailored Mesostructured Aluminum-Based Compacts: *Andrew Marquez*¹; Marc Meyers¹; Christopher Braithwaite²; Timothy Weihs³; Kenneth Vecchio¹; David Benson¹; Nick Krywopusk³; Melisa Ribero¹; ¹University of California, San Diego; ²University of Cambridge; ³Johns Hopkins University

B141: Clinker Production from Waste: From Cellulose Industry and Processing Marble and Granite Industry: *Leonardo Pedroti*¹; Carlos Fontes Vieira²; Jonas Alexandre²; Sergio Monteiro³; Larice Justino¹; Gustavo Xavier²; ¹Universidade Federal de Viçosa; ²Universidade Estadual Norte Fluminense; ³Instituto Militar de Engenharia

Characterization of Nuclear Reactor Materials and Fuels with Neutron and Synchrotron Radiation — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee

Program Organizers: Jonathan Almer, Argonne National Laboratory; Meimei Li, Argonne National Laboratory; Donald Brown, Los Alamos National Laboratory; Tiangan Lian, Electric Power Research Institute

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

K1: Behavior of Deutride Particle in Zircaloy under Thermal Cycles and Stress Investigated by In-Situ Neutron Diffraction: *Jun-li Lin*¹; Brent Heuser¹; Ke An²; ¹University of Illinois at Urbana Champaign; ²Oak Ridge National Laboratory

K2: Characterization of Internal Strain During Incremental Loading of Zircaloy-2: *Travis Skippon*¹; Christopher Cochrane¹; Mark Daymond¹; ¹Queen's University

K3: High Energy X-ray Diffraction Study of Deformation Behavior of Alloy HT-9: *Carolyn Tomchik*¹; Kun Mo²; Jun-Li Lin¹; Yinbin Miao¹; Di Yun²; Abdellatif Yacout²; Jeff Terry³; Jonathan Almer²; Stuart Maloy⁴; James Stubbins¹; ¹University of Illinois at Urbana-Champaign; ²Argonne National Laboratory; ³Illinois Institute of Technology; ⁴Los Alamos National Laboratory

K4: In-Situ Synchrotron Investigations on the Deformation-induced Martensitic Transformation in Metastable Austenitic Steels with and without Oxygen-Enriched Nanoparticles: *Yinbin Miao*¹; Kun Mo²; Zhangjian Zhou³; Xiang Liu¹; Kuan-Che Lan¹; Jonathan Almer²; James Stubbins¹; ¹University of Illinois at Urbana-Champaign; ²Argonne National Laboratory; ³University of Science and Technology Beijing

K5: Influence of Thermal Aging on the Tensile Properties of Alloy 617: An In-Situ Synchrotron X-ray Diffraction Investigation: *Xiang Liu*¹; Kun Mo²; Yinbin Miao¹; Kuan-Che Lan¹; Wei-Ying Chen¹; Carolyn Tomchik¹; Guangming Zhang³; Rachel Seibert⁴; Jeff Terry⁴; James Stubbins¹; ¹University of Illinois at Urbana Champaign; ²Argonne National Laboratory; ³University of Science and Technology Beijing; ⁴Illinois Institute of Technology

K6: Investigation on Hydride Particle in Zircaloy-4 by Utilizing High Energy Synchrotron X-ray: *Jun-li Lin*¹; Brent Heuser¹; Jonathan Almer²; ¹University of Illinois at Urbana Champaign; ²Argonne National Laboratory

K7: Microbeam X-ray Diffraction and TEM Characterization of Irradiation Effects by Fission Fragment Energy Xe Ion Beam: *Di Yun*¹; Kun Mo¹; Ruqing Xu¹; Yinbin Miao²; Sumit Bhattacharya³; Walid Mohamed¹; Bei Ye¹; Michael Pellin¹; Abdellatif Yacout¹; ¹Argonne National Laboratory; ²University of Illinois at Urbana-Champaign; ³Northwestern University

K8: Structural Investigation of UO2+x at Extreme Conditions by Synchrotron XRD Measurements: *Fuxiang Zhang*¹; ¹University of Michigan

Computational Modeling and Stochastic Methods for Materials Discovery and Properties — Poster Session

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Dallas Trinkle, University of Illinois at Urbana-Champaign; Mikhail Mendelev, Ames Laboratory; Adri van Duin, Pennsylvania State University

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G1: Atomistic Simulations of Deformation of Nanocrystalline Mg-Li Alloys: *Shivraj Karewar*¹; Niraj Gupta¹; Sébastien Groh²; Alfredo Caro³; Srinivasan Srivilliputhur¹; Enrique Martinez³; ¹University of North Texas; ²TU Bergakademie Freiberg; ³LANL, NM

G2: Computational Modeling Studies of the Minerals Sulphides with the Pentlandite Structure: Derivation of the Potential Models: *Mofuti Mehlape*¹; Phuti Ngoepe¹; Steve Parker²; ¹University of Limpopo; ²University of Bath

G3: Cross-Sectional Size and Interface Roughness Effects on Thermal Conductivity of Ge/Si Core/Shell Nanowires: Sevil Sarikurt¹; Cem Sevik²; Alper Kinaci³; Justin Huskins⁴; Tahir Cagin⁵; ¹Dokuz Eylul University; ²Anadolu University; ³Argonne National Laboratory; ⁴NASA Ames Research Center; ⁵Texas A&M University

G4: Effect of Pore Characteristics on Elastic Modulus of Porous Titanium by Numerical Simulation: *Yilong Liao*¹; Guibao Qiu¹; Yang Yang¹; Cui Hao¹; ¹Chongqing University

G5: First-Principles Investigation of d-Impurity Effect on Stacking Fault Energy of fcc Iron: *Krista Limmer*¹; Julia Medvedeva¹; David van Aken¹; Nadezhda Medvedeva²; ¹Missouri University of Science and Technology; ²Institute of Solid State Chemistry

G6: Indentation of Zirconium and Zirconia by Atomistic Simulation: *Zizhe Lu*¹; Mark Noordhoek¹; Aleksandr Chernatynskiy¹; Susan Sinnott¹; Simon Phillpot¹; ¹University of Florida

G7: Modelling *Rhizophora Mangle* L Bark-Extract Effects on Concrete Steel-Rebar in 0.5 M H₂SO₄: Implications on Concentration for Effective Corrosion-Inhibition: *Joshua Okeniyi*¹; Cleophas Loto¹; Abimbola Popoola²; ¹Covenant University, Ota, Nigeria; ²Tshwane University of Technology, Pretoria, South Africa

G8: Numerical Analysis for Thermal Stress of Side Wall with Composite Structure on Twin Roll Strip Casting: *Jian-hong Dong*¹; Min Chen¹; Nan Wang¹; ¹Northeastern University

G9: Numerical Simulation for the Mixing Process of Converter with **Preheating Oxygen**: *Fuhai Liu*¹; Rong Zhu¹; Kai Dong¹; ¹University of Science & Technology Beijing

G10: Quantitative Atomistic Modeling of Metals at Melting Point Using Phase-Field Crystals: *Ebrahim Asadi*¹; Mohsen Asle Zaeem¹; Sasan Nouranian²; Michael Baskes³; ¹Missouri University of Science and Technology; ²The University of Mississippi; ³University of California, San Diego

Computational Thermodynamics and Kinetics — Poster Session I

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Maryam Ghazisaeidi, The Ohio-State University; Vidvuds Ozolins, University of California Los Angeles

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

G11: Energetics for Lead Migration Across Pt/Pb(Zr,Ti)O3 and Pt3Pb/ Pb(Zr,Ti)O3 Interfaces: A Computational Study: *Fang-Yin Lin*¹; Aleksandr Chernatynskiy¹; Simon Phillpot¹; Juan Nino¹; Jacob Jones²; Susan Sinnott¹; ¹University of Florida; ²North Carolina State University

G12: First-Principle Study of Vacancy-Mediated Diffusion of Poor Metals in hcp-Ti: Lucia Scotti¹; Alessandro Mottura¹; ¹University of Birmingham

G13: He Diffusion in Pure and Defected MgO Under High Pressure in Lower Mantle: *Zhewen Song*¹; Henry Wu¹; Sujoy Mukhopadhyay²; James Van Orman³; Dane Morgan¹; ¹University of Wisconsin - Madison; ²Harvard University; ³Case Western Reserve University

G14: High-Throughput Ab-Initio Diffusion with the MAterials Simulation Toolkit (MAST): *Henry Wu*¹; Tam Mayeshiba¹; Dane Morgan¹; ¹University of Wisconsin-Madison

G15: Electro-Thermo-Mechanical Properties and Defect Kinetics in {AxA'(1-x)}{ByB'(1-y)}O3 Ceramics: Berna Akgenc¹; Çetin Tasseven²; Tahir Çagin³; ¹Kirklareli University; ²Yildiz Technical University; ³Texas A&M University

G16: First Principle Study on Energetic Stability for Mg-Based Long-Period Stacking Ordered Structures: *Ryohei Tanaka*¹; Koretaka Yuge¹; ¹Kyoto University

G17: Molecular Dynamics Study of Structural and Transport Properties OF FeO-SiO2-V2O3 System: *Zhen Zhang*¹; Bing Xie¹; Jiang Diao¹; Lu Jiang¹; Hongyi Li¹; ¹Chongqing University

G18: Ab Initio Calculation of the Effect of Impurities on Antiphase Boundaries in Ni₃Al: *Ruoshi Sun*¹; Christopher Woodward²; Axel van de Walle¹; ¹Brown University; ²Air Force Research Laboratory

G19: Non-Random Topology of Grain Boundary Network and Its Effect on Grain Boundary Diffusivity: *Sharniece Holland*¹; Lin Li¹; ¹The University of Alabama

G20: Variant Selection of Grain Boundary \945 in Bi-Crystalline \945/\946 Titanium Alloys: *Di Qiu*¹; Rongpei Shi²; Weijie Lu¹; Yunzhi Wang²; ¹Shanghai Jiao Tong University; ²The Ohio State University

G21: Non-Destructive Boundary Migration Tracking during Coarsening and Subsequent Quantification of Boundary Dynamics: *Siddharth Maddali*¹; Shlomo Ta'asan¹; Robert Suter¹; ¹Carnegie Mellon University

G22: First-Principles Study on Interface Cohesive Energy for Mo-Based Alloys: *Koretaka Yuge*¹; Yuichiro Koizumi²; Koji Hagihara³; Takayoshi Nakano³; Kyosuke Kishida¹; Haruyuki Inui¹; ¹Kyoto University; ²Tohoku University; ³Osaka University

G23: First-Principles Calculations of Mg/MgO Interfacial Free Energies: *Wenwu Xu*¹; Andrew Horsfield²; David Wearing²; Peter Lee¹; ¹The University of Manchester; ²Imperial College London

G24: Simulation of Natural Gas Combustion Liftoff and Blowout Phenomenon in Blast Furnace: Yan Chen¹; ¹Center for Innovation through Visualization and Simulation

Computational Thermodynamics and Kinetics — Poster Session II

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Computational Materials Science and Engineering Committee

Program Organizers: Richard Hennig, University of Florida; Francesca Tavazza, National Institute of Standards and Technology; Maryam Ghazisaeidi, The Ohio-State University; Vidvuds Ozolins, University of California Los Angeles

Monday PMRoom: Atlantic HallMarch 16, 2015Location: Dolphin

G25: Computational Modeling of Mixed Ionic Electronic Conducting (MIEC) Oxygen Separation Membrane: *Fazle Rabbi*¹; ¹University of South Carolina

G26: Multiscale Modeling for Electrocatalytic Systems: *Andrew Antony*¹; Tao Liang¹; Michael Janik²; Janna Maranas²; Susan Sinnott¹; Sneha Akhade²; ¹University of Florida; ²Pennsylvania State University

G27: Catalytic Effect of Fe₂O₃, MnO₂ and MgO on the Gasification Reaction of Biomass Char: Hai-bin Zuo¹; *Wei wei Geng*¹; Guang-wei Wang²; Jian-liang Zhang²; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing; ²School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing,

G28: Microstructural Modelling of Dynamic Recrystallization during Friction Surfacing: *Javed Akram*¹; Prasad Kalvala¹; Mano Misra¹; ¹University of Utah

G29: The Kinetics Test of Vanadium-Titanium Magnetite Iron Ore in Smelting Reduction: Zemin Zhuang¹; Jieyun Chen¹; Bo Meng¹; Shaobo Zheng¹; ¹Shanghai University

G30: Dissipative Particle Dynamics Simulation of the Rheology of Solid-Liquid Coexistence System in BF Slag: *Jiajia Tu*¹; Liangying Wen¹; Shengfu Zhang¹; Guibao Qiu¹; Danyang Zhang¹; ¹ChongQing University

G31: Study of Combustion Property of Biomass Char/Coal Char Blended Char Based on Isothermal Thermogravimetry in O2/N2 Atmospheres: Haibin Zuo¹; *Pengcheng Zhang*¹; Guangwei Wang¹; Weiwei Geng¹; Jianliang Zhang¹; ¹University of Science and Technology Beijing

G32: Strengthen Reduction Process of Vanadium Titano-Magnetite Adding NaF under High Temperature: Xu Jiang¹; ¹Xianyang Vocational Technical College

G33: Thermodynamic Analysis for Formation of Ti(C,N) in Blast Furnace and Factors Affecting TiO₂ Activity: *Chaoquan Yao*¹; Jianliang Zhang¹; Xinyu Li¹; Yapeng Zhang¹; Chao Zhang¹; ¹University of Science and Technology Beijing

G34: A Modified Random Pore Model for Gasification Kinetics of Coal Char and Biomass Char: *Guang wei Wang*¹; Jian liang Zhang¹; Wei wei Geng¹; Jiu gang Shao¹; ¹School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing

G35: Application of MIVM for Cu-Ni Alloy in Vacuum Distillation: Lingxin Kong¹; Anxiang Wang¹; Bin Yang¹; Baoqiang Xu¹; Yifu Li¹; Dachun Liu¹; ¹Kunming University of Science and Technology

G36: Thermodynamic Assessment of Ag-Zr and Cu-Zr Binary Systems: Hsien-Ming Hsiao¹; *Jia-Ying Dai*¹; Tzu-Ting Huang¹; Song-Mao Liang²; Rainer Schmid-Fetzer²; Yee-Wen Yen¹; ¹National Taiwan University of Science and Technology; ²Clausthal University of Technology

G37: Crystallization in Supercooled BCC-Vanadium, HCP-Zinc and FCC-Aluminum: *Yongquan Wu*¹; Rong Li¹; Junjiang Xiao¹; Yewei Jiang¹; ¹Shanghai University

G38: Portland Cement Clinker Formation: High Temperature Equilibria and Phase Composition Prediction Using a Computational Tool: Daniel Jiménez¹; Oscar Restrepo Baena¹; ¹Universidad Nacional de Colombia **G39: Solid-Like Clusters in Supercooled Liquid Fe: A Study of Molecular Dynamics Simulation**: *Rong Li*¹; Junjiang Xiao¹; Yongquan Wu¹; ¹Shanghai University

Dynamic Probing of Microstructure Evolution in Nanostructured Materials — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee Program Organizers: Nan Li, Los Alamos National Laboratory; Caizhi Zhou, Missouri University of Science and Technology; Dan Gianola, University of Pennsylvania; Marc Legros, CEMES-CNRS

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B142: Fabrication and Characterization of (100)-Oriented Single Crystalline Cu Pads and Lines: *Tien-Lin Lu*¹; Wei-Lan Chiu¹; Yi-Sa Huang¹; Chia-Ling Lu¹; Han-wen Lin¹; Chih Chen¹; ¹National Chiao Tung University

B143: Crystal Plasticity Analysis of Deformation Behavior of Nanocrystalline Nickel: *Rui Yuan*¹; Irene Beyerlein²; Caizhi Zhou¹; ¹Missouri University of Science and Technology; ²Los Alamos National Laboratory

B144: Deformation Mechanisms in Cu/Nb Nano Layers as Revealed by Synchrotron X-ray Micro Diffraction and In Situ Nano Mechanical Testing Inside an SEM: *Karthic Rengarajan*¹; Lucas Berla²; Nan Li³; Patricia Dickerson³; Jian Wang³; Nobumichi Tamura⁴; Martin Kunz⁴; William Nix²; Amit Misra³; Arief Budiman¹; ¹Singapore University of Technology & Design; ²Stanford University; ³Los Alamos National Laboratory; ⁴Lawrence Berkeley National Laboratory

B145: Understanding the Strength and Plastic Deformation of Al–TiN Nanolayered Composites by 3-D Dislocation Dynamics Simulations: *Sixie Huang*¹; Caizhi Zhou¹; ¹Missouri University of Science and Technology

EPD 2015 Technical Division Student Poster Contest — Graduate

Sponsored by: TMS Extraction and Processing Division

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

SPG-2: Carbochlorination of Cerium Dioxide: Alexandra Anderson¹; Brajendra Mishra¹; ¹Colorado School of Mines

SPG-3: Development of a Variable Inductor with a Memory Form Wire: *Evandro Alves Torquato Filho*¹; Simplício Arnaud da Silva¹; Cícero da Rocha Souto¹; Samuel de Oliveira¹; André Fellipe Cavalcante Silva¹; ¹Universidade Federal da Paraíba

SPG-4: Prediction of Elastic Strength Coil of Shape Memory Alloy Using **Fuzzy Controller**: *Samuel Oliveira*¹; Simplício Arnaud da Silva¹; Cícero da Rocha Souto¹; Alexsandro José Virgínio dos Santos¹; Rebeca Casimiro de Souza¹; ¹Universidade Federal da Paraíba

SPG-5: Solvent Extraction of Neodymium Using PC-88A Extractant: *Vivek Agarwal*¹; ¹South Dakota School of Mines and Technology

EPD 2015 Technical Division Student Poster Contest — Undergraduate

Sponsored by: TMS Extraction and Processing Division

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SPU-1: Application of a Fuzzy Controller to Actuator Driven by Shape Memory Alloys: André Silva¹; Alexsandro Santos²; Cícero Souto²; Simplicio Silva²; Ana Lima³; ¹IFPB - Campus Cajazeiras; ²UFPB; ³TJPB - Paraiba Court of Justice

SPU-2: Photo-degradation of Atrazine with Recycled Glass Filter Functionalized with TiO2: *Luis Laracuente*¹; Amarillys Aviles²; Liliana Hernandez²; Gerardo Nazario²; Jorge De Jesús¹; O. Marcelo Suárez³; ¹Mechanical Engineering Department, University of Puerto Rico, Mayagüez; ²Civil Engineering Department, University of Puerto Rico, Mayagüez; ³General Engineering Department, University of Puerto Rico, Mayagüez;

EPD 2015 Technical Division Young Professional Poster Contest

Sponsored by: TMS Extraction and Processing Division, TMS: Young Professionals Committee

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YP-1: Behavior Training of Actuator Wire with Shape Memory Submitted to Different Amplitude of Electric Current Waves: *Cicero Souto*¹; Evandro Alves Torquato Filho¹; Simplício Arnaud da Silva¹; Daniel Nicolau Lima Alves¹; Julyana Maria de Medeiros Quirino¹; ¹Federal University of Paraiba

YP-2: Electrochemistry and Materials Chemistry in Service of Extractive Metallurgy and Environmental Issues: *Fariba Safizadeh*¹; Edward Ghali¹; Faïçal Larachi¹; Sébastien Royer²; Isabelle Batonneau-Gener²; ¹Laval; ²Université de Poitiers

Fatigue in Materials: Fundamentals, Multiscale Modeling, Life Prediction and Prevention — Poster Session

Sponsored by: TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Computational Materials Science and Engineering Committee, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Antonios Kontsos, Drexel University

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Session Chair: Antonio Kontsos, Drexel University

C6: Evaluation of Fatigue Strength of the Bogie for Railway: *Sung Cheol Yoon*¹; ¹Korea Railroad Research Institute/New Transportation Systems Research Center

C7: Evolution of Welding Residual Stress under Cyclic Loadings: *Zhongyuan Qian*¹; Scott Chumbley²; Eric Johnson³; ¹Invetech LLC; ²Iowa State University; ³John Deere

C8: Fatigue Behavior of an X70 Pipeline Steel: *Bilin Chen*¹; Gongyao Wang¹; Ke An²; Yanli Wang²; Peter Liaw¹; ¹University of Tennessee; ²Oak Ridge National Laboratory

C9: High-Temperature-High Pressure Stress-Strain Testing of Materials in Co2-Containing Saline Solutions: *Anja Pfennig*¹; ¹HTW Berlin C10: Linkage Between Ductile Fracture and Extremely Low Cycle Fatigue of Inconel 718 under Multiaxial Loading Conditions: *Mohammed Algarni*¹; Yuanli Bai¹; Yueqian Jia¹; Ali Gordon¹; Justin Karl¹; ¹University of Central Florida

C11: The Effect of Galvanically Induced Corrosion Damage on the Fatigue Crack Formation Behavior of Al 7050-T7451: *Noelle Easter Co*¹; James¹; ¹University of Virginia

C12: Variable Amplitude Loading Effects on a Carbon Filled Styrene Butadiene Rubber: *Nicholas Usry*¹; Marcos Lugo²; Nima Shamsaei¹; ¹Mississippi State University; ²Center for Advanced Vehicular Systems

C13: Preliminary Investigation of the Influence of Hydrogen on the Fatigue Crack Nucleation of Ti-6Al-4V: *Leonardo Campanelli*¹; Claudemiro Bolfarini¹; ¹Federal University of São Carlos

FMD 2015 Technical Division Student Poster Contest — Graduate

Sponsored by: TMS Functional Materials Division (formerly EMPMD)

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

SPG-6: An Ab Initio-Aided Experimental Investigation on W-Doped Li4Ti5O12 Defect Spinel as Anodes for Li Ion Batteries: *Ping-chun Tsai*¹; Shih-kang Lin¹; Wen-Dung Hsu¹; ¹National Cheng Kung University (NCKU)

SPG-7: Effect of Joint Length on Void Formation and Intermetallic Compound Dissolution for Pb-Free Solders during Electromigration: *Tzu-Yu Hsu*¹; Chung-hsun Tsai¹; Fan-Yi Ouyang¹; ¹National Tsing-Hua University

SPG-8: Effect of Temperature Gradient on the Growth of Ag3Sn Intermetallic Compounds in Sn3.5Ag Solder during Thermo-Compressive Bonding Process: *Chieh-Fu Chen*¹; Yu-Ping Su¹; Fan-Yi Ouyang¹; ¹National Tsing Hua University

SPG-9: Interfacial Effects on MoS₂ Electrical Performance: *Philip Campbell*¹; Alexey Tarasov¹; Meng-Yen Tsai¹; Zohreh Hesabi¹; Janine Feirer¹; Samuel Graham¹; W. Jud Ready¹; Eric Vogel¹; ¹Georgia Institute of Technology

SPG-10: Phase Equilibria of Pb-Sb-Se Ternary Thermoelectric Material System: Jui-Shen Chang¹; Sinn-wen Chen¹; ¹National TsingHua University

SPG-11: Role of Defects on the Electrochemical Performance of Vanadium Oxide for Sodium-Ion Battery: *Evan Uchaker*¹; ¹University of Washington

SPG-12: Soft Magnetic Composites of Alumina Coated, Ball Milled Iron Powders Reduce Eddy Current Losses for Electromagnetic Devices: *Katie Jo Sunday*¹; Adam Falcone¹; Bill Nguyen¹; Eric Angell¹; Mitra Taheri¹; ¹Drexel University

SPG-13: The Influence of Thermal Cycling on the Phase Transformation Temperatures, Structure and Mechanical Properties of TI50,0NI50,0 Alloy: *Anna Churakova*¹; Dmitry Gunderov¹; ¹Institute Physics of Advanced Materials

FMD 2015 Technical Division Student Poster Contest — Undergraduate

Sponsored by: TMS Functional Materials Division (formerly EMPMD)

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SPU-3: Development of Circuit Integrated Carbon Nanotube Supercapacitors within Doped Silicon Wafers: *Ravi Konjeti*¹; Jud Ready¹; Stephan Turano¹; ¹GTRI

SPU-4: Effect of Temperature on Thermomigration of Solder Joints: *Yi-Shan Yang*¹; Fan-Yi Ouyang¹; Tzu-Yang Lin¹; ¹National Tsing Hua University, Taiwan

FMD 2015 Technical Division Young Professional Poster Contest

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Young Professionals Committee

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YP-4: Effects of Anisotropic Beta-Sn Alloys on Cu Diffusion Under a Temperature: *Fan-Yi Ouyang*¹; Wei-Neng Hsu¹; ¹National Tsing Hua University

YP-5: Formation of [010]-Oriented Sb2Se3 Whisker: The Crystal Structure and Thermoelectric Properties: *Hsin-Jay Wu*¹; Sinn-wen Chen²; ¹National Sun Yat-sen University; ²National Tsing Hua University

Friction Stir Welding and Processing VIII — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Shaping and Forming Committee

Program Organizers: Rajiv Mishra, University of North Texas; Murray Mahoney, retired from Rockwell Scientific; Yutaka Sato, Tohoku University; Yuri Hovanski, Pacific Northwest National Laboratory

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A5: Monitoring of the Quality of AA 6082 – T4 Friction Stir Welded Joints by Acoustic Emission Technique: *B M Rajaprakash*¹; Suresaha C N²; Sarala Upadhya¹; ¹University Visvesvaraya College of Engineering; ²Jyothy Institute of Technology

A6: Assessment of Friction Stir Weld Quality by Analyzing the Weld Bead Surface Using Both Digital Image Processing and Acoustic Emission Techniques: *Rajashekar R*¹; Rajaprakash B M¹; Sarala Upadhya¹; ¹University Visvesvaraya College of Engineering

A7: Development of FSW Simulation Model-Effect of Tool Shape on Plastic Flow: Yurika Miyake¹; Fumikazu Miyasaka¹; Shuhei Matsuzawa¹; Shunta Murao¹; Kenta Mitsufuji¹; Shinnosuke Ogawa¹; ¹Osaka University

A8: Effect of Rotational Speed on the Microstructure of Friction Stir welded AA 7075-T6 Age Hardenable Aluminium Alloy: *Chandrashekhar Gogte*¹; Ajay Likhite²; Sandip Patil¹; Dilip Peshwe²; ¹Marathwada Institute of Technology; ²Visvesvaraya National Institute of Technology

A9: Fabrication and Mechanical Properties of Graphite/Aluminum Composite Joints Using Friction Stir Spot Welding: Hyun-Seok Oh¹; Yong-Ha Jeong¹; Young-Jin Yum¹; Doo-Man Chun¹; *Sung-Tae Hong*¹; ¹University of UIsan

A10: Fatigue Life of Friction Stir Welded- Aluminum Alloy 7010 Joints: Magdy El Rayes¹; Ehab El-Danaf¹; Mahmoud Soliman¹; ¹King Saud University

A11: Fatigue Performance of Dissimilar Friction Stir Welded Aluminum Alloys 5754–6082: Ehab El-Dana⁽¹⁾; Magdy El-Rayes¹; ¹King Saud University

A12: Improving Heat-Affected Zone Liquation Cracking Resistance of Magnesium Alloy AZ91E by Friction Stir Processing: *G.M. Karthik*¹; G.D. Janaki Ram¹; Ravi Sankar Kottada¹; ¹Indian Institute of Technology Madras

A13: Effect of Friction Stir Processing on the Damage Resistance of 6xxx Series Aluminium Alloys: *Aude Simar*¹; Florent Hannard¹; Sidney Castin¹; Eric Maire²; Thomas Pardoen¹; ¹Universite catholique de Louvain; ²INSA Lyon

A14: Temperature Distribution and Welding Distortion Measurements after FSW OF Al 6082-T6 Sheets: Iurii Golubev¹; Evgenii Chernikov¹; Anton Naumov¹; Vesselin Michailov¹; ¹St.Petersburg State Politechnic University

A15: An Assessment on Mechanical and Microstructural Properties of Underwater Friction Stir Welding of 316 L Austenitic Stainless Steel: Shashi Kumar¹; Murugan¹; ¹Coimbatore Institute of Technology

General Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS Functional Materials Division (formerly EMPMD), TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division

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L1: Solution and Aging of the MAR-M246 Nickel-Based Superalloy: *Renato Baldan*¹; Antonio Augusto Araújo da Silva²; Carlos Nunes²; Antonio Couto¹; Sinara Gabriel³; ¹IPEN - Nuclear Energy Research Institute; ²USP - University of São Paulo; ³UFRJ - Universidade Federal do Rio de Janeiro

L2: Microstructure and Corrosion Resistance of Laser Welded TP347HFG and VM12-SHC Stainless Steels: *Agnieszka Radziszewska*¹; Mieczysław Scendo²; Bogdan Antoszewskic³; ¹AGH University of Science and Technology; ²Jan Kochanowski University in Kielce; ³University of Technology in Kielce

L3: Effect of Low Temperature Thermal Treatment on Mechanical Properties of Electrodeposited Bulk Nanocrystalline Fe-Ni Alloys: *Isao Matsui*¹; Hiroki Mori²; Yorinobu Takigawa²; Tokuteru Uesugi²; Kenji Higashi²; ¹National Institute of Advanced Industrial Science and Technology (AIST); ²Osaka Prefecture University

L4: Microstructure and Mechanical Bahavior of the Al9Si Alloy with Fe Addition: *Renato Baldan*¹; Antonio Couto¹; Jefferson Malavazi²; ¹IPEN -Nuclear Energy Research Institute; ²Escola SENAI Nadir Dias de Figueiredo

L5: Effect of Cu Addition on Microstructures for Ti(C,N)-Mo2C-Ni: *Hiroyuki Hosokawa*¹; Kiyotaka Katou¹; Koji Shimojima¹; Ryoichi Furushima¹; Akihiro Matsumoto¹; ¹National Institute of Advanced Industrial Science and Technology

L6: Study of Behavioral About the Decomposition Reaction of the Solid Solution KFe3(SO4)2-x(CrO4)x(OH)6 in Ca(OH)2 Media: *Ister Mireles*¹; Iván Reyes²; Francisco Patiño¹; Mizraim Flores³; Juan Hernández¹; Sayra Ordoñez¹; Martín¹; ¹Universidad Autónoma del Estado de Hidalgo; ²Instituto de Metalurgia, Universidad Autónoma de San Luis Potosí; ³Escuela Superior de Ingeniería Química e Industrias Extractivas, Instituto Politécnico Nacional

L7: Alkaline Reactivity of Solid Solution of NH4-Na Jarosite with Arsenic: Victor Flores¹; *Francisco Patiño*²; Elia Palacios¹; Mizraim Flores²; Iván Reyes³; Martín Reyes²; Ister Mireles²; Julio Juárez²; ¹Escuela Superior de Ingeniería Química e Industrias Extractivas, Instituto Politécnico Nacional; ²Universidad Autónoma del Estado de Hidalgo; ³Instituto de Metalurgia, Universidad Autónoma de San Luis Potosí

L8: Studies on Ti-Bearing Blast Furnace Slag Remelting to Extract Alumina: Songli Liu¹; ¹Panzhihua University of China

L9: The Evolutions of Aluminum Hydroxide Growth Unit Revealed by Lyophilization Method: *Lijiao Zhou*¹; Zhoulan Yin¹; Zhiying Ding¹; Jun Li¹; Jing Hung¹; ¹Central South University

L10: Coercivity Enhancement of Nd-Fe-B Sintered Magnet by Mo Addition: Jin Woo Kim¹; Won Suk Lee¹; *Jong Min Byun*¹; Se Hoon Kim²; Young Do Kim¹; ¹Hanyang University; ²Korea Automotive Technology Institute

L11: Structural and Optical Properties of Ag-Doped Copper Oxide Thin Films on Polyethylnapthalate (PEN) Substrate: Sayantan Das¹; Zhao Zhao¹; Terry Alford¹; ¹Arizona State University

L12: Hydrogen Absorption-Desorption Properties of Mg/Ti Multi-Layer: *Takuma Hashimoto*¹; Mitsuo Notomi²; ¹Graduate Meiji University; ²Meiji University

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L13: Effect of Sintering Techniques on Mechanical Properties of WC-FeAl Composites: *Ryoichi Furushima*¹; Katou Kiyotaka¹; Koji Shimojima¹; Hiroyuki Hosokawa¹; Akihiro Matsumoto¹; ¹National Institute of Advanced Industrial Science and Technology

L14: Synergistic Effects of Nano-Fillers on Halogen-Free Fire Retardant Polypropylene Composites: *Karnika De Silva*¹; Sudip Ray¹; Mark Taylor¹; Debes Bhattacharyya¹; ¹University of Auckland

L15: Mechanical Properties of Nanostructured TiAlSiN Coatings Deposited By Magnetron Sputtering: Minjae Park¹; Sung-bo Heo¹; Wangryeol Kim¹; Eun-young Choi¹; *Ah-ram Kwon*¹; ¹Korea Institute of Industrial Technology

L16: The Effect of Surface-Coated Diamond Particles on the Grinding Performance of Diamond-Nickel Composite: *Kyungsik Son*¹; Jungheun Moon¹; Inoeck Baek¹; Yonghwan Kim¹; Mansig Lee¹; ¹Korea Institute of Industrial Technology

L17: Feasibility Study on Processing the Carbon Residue from Electrolytic Aluminium by Fluidized Combustion Technology: Junyu Zhou¹; *Chengbo Wu*¹; Jiangbin Zhang¹; Qianjiang Wu¹; ¹Chongqing University

L18: Thermal Properties and Phase Equilibria Analyzed by Gaussian Cluster Variation Method: Yasunori Yamada¹; Tetsuo Mohri¹; ¹Tohoku University

L19: Deposition of á-Alumina Thin Film on Steel and Iron Substrates with Intermediate Chromia Layer: *Toni-Gaye McCulloch*¹; Namgyu Kim¹; Prabhu Doss Mani¹; Hae-Bum Yun¹; Yongho Sohn¹; Kevin Coffey¹; ¹University of Central Florida

L20: Fast Neutron Interactions with Uranium Oxides: Gary Collins¹; *Christopher Shaver*¹; Mattew Cook¹; Craig Kruschwitz²; Thomas Meek¹; ¹University of Tennessee; ²National Security Technologies

L21: Metallurgical processing of Colombian nickel laterites: Sandra Diaz Bello¹; *Adriana Garces Granda*¹; Oscar Restrepo Baena¹; ¹Universidad Nacional de Colombia

L22: Effect of Particle Size on Combustion Characteristics of Elemental Boron: *Kevin Grossman*¹; David Reid¹; Sudipta Seal¹; Eric Petersen²; ¹UCF AMPAC; ²TAMU Department of Mechanical Engineering

L23: Use of Extract of Cupressus Goveniana for Synthesis and Stabilization of Silver Nanoparticles: *Laura Garcia*¹; Diana Arenas¹; Mizraim Flores¹; Pedro Ramirez¹; Luis García¹; ¹Universidad Tecnológica de Tulancingo

L24: Synthesis of Bimetallic Nanoparticles Urchin-Like with Ricinus Communis Leaf Extract: Laura Garcia¹; Diana Arenas¹; Mizraim Flores¹; Pedro Ramirez¹; Luis García¹; ¹Universidad Tecnológica de Tulancingo

L 25: Interaction between Competing Factors Influencing Void Nucleation in Pure Iron during Self-Ion-Bombardment: *Jonathan Gigax*¹; Lloyd Price¹; Tianyi Chen¹; Lin Shao¹; Frank Garner²; ¹Texas A&M University; ²Radiation Effects Consulting

L26: Tungsten Doped Gallium Oxide Thin Films for High Temperature Oxygen Sensors: *Ernesto Rubio*¹; Alejandro Miranda-Gallardo¹; Ramana Chintalapalle¹; ¹University of Texas at El Paso

L27: Stoichiometric Effects on the Properties of Cerium Oxides: Alexandra Rajic¹; Christopher Shaver¹; *Thomas Meek*¹; Craig Kruschwitz²; ¹University of Tennessee; ²National Security Technologies

L28: A Study on the Safety of Tank Vehicles: *Sung Cheol Yoon*¹; ¹Korea Railroad Research Institute/New Transportation Systems Research Center

L29: Synthesis and Characterization of the Spinel ZnCr2-xFexO4 as Nanostructured Pigment: Juan Montoya¹; Andres Chavarriaga²; Oscar Jaime Restrepo²; ¹Lasallista University Corporation; ²National University of Colombia

L30: Microstructural Evaluation of the DEAP Material after Stress Relaxation Cycles: *Boon-Chai* Ng¹; Gunnar Lovhoiden¹; James Magbanua¹; Cody Rieger¹; ¹Andrews University

L31: Effects on Combustion Process of Pulverized Coal Adding Biomass Char: *Bingchang Li*¹; ¹Shaanxi Energy Vocational and Technological College L32: Coarsening of Decomposed Phases in Cu-Ni-Cr Alloys: *Victor Lopez-Hirata*¹; Felipe Hernandez-Santiago¹; Maribel Saucedo-Muñoz¹; Hector Dorantes-Rosales¹; Jose Villegas-Cardenas²; Jorge Gonzalez-Velazquez¹; ¹Instituto Politecnico Nacional (ESIQIE); ²Universidad Politecnica del Valle de Mexico

L33: Effect of V Addition on the Microstructural Properties of Gas Atomized Hypereutectic Al-20Si-5Fe Alloys: *Muhammed Kilicaslan*¹; ¹Kastamonu University

L34: Fabrication of Barrierless Cu-Alloy Film for Industrial Applications: *Chon-Hsin Lin*¹; ¹Asia-Pacific Institute of Creativity/Biotechnology

L35: echanical and Biological Behaviors of a Zr-Al-Fe-Cu Bulk Metallic Glass for Stent Applications: *Lu Huang*¹; Chao Pu¹; Deidra Mountain¹; Wei Wu¹; Wei Zhang²; Peter Liaw¹; Yanfei Gao¹; Wei He¹; ¹The University of Tennessee; ²Dalian University of Technology

L36: Fabrication of High Purity Quartz Sand Using Microwave Heating and Hot Chlorination: Jong Ho Kim¹; ¹Research Institute of Industrial Science and Technology

L37: A Study of Metallurgical Factors for Defect Formation in Electric Resistance Welded API Steel Pipes: *Min Sung Joo*¹; Kyung-Min Noh¹; Wan-Keun Kim¹; Jin-Ho Bae¹; Chang-Sun Lee¹; ¹POSCO

L38: A Study on Corrosion Behavior of STS316 and STS430 by CrN Coating Treatment with on the Similar Fuel-Cell Environment: *Min Seok Moon*¹; Myeong Han Yoo¹; Je Ha Oh¹; Shin Jae Kang²; Kee Do Woo²; Young Choi³; ¹Korea Institute of Carbon Convergence Technology; ²Jeonbuk National University; ³KITECH

L39: Variation of Emotional Color of Cu Alloys with Its Compositions and Surface Morphology: *Hyo-Soo Lee*¹; Hai-Joong Lee¹; Hyung-Won Shin¹; Taek-Kyun Jung¹; ¹KITECH

L40: Synthesis of Copper Nanoparticles by the Chemical Reduction Method in the Liquid-Phase: *Taishi Yamaoka*¹; ¹Waseda University

L41: Microstructural Characterization of DP600 Steel Sheet Subject to the Nakazima Test and Electrohydraulic Forming: *Brent McCallum*¹; Javad Samei¹; Daniel Green¹; Randy Bowers¹; ¹University of Windsor

L42: A Non-Contact Means of Thermo-Mechanical Testing of Materials beyond 2000 °C: *Chase Smith*¹; Nicholas De Leon¹; Gregory Thompson¹; ¹The University of Alabama

L43: Quasiperiodic Graphene Structures: *Eudenilson Albuquerque*¹; Manoel Vasconcelos¹; Luciano da Silva¹; ¹Universidade Federal do Rio Grande do Norte

L44: Optoelectronic Properties of \947-Cd(OH)₂: Umberto Fulco¹; Eudenilson Albuquerque¹; Carlos Barboza¹; ¹Universidade Federal do Rio Grande do Norte

L45: Joining Process of Gamma-TiAl and Structural Steels by Friction Welding Method: *Myung-Hoon Oh*¹; Jong-Moon Park¹; Ho-Seung Jang¹; No-Jin Park¹; Ki-Young Kim²; Kyung-Kyun Kim²; ¹Kumoh National Institute of Technology; ²KIMS

L46: Rare Earth Element Recovery Using Composite Resin Systems: *Maureen Chorney*¹; Sean Dudley¹; ¹Montana Tech

L47: Experimental and Theoretical Analysis of Railway Brake Disc during Braking: *Jeongguk Kim*¹; Jae-Yong Lim¹; ¹Korea Railroad Research Institute

L48: Severe Plastic Deformation as a Process for Enhancing Structural Integrity of Additively Manufactured Materials

: Todd Book1; Michael Sangid1; Srinivasan Chandrasekar1; 1Purdue University

L49: Thermodynamic Study and Phase Diagram Calculations of Organic Thermal Energy Storage Materials: *Renhai Shi*¹; Wen-Ming Chien¹; Dhanesh Chandra¹; Amrita Mishra²; Wesley Munson¹; ¹University of Nevada, Reno; ²Iowa State University

L50: A Computer Simulation of Microstructural Evolution of Li Metal Anode during Charging and Discharging: A Phase Field Approach: Dong-Uk Kim¹; Pil-Ryung Cha¹; ¹Kookmin University System at PT Inalum, Indonesia: Muhammad Syafri Sunardi; S. Sijabat¹; E. Ivan¹; Ade Buandra; D Kusnandar²; ¹PT. Indonesia Asahan Aluminium (INALUM); ²PT Indonesia Asahan Aluminium

L52: Dynamic Mechanical and Optical Response of Dielectric Mirrors and Optical Microcavities: *David Scripka*¹; Garrett Lecroy¹; Christopher Summers¹; Naresh Thadhani¹; ¹Georgia Institute of Technology

L51: Increasing of Productivity by Optimization of Alumina Feeding

L53: Plasma Sprayed Edge Functionalized Graphene Oxide Reinforced Nano-alumina Composite Coatings for Anti-Corrosion Applications: *Shashank Saraf*¹; Ankur Gupta¹; David Ward¹; Swetha Barkam¹; Jeff Bullington²; Sudipta Seal¹; ¹University of Central Florida; ²Garmor Tech

L54: Formation of MnCr2O4 Spinel Oxide in a 9Cr Oxide Dispersion Strengthened Steel: Xue Hu¹; Wei Yan; Wei Wang; *Yiyin Shan*¹; Ke Yang; ¹Institute of Metal Research, Chinese Academy of Sciences

L55: Synthesis of Metastable NiGe2 by Mechanical Alloying: Ahmed Al-Joubori¹; C. Suryanarayana¹; ¹University of Central Florida

L56: Behavior of Swelling Elastomers in Water, Oil, and Acid: Sayyad Qamar¹; M. Akhtar²; Tasneem Pervez¹; ¹Sultan Qaboos University; ²NED University of Engineering and Technology

L57: Performance Improvement of Metal Extrusion Dies: Sayyad Qamar¹; ¹Sultan Qaboos University

L58: Identification of Cr-Y-O Nano-Cluster in a 14Cr Oxide Dispersion Strengthened Steel: Xue Hu¹; Wei Yan; Wei Wang; *Yiyin Shan*¹; Ke Yang; ¹Institute of Metal Research, Chinese Academy of Sciences

High-Entropy Alloys III — HEAs Special Poster

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee Program Organizers: Peter Liaw, University of Tennessee; Gongyao

Wang, University of Tennessee; Michael Gao, National Energy Technology Lab; Suveen Mathaudhu, University of California Riverside

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C14: Characterization of a High Strength, Refractory High Entropy Alloy, AlMo_{0.5}NbTa_{0.5}TiZr, Utilizing Spatially Resolved Energy Dispersive X-ray (EDX) Spectroscopy and STEM-HAADF 3D Tomography: *Jacob Jensen*¹; John Sosa¹; Gopal Viswanathan¹; Daniel Huber¹; Robert Williams¹; Oleg Senkov²; Hamish Fraser¹; ¹The Ohio State University; ²Air Force Research Lab

C15: Effect of Annealing on Phase Composition and Microstructure of the CoCrFeNiMnVx (x=0, 0.25, 0.5, 0.75, 1) High Entropy Alloys: *Nikita Stepanov*¹; Dmitry Shaysultanov¹; Gennady Salishchev¹; Mikhail Tikhonovsky²; Oleg Senkov³; ¹Belgorod State University; ²National Science Center "Kharkov Institute of Physics and Technology" NAS of Ukraine; ³UES, Inc.

C16: High Temperature Mechanical Properties of High Entropy Alloys Evaluated by Instrumented Indentation Test: *Hyun Seok Oh*¹; Jin Yeon Kim¹; Jong Hyoung Kim¹; Dong Il Kwon¹; Eun Soo Park¹; ¹Seoul National University

C17: Microstructural Evaluation of Ni-Superalloy Based High Entropy Systems: *Joseph Licavoli*¹; Paul Jablonski¹; John Sears¹; Jeffrey Hawk¹; ¹Department of Energy

C18: Microstructural Evolution of Cu/CoCrFeNi High Entropy Alloy Composite under Electron Irradiation: Jinyeon Kim¹; *Hyunseok Oh*¹; Seung Jo Yoo²; Jonghan Won²; Eun Soo Park¹; Hye Jeong Chang³; ¹Research Institute of Advanced Materials, Department of Materials Science and Engineering, Seoul National University; ²Korea Basic Science Institute; ³Advanced Analysis Center, Korea Institute of Science and Technology **C19: Temperature Dependence of the Mechanical Properties of Equiatomic Solid Solution Alloys with FCC Crystal Structures**: *Zhenggang Wu*¹; Hongbin Bei²; George Pharr¹; Easo George²; ¹University of Tennessee; ²Oak Ridge National Laboratory

C20: The Influence of Alloy Composition on Phase Stability and Mechanical Properties of Laser Deposited AlTiFeCrCu Alloys: *Kyle Johnson*¹; Mark Horstemeyer¹; Cassie Bennett¹; Denver Seely¹; ¹Mississippi State University

Hume-Rothery Award Symposium: Multicomponent Alloy Metallurgy, the Bridge from Materials Science to Materials Engineering — Poster Session

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Alloy Phases Committee

Program Organizers: Ursula Kattner, National Institute of Standards and Technology; Mark Asta, University of California at Berkeley; Raymundo Arroyave, Texas A&M University

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G40: CALPHAD Thermodynamics, Phase Stability and Phase Transformations in Complex Actinide-Based Alloys: Aurelien Perron¹; Patrice Turchi¹; Alexander Landa¹; Benoit Oudot²; Brice Ravat²; Francois Delaunay²; ¹Lawrence Livermore National Laboratory; ²CEA-Centre de Valduc

G41: Interdiffusion and Reaction in Binary Al vs. Zr and Ternary Al-Si vs. Zr Diffusion Couples: *Abhishek Mehta*¹; Dennis Keiser²; Yongho Sohn¹; ¹University of Central Florida; ²Idaho National Laboratory

G42: Interdiffusion in Ni-Mn-Ga Alloys: *Le Zhou*¹; Anit Giri²; Kyu Cho³; Yongho Sohn¹; ¹University of Central Florida; ²TKC Global; ³US Army Research Laboratory

G43: Interdiffusion in Ternary Magnesium Solid Solutions of Aluminum and Zinc: *Catherine Kammerer*¹; Nagraj Kulkarni²; Bruce Warmack²; Yongho Sohn¹; ¹University of Central Florida; ²Oak Ridge National Laboratory

G44: Investigating Pattern Formation during Three-Phase Eutectic Solidification in Three Dimensions Using Experiments and Phase-Field Simulations: *Abhik Choudhury*¹; ¹Institute of Materials and Processes

G45: Multicomponent Manganese Silicides in a General Calphad Approach: Jean Claude Tedenac¹; Alexandre Berche¹; Philippe Jund¹; ¹University Montpellier

G46: Simulation of Fe-Cr-X Alloys Exposed to Oxyfuel Combustion Atmospheres at 600°C: Andre Costa E Silva¹; Daniel Coelho²; Axel Kranzmann³; Fernando Rizzo Assuncao²; ¹EEIMVR - Universidade Federal Fluminense - IBQN; ²PUC Rio; ³BAM Berlin

G47: Random Walk of a Solute Loaded Grain Boundary: Moneesh Upmanyu¹; Changjian Wang¹; ¹Northeastern University

G48: Revisiting Boron-Carbon-Hafnium-Zirconium Thermodynamics: *Theresa Davey*¹; Suzana Fries²; Michael Finnis¹; Alan Dinsdale³; ¹Imperial College London; ²Ruhr-Universität Bochum; ³National University of Science and Technology "MISIS"

G49: The Itinerant Coherent Potential Approximation for Phonons: Role of Fluctuations for Systems with Magnetic Disorder: *Biswanath Dutta*¹; Fritz Körmann¹; Tilmann Hickel¹; Subhradip Ghosh²; Biplab Sanyal³; Jörg Neugebauer¹; ¹Max-Planck-Institut für Eisenforschung GmbH; ²Indian Institute of Technology Guwahati; ³Angstromlaboratoriet, Uppsala University

LMD 2015 Technical Division Student Poster Contest — LMD 2015 Student Poster Contest - Graduate Sponsored by: TMS Light Metals Division

Monday PM March 16, 2015

Room: Atlantic Hall Location: Dolphin

SPG-14: Study of Aluminum Matrix Composite (AMC) Used in the Deposition of Thin Films by RF Sputtering Magnetron: Ulises Barajas¹; Anthony Rivera¹; Marcelo Suárez¹; ¹University of Puerto Rico

SPG-15: Texture Weakening of AZ31 Mg Alloy Sheet by Low Temperature Rolling and Subsequent Annealing: *Jing Su*¹; Abu Syed Humanuar Kabir¹; Mehdi Sanjari¹; In-ho Jung¹; Steve Yue¹; Hiroshi Utsunomiya²; ¹McGill; ²Osaka University

LMD 2015 Technical Division Student Poster Contest — Undergraduate

Sponsored by: TMS Light Metals Division

Nonday PM	Room: Atlantic Hall
March 16, 2015	Location: Dolphin

SPU-6: Recrystallization of a Biodegradable Mg-Ca-Sr Alloy: *Matthew Wener*¹; Ida Berglund¹; Hunter Henderson¹; Michele Manuel¹; ¹University of Florida

SPU-7: Study of Thermo Mechanical Properties of a Novel Al-Zn Composite Reinforced with Boride Particles: *Jose Colon Quintana*¹; Sujeily Soto¹; Oscar Suarez¹; ¹UPRM

LMD 2015 Technical Division Young Professional Poster Contest

Sponsored by: TMS Light Metals Division, TMS: Young Professionals Committee

Monday PM	Room: Atlantic Hall
March 16, 2015	Location: Dolphin

YP-6: A Study on Mechanical Properties of Particulate Reinforced 6063 Aluminium Alloy: Osoba Lawrence¹; Philip Achuzia¹; ¹University of Lagos

YP-7: DC Casting of 3003 Alloy Clad by 4045 Alloy: *Jianzhong Cui*¹; ¹Key lab. of EPM, Northeastern University

YP-8: Formation of Long Periodic Stacking Ordered Structures (LPSOs) in Mg-Zn-Y Alloys Through Inversed Martensite Transformation: *William Wang*¹; Shunli Shang¹; Yi Wang¹; Hongyeun Kim¹; Kristopher Darling²; Laszlo Kecskes²; Xidong Hui³; Suveen Mathaudhu⁴; Zi-Kui Liu¹; ¹The Pennsylvania State University; ²US Army Research Laboratory; ³University of Science and Technology Beijing; ⁴University of California - Riverside

YP-9: Microstructural Evaluation and Mechanical Properties of a Spray-Cast Aluminum Alloy Processed by Severe Plastic Deformation: *Shima Sabbaghianrad*¹; Terence Langdon¹; ¹University of Southern California

Magnesium Technology 2015 — Poster Session

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: Michele Manuel, University of Florida; Martyn Alderman, Magnesium Elektron; Alok Singh, National Institute for Materials Science; Neale Neelameggham, Ind LLC

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

Session Chairs: Michele Manuel, University of Florida; Alok Singh, National Institute for Materials Science (NIMS)

H19: Effect of Shear Rate on Shape and Size of Solid Particles in AZ91Ca Magnesium Alloy Semi-Solid Slurry: *Yuichiro Murakami*¹; Naoki Omura¹; Mingjun Li¹; Isao Matsui¹; Shuji Tada¹; ¹Advanced Industrial Science and Technology

H20: Effects of Alloying Addition on the Incipient Plasticity and Deformation Behavior of Magnesium Alloys by Spherical Indentation: *Ghazal Nayyeri*¹; Warren J. Poole¹; Chad W. Sinclair¹; ¹University of British Columbia

H21: Formation of ZrO₂ in Coating on AZ31 Mg Alloy Processed by Plasma Electrolytic Oxidation: Kang Min Lee¹; Yeon Sung Kim¹; Ki Ryong Shin¹; Young Gun Ko²; *Dong Hyuk Shin*¹; ¹Hanyang University; ²Yeungnam University

H22: Effects of Trace Elements on Microstructure, Mechanical Properties and Formability of Mg-Li Based Alloys: *Hyeon-Taek Son*¹; Yong-Ho Kim¹; Jung-Han Kim¹; Hyo-Sang Yu¹; ¹Korea Institute of Industrial Technology

H23: Role of Yttrium Solute on Compression Behavior of Mg-Y Alloy: *Tetsuya Ueda*¹; Masaki Nagao¹; Hidetoshi Somekawa²; Alok Singh²; Toshiji Mukai¹; ¹Kobe University; ²National Institute for Materials Science

H24: Study of Extrude-Ability on Different Extrusion Speed and Temperature of Mg-11Li-6Zn-0.6Zr-0.4Ag-0.2Ca Alloy: Yong-Ho Kim¹; Jung-Han Kim¹; Hyeon-Taek Son¹; ¹Korea Institute of Industrial Technology

H25: Analysis of Dislocation Mediated Precipitation in an Mg-Y-Nd Alloy: *Sivanesh Palanivel*¹; Rajiv Mishra¹; Raymond Brennan²; Kyu Cho²; ¹University of North Texas; ²U.S. Army Research Laboratory

H26: Characterization of Interdiffusion and Reaction Products in the Mg-Gd System: *Catherine Kammerer*¹; Kyu Cho²; Yongho Sohn¹; ¹University of Central Florida; ²US Army Research Laboratory

H27: Polycrystalline Modelling of Extruded Magnesium Mechanical Responses during Dynamic Loading: Farhoud Kabirian¹; Akhtar Khan¹; ¹University of Maryland, Baltimore County

H28: The Development Manufacturing Process for the Commercial Vehicle's Arm-Rest with the High-Vacuum High-Pressure Die-Casting Process: *Min Seok Moon*¹; Myeong Han Yoo¹; Sang Yoap Oh¹; Je Ha Oh¹; Shin Jae Kang²; ¹Korea Institute of Carbon Convergence Technology; ²Jeonbuk National University

H29: High Temperature Deformation Behaviour of AZ31 Alloy in Tension and Compression: *K.P. Rao*¹; K. Suresh¹; Y.V.R.K. Prasad²; ¹City University of Hong Kong; ²processingmaps.com

H30: The Effect of Micro and Macro Galvanic Current on Cerium Conversion Coatings: Surender Maddela¹; Matt O'Keefe¹; ¹Missouri University of Science and Technology

H31: Plasma Electrolytic Oxidation Coating of 1000Hv Hardness on Mg Alloys: Yonghwan Kim¹; Eunsol An¹; Eunyoung Choi¹; Uoochang Jung¹; ¹Korea Institute of Industrial Technology

H32: Investigating Reversible Hysteresis In Magnesium Single Crystals Using A Spherical Tip Under Nanoindentation: Justin Griggs¹; ¹Drexel University

H33: Squeeze Casting of Magnesium Alloy AM60 Refined by C2Cl6: Yanda Zou¹; Xuezhi Zhang¹; Henry Hu¹; Li Fang¹; ¹University of Windsor

H34: Friction Welding of Aluminum to Magnesium: A Novel Approach: *G.M. Karthik*¹; G.D. Janaki Ram¹; ¹Indian Institute of Technology Madras

H35: Reversible Plastic Deformation Through Unit-Cell-Reconstruction in Magnesium: *Boyu Liu*¹; Zhi-Wei Shan¹; ¹Xi'an Jiaotong University

H36: Microstructure Evolution of Magnesium Alloys at High Temperature and on Plastic Deformation – In-Situ Quantum Beam Studies in a Materials Oscilloscope: *Klaus-Dieter Liss*¹; Pingguang Xu²; Kun Yan³; Mark Reid⁴; Takahisa Shobu²; Ayumi Shiro²; Shuoyuan Zhang⁵; Hiroshi Suzuki²; Eitaro Yukutake⁶; Stefanus Harjo²; Takuro Kawasaki²; Kazuya Aizawa²; Koichi Akita²; ¹Australian Nuclear Science and Technology Organisation; ²Japan Atomic Energy Agency; ³University of Manchester; ⁴University of Wollongong; and Australian Nuclear Science and Technology Organisation; ⁵Comprehensive Research Organization for Science and Society; ⁶Industrial Technology Institute of Ibaraki Prefecture

H37: Deformation Behavior of Twin-Roll Strip-cast Mg-Zn-Al-Mn Alloys: Sang Jun Park¹; Hwa Chul Jung¹; Kyung Hoon Lee²; Kwang Seon Shin¹; ¹Magnesium Technology Innovation Center / Seoul National University; ²Solution Lab

H38: Anisotropy Investigation of Strips from Twin-Roll Cast AZ31 Magnesium Alloy during Tensile Tests: *Mariia Zimina*¹; Jan Bohlen²; Gerrit Kurz²; Dietmar Letzig²; Michaela Poková¹; Premysl Málek¹; Miroslav Cieslar¹; ¹Charles University in Prague; ²Magnesium Innovation Centre (MagIC) Helmholz Zentrum Geesthacht)

H39: The Processing-Structure-Properties Relationships for Magnesium Alloys during Shear Assisted Indirect Extrusion: *Vineet Joshi*¹; Saumyadeep Jana¹; Arun Devaraj¹; Eric Nyberg¹; Curt Lavender¹; ¹Pacific Northwest National Laboratory

Magnetic Materials for Energy Applications V — Poster Session

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Magnetic Materials Committee

Program Organizers: Francis Johnson, GE Global Research; Raju Ramanujan, Nanyang Technological University; Paul Ohodnicki, National Energy Technology Laboratory

Monday PM	Room: Atlantic Hall
March 16, 2015	Location: Dolphin

Session Chairs: Huseyin Ucar, Oak Ridge National Laboratory; Xiujuan Jiang, Pacific Northwest National Lab

J14: Bulk Combinatorial Assessment of Permanent Magnet Alloys: *Ryan Ott*¹; Jie Geng²; Matthew Besser²; Emrah Simsek²; Matthew Kramer²; ¹Ames Laboratory (USDOE); ²Ames Laboratory (USDOE)

J15: Compression Molding Processing of Alnico-based Permanent Magnets: *Aaron Kassen*¹; Emma White¹; Andriy Palasyuk¹; Lin Zhou¹; William McCallum¹; Iver Anderson¹; ¹Ames Laboratory

J16: Effect of Atomic Order on the Phase Transitions of Melt-Spun Ni₅₀Mn₃₅In₁₅ Ribbons: *Feng Xu*¹; Zhiqin Liao¹; Xiaoping Fei¹; ¹Nanjing University of Science and Technology

J17: Exchange Bias and Magnetic Hardening in $Mn_{1x}Fe_xRu_zSn$: Jason Douglas¹; Juan Castillo¹; Tresa Pollock¹; Ram Seshadri¹; ¹University of California Santa Barbara

J18: Magnetic Properties of Nanocrystalline Microwires: Ahmed Talaat¹; Valentina Zhukova¹; Mihail Ipatov¹; Juan Blanco¹; Rastislav Varga²; Peter Klein²; Blanca Hernando³; Lorena Gonzalez-Legarreta³; *Arcady Zhukov*⁴; ¹Basque Country University, UPV/EHU; ²Institute of Physics, Faculty of Science, University of Pavol Jozef Safarik,; ³Oviedo University; ⁴Basque Country University and Ikerbasque

J19: Magnetostructural Transition in Heusler Mn-Ni-In Melt-Spun Ribbons: *Hongwei Li*¹; Jian Ren¹; Jinke Yu¹; Hongxing Zheng¹; ¹Laboratory for Microstructures, Shanghai University J20: On Magnetocaloric Properties of (Pr, Dy)Fe9 Alloys: Rim Guetari¹; Corneliu Bazil Cizmas²; Lotfi Bessais³; *Najeh Mliki*¹; ¹LMOP, Faculté des Sciences de Tunis, Université de Tunis El Manar; ²Transilvania University of Brasov; ³ICMPE, UMR7182 CNRS-UPEC

J21: Sintering and Characterization of Ni-Mn-Ga Alloy via Spark Plasma Sintering (SPS) and Conventional Routes: *Roozbeh Nikkhah Moshaie*¹; Benjamin Boesl¹; Selva Vennila Raju¹; ¹Florida International University

J22: Magnetization Density Distribution Studies Using the HYSPEC Spectrometer at the Spallation Neutron Source: *Ovidiu Garlea*¹; Barry Winn¹; Melissa Graves-Brook¹; ¹Oak Ridge National Laboratory

Materials and Fuels for the Current and Advanced Nuclear Reactors IV — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Nuclear Materials Committee, TMS: Corrosion and Environmental Effects Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers:* Ramprashad Prabhakaran, Pacific Northwest National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research; Clarissa Yablinsky, Los Alamos National Laboratory

Monday PM	Room: Atlantic Hall
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Session Chair: Ramprashad Prabhakaran, Pacific Northwest National Laboratory

K9: Validation and Numerical Simulation for Shrinkage Porosity of an X12 Steel Ingot: *Zheng Chen*¹; Qijie Zhai²; Jieyu Zhang²; ¹Shanghai University, Tongling University; ²Shanghai University

K10: Reactivity Suppression of Liquid Sodium by Suspended Nanoparticles: *Jun-ichi Saito*¹; Keiichi Nagai¹; Kuniaki Ara¹; ¹Japan Atomic Energy Agency

K11: Irradiation-Induced Microstructural Evolution and Hardening in Grade 92 Steel under the Influence of Fe-ion Irradiation: *Sultan Alsagabi*¹; Indrajit Charit²; ¹KACST; ²University of Idaho

K12: The Effects of Irradiation on China RPV Steel Cleavage Fracture Behavior: *Zhen feng Tong*¹; Guang sheng Ning¹; Chang yi Zhang¹; Wen Yang¹; ¹China Institute of Atomic Energy

K13: Irradiation Damage in Ultra-Fine and Large Grain Zirconium Materials: *Sean Gonderman*¹; TJ Novakowski¹; Osman El- Atwani¹; Sudipta Biswas²; Vikas Tomar²; Sivanandan Harilal¹; Ahmed Hassanein¹; ¹School of Nuclear Engineering, Purdue University; ²School of Aeronautics and Astronautics, Purdue University

K14: Enhanced Irradiation Tolerance of Ultrafine Grained T91 Steel Processed by Equal Channel Angular Extrusion: Miao Song¹; Karl Hartwig¹; Xinghang Zhang¹; ¹Texas A&M University

K15: Serrated Flow in 9–11Cr Ferritic/Martensitic Steels: *Yinzhong Shen*¹; Zhiqiang Xu¹; Jiarui Lu¹; ¹Shanghai Jiao Tong University

K16: Microstructural Study of Dispersoids in Fe-14Cr-0.25Hf and Fe-14Cr-0.25Hf-0.25Y2O3 Spark-Plasma Sintered ODS Alloys: *Yina Huang*¹; Mike Gorley¹; Steve Roberts¹; ¹University of Oxford

K17: Development of Nuclear Quality Components Using Metal Additive Manufacturing: Pedro Frigola¹; Peter Hosemann²; Sara Gaytan³; Ryan Wicker³; *Alejandro Hinojos*³; ¹RadiaBeam Technologies; ²UC Berkeley Department of Nuclear Engineering; ³UTEP, W.M. Keck Center for 3-D Innovation

K18: Effect of Strain and Degree of Sensitization in TGSCC Susceptibility of Stainless Steel in High Temperature: *Carlos Arganis*¹; José Malo¹; ¹Instituto Nacional de Investigaciones Nucleares

K19: Interaction of Selected MAX Phases with Pure Sodium: *Grady Bentzel*¹; Michel Barsoum¹; ¹Drexel University

K20: Interaction of Selected MAX Phases with Pyrolytic Carbon and Silicon Carbide: Grady Bentzel¹; Michel Barsoum¹; ¹Drexel University **K21:** Physical Properties and Corrosion Studies of Titanium Aluminum Carbide Coatings: *Devin Roberts*¹; Yueying Wu¹; Philip Rack¹; Maulik Patel¹; Jonna Partezana²; Robert Comstock²; Kurt Sickafus¹; ¹University of Tennessee; ²Westinghouse Electric Co.

K22: Ductile-Phase-Toughened Tungsten Laminates for Plasma-Facing Materials: *Kevin Cunningham*¹; G. Robert Odette¹; Kirk Fields¹; David Gragg¹; Frank Zok¹; Charles Henager²; Richard Kurtz²; ¹University of California, Santa Barbara; ²Pacific Northwest National Laboratory

K23: Influence of Grain Boundary Character on the Accumulation of Irradiation Damage: *Daniel Foley*¹; Yongqiang Wang²; Jon Baldwin²; Mitra Taheri¹; Garrit Tucker¹; ¹Drexel University; ²Los Alamos National Laboratory

K24: Early Stage Corrosion Study of Zircaloy-4 Inside a Transmission Electron Microscope: *Wayne Harlow*¹; Hessam Ghassemi¹; Mitra Taheri¹; ¹Drexel University

K25: Damage Evolution in Irradiated SiC: Modeling and Experimental Study: *Hao Jiang*¹; Xing Wang¹; Dane Morgan¹; Paul Voyles¹; Izabela Szlufarska¹; ¹University of Wisconsin - Madison

K26: Characterization of a Bending Fatigue Mini-Specimen Technique (Krouse Type) of Nuclear Materials: *Ahmed Haidyrah*¹; Carlos Castano¹; Joseph Newkirk¹; ¹MST

K27: Corrosion Studies on U-Mo Fuel for Research Reactor Applications: *Ramprashad Prabhakaran*¹; Levi Gardner²; Curt Lavender; Vineet Joshi; Douglas Burkes; ¹Pacific Northwest National Laboratory; ²Utah State University

K28: Investigation of Tungsten-Yttrium Based Structural Materials for Nuclear Reactor Applications: *Gustavo Martinez*¹; Ramana Chintalapalle¹; ¹University of Texas at El Paso

Materials Processing Fundamentals — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: James Yurko, Materion Brush Beryllium and Composites; Antoine Allanore, Massachusetts Institute of Technology; Lifeng Zhang, University of Science and Technology Beijing; Jonghyun Lee, University of Massachusetts; Laura Bartlett, Texas State University

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E1: A Technique to Quantify Recrystallization: Panthea Sepehrband¹; Bersabe Morales¹; *Andres Maldonado-Liu*¹; ¹Santa Clara University

E2: Application of Computational Thermodynamics to Steel Processing – The Case of Steel Cleanness: Andre Costa E Silva¹; Livia Goulart²; Ely Araujo²; Rafaela Batista³; Augusto Martins³; ¹EEIMVR - Universidade Federal Fluminense - IBQN; ²VSBM; ³CSN

E3: Characterization of Hot Deformation of 690MPa HSLA Steel for Shipbuilding: *Yong Shuai*¹; Lefei Sun²; ¹China Iron & Steel Research Institute Group; ²Xinyu Iron and Steel Company

E4: CO2 Capture and Conversion Using a Cobalt(III) Schiff Base Complex as a Catalyst at Ambient Conditions: Jun Miao¹; Jilai Xue¹; Jun Zhu¹; Kang Liu¹; *Feng Chang*¹; ¹University of Science and Technology Beijing

E5: Combined Effects of Silicon (Si) and Low Temperature Annealing on the Tensile Properties of Cartridge (70/30) Brass with Nickel (Ni) and Iron (Fe) Contaminants: Adekunle Adegbola¹; Adewale Adegbenjo²; Simeon Ibitoye³; Taiwo Adeboje¹; Olasunkanmi Raji¹; Olufemi Ladiipo¹; ¹The Polytechnic, Ibadan; ²University of Pretoria; ³Obafemi Awolowo University

E6: Correlation of Interfacial Microstructure and Bonding Strength in Roll-Bonded Two-Ply Mg/Al Clad Sheets: *Hyejin Song*¹; Jung-Su Kim¹; Kwang Seok Lee²; Yong Nam Kwon²; Young Won Chang³; Sunghak Lee¹; ¹Center for Advanced Aerospace Materials/POSTECH; ²Korea Institute of Materials Science; ³Graduate Institute of Ferrous Technology/POSTECH **E7: Effect of Lime on Alumina Extracting Property of Calcium Aluminate Slag:** *Bo Wang*¹; Yubing Zhang¹; Lijuan Ma²; Huilan Sun¹; ¹Hebei University of Science and Technology; ²Zhengzhou Railway Vocational and Technical College

E8: Effect of Laminar Cooling Parameters On Martensite Volume Fraction and Mechanical Properties of Hot Rolled Dual Phase Steel: *Sibel Daglilar*¹; Isil Kerti¹; Sinem Yildirim¹; ¹Yildiz Technical University

E9: Effect of Oxide Film at Bubble Surface on Stability of Aluminum Foams in Gas Injection Process: *Yanxiang Li*¹; Yutong Zhou¹; ¹Tsinghua University

E10: Effect of Run Parameters on Force, Slip and Crown in Cold Strip Rolling: *Ahmed Elkholy*¹; A.H. Falah¹; ¹Kuwait University

E11: Effects of Power Ultrasound on Precipitating Process of Silica Particles from Sodium Silicate Solutions: *Tiepeng Li*¹; Jilai Xue¹; Jun Zhu¹; Wenbo Luo¹; ¹University of Science and Technology Beijing

E12: Extraordinary Strain Hardening by Gradient Structure: *Xiaolei Wu*¹; Yuntian Zhu²; ¹Institute of Mechanics, Chinese Academy of Sciences; ²North Carolina State University

E13: Nucleation and Growth in the Equiaxed Zone of Metal Matrix Composites: Alicia Ares¹; Carlos Enrique Schvezov²; ¹CONICET/FCEQyN-UNaM; ²IMAM (CONICET-UNaM)

E14: Numerical and Experimental Studies of Residual Stresses and Eccentricity of Drawn Copper Tubes with Tilted and Shifted Die: *Farzad Foadian*¹; Adele Carrado²; Heinz Palkowski¹; ¹Clausthal University of Technology; ²Institut de Physique et Chimie des Matériaux de Strasbourg

E15: Numerical Investigation on Breakup of Steel-Slag Interface during Ladle Change-Over Process: *Md Irfanul Siddiqui*¹; Pradeep Jha¹; ¹Indian Institute of Technology, Roorkee

E16: Reaction between MnO-SiO2-FeO Oxides with Low FeO Content and Solid Steel Deoxidized by Si and Mn during Heat Treatment: *Chengsong Liu*¹; Jingshe Li¹; Shufeng Yang¹; ¹University of Science and Technology Beijing

E17: Thermodynamic Study on Vanadium Extraction with CO2 and O2 Mixed Blowing: Wei-Tong Du¹; Yu Wang¹; Gang Wen¹; ¹Chongqing University

E18: The Effect of Graphene on the Microstructure and Mechanical Properties of Aluminum/Graphene Produced by HPT: *Liyuan Zhao*¹; Huimin Lu¹; Zhijiang Gao¹; ¹Beihang University

E19: The Extent of Dopant Activation after Microwave and Rapid Thermal Annealing Using Similar Heating Profiles: *Taliya Gunawansa*¹; Zhao Zhao¹; N. Theodore¹; Aprillya Lanz²; Terry Alford¹; ¹Arizona State University; ²Norfolk State University

E20: Prepare for U3O8 from Ammonium Uranyl Carbonate Using Microwave Calcination: *Bingguo Liu*¹; Jinhui Peng¹; ¹Kunming University of Science and Technology

Microstructural Processes in Irradiated Materials — Poster Session

Sponsored by: TMS: Nuclear Materials Committee Program Organizers: Dane Morgan, University of Wisconsin -Madison; Thak Sang Byun, Oak Ridge National Laboratory; Yasuyoshi Nagai, Tohoku University; Zhijie Jiao, University of Michigan; Kai Nordlund, University of Helsinki; Ming-Jie Zheng, University of Wisconsin

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Funding support provided by: Idaho National Laboratory Oak Ridge National Laboratory

C21: Charged Particle Irradiation Studies of High Dose Precipitation in Reactor Pressure Vessel Steels: *Nathan Almirall*¹; Peter Wells¹; Takuya Yamamoto¹; G. Robert Odette¹; Keith Wilford²; Tim Williams²; Kenta Murakami³; Sosuke Kondo⁴; Akihiko Kimura⁴; ¹University of California Santa Barbara; ²Rolls-Royce; ³The University of Tokyo; ⁴Kyoto University

C22: Low Dose Proton Irradiation Creep of FM Steel T91: *Cheng Xu*¹; Gary Was; ¹University of Michigan

C23: Modeling of Tensile Deformation and Ductile Damage Evolution in Irradiated Ferritic/Martensitic Steels: *Pritam Chakraborty*¹; S. Bulent Biner¹; ¹Idaho National Laboratory

C24: A Hierarchical Model for Radiation Defect Accumulation and Hardening: *Aaron Dunn*¹; Laurent Capolungo¹; Remi Dingreville²; ¹Georgia Institute of Technology; ²Sandia National Laboratory

C25: Segregation Behaviour of Transmutation Elements Ca, Ti, Sc in the F82H Steel Irradiated under Mixed Spectrum Irradiation of High Energy Protons and Spallation Neutrons: *Cristelle Pareige*¹; Viacheslav Kuksenko²; Philippe Pareige¹; Yong Dai²; ¹University of Rouen; ²PSI

C26: Swelling, Grain Stability and Hardness Changes of Several Variants of Ferritic Alloy EK-181 at Doses of 100 to 600 dpa during Self Ion Irradiation: *Eda Aydogan*¹; T. Chen¹; D. Chen¹; J. Gigax¹; X. Wang¹; C.C. Wei¹; L. Shao¹; P.S. Dzhumaev²; O.V. Emelyanova²; M.G. Ganchenkova²; B.A. Kalin²; M. Leontiva-Smirnova³; R. Valiev⁴; N. Enikeev⁴; M. Abramova⁴; Y. Wu⁵; W.Y Lo⁵; Y. Yang⁵; M. Short⁶; F.A. Garner⁷; ¹Texas A&M University; ²Moscow Engineering and Physics Institute; ³Bochvar institute of Inorganic Chemistry; ⁴Institute of Physics of Advanced Materials and Nanocenter; ⁵University of Florida; ⁶Massachusetts Institute of Technology; ⁷Radiation Effects Consulting

C27: Microstructure and Mechanical Property Evolution during Tube Processing of Oxide Dispersion Strengthened (ODS) Ferritic Steels: *Eda Aydogan*¹; O. Anderoglu²; S.A. Maloy²; K. Clarke²; C.A. Yablinsky²; T. Saleh²; G.R. Odette³; D. Hoelzer⁴; J.J. Lewandowski⁵; I.E. Anderson⁶; J.R. Rieken⁶; C. Lavender⁷; ¹Texas A&M University; ²Los Alamos National Laboratory; ³University of California, Santa Barbara; ⁴Oak Ridge National Laboratory; ⁵Case Western Reserve University; ⁶Ames Laboratory; ⁷Pacific Northwest National Laboratory

C28: KMC Modeling of Helium Bubble Clustering and Evolution in BCC Iron: *Aaron Oaks*¹; James Stubbins¹; ¹University of Illinois, Urbana-Champaign

C29: Effects of Co-Injected Helium on the Irradiated Microstructure in Ion-Irradiated T91 Steel: *Stephen Taller*¹; Zhijie Jiao¹; Gary Was¹; ¹University of Michigan

C30: Issues Concerning Neutron-Atypical Artifacts Introduced by Ion Irradiation Experiments for Simulation of Neutron Irradiation of Pure Iron: *Lin Shao*¹; Jonathan Gigax¹; Di Chen¹; Tianyi Chen¹; Frank Garner²; ¹Texas A&M University; ²Radiation Effects Consulting

C31: The Strengthening Mechanism Transition in Nanofeatured Ferritic-Martensitic Alloys: *Matthew Swenson*¹; Corey Dolph¹; Janelle Wharry¹; ¹Boise State University **C32:** Incubation Dose for Void Swelling in Ferritic-Martensitic Steels: *Anthony Monterrosa*¹; Elizabeth Getto¹; Zhijie Jiao¹; Gary Was¹; ¹University of Michigan

C33: APT and TEM Investigation of the Evolution of the Microstructure of Ion Irradiated ODS Ferritic Steels: Constantinos Hatzoglou¹; Auriane Etienne¹; *Bertrand Radiguet*¹; Philippe Pareige¹; ¹GPM UMR CNRS 6634 - Université et INSA de Rouen

C34: Characterization of Developed Microstructure of Nanocrystalline Copper Post Neutron and Ion Irradiation: *Walid Mohamed*¹; Marquis Kirk¹; Di Yun¹; Sumit Bhattacharya²; Kun Mo¹; Khaled Youssef³; K.L. Murty³; A.M. Yacout¹; ¹Argonne National Laboratory; ²Northwestern University; ³NC State University

C35: Boundary Character Effect on Void Denuded Zones in Nickel-Chromium: *James Nathaniel*¹; Christopher Barr¹; Khalid Hattar²; Mitra Taheri¹; ¹Drexel University; ²Sandia National Laboratory

C36: Evaluation of Radiation Effects in FeMnNiCr High Entropy Alloy: *Congyi Li*¹; Anantha Phani Kiran Kumar Nimishakavi²; Hongbin Bei²; Yanwen Zhang¹; Brian Wirth¹; Steve Zinkle¹; ¹University of Tennessee; ²Oak Ridge National Laboratory

C37: Analysis of Stress Corrosion Crack Initiation in Neutron-Irradiated 304 Stainless Steel Tested in Simulated PWR Environment: *Maxim Gussev*¹; Kevin Field¹; Jeremy Busby¹; Kale Stephenson; Gary Was²; ¹Oak Ridge National Laboratory; ²University of Michigan

C38: Irradiation-Induced Nanoprecipitation in Ni-W Alloys: *Jae Yel Lee*¹; Calvin Lear¹; Xuan Zhang¹; Pascal Bellon¹; Robert Averback¹; ¹University of Illinois at Urbana-Champaign

C39: Temperature and Irradiation Species Dependence of Radiation Response of Nanocrystalline Silicon Carbide: *Laura Jamison*¹; Kumar Sridharan¹; Steven Shannon²; Izabela Szlufarska¹; ¹University of Wisconsin-Madison; ²North Carolina State University

C40: Damage Evolution in Irradiated SiC: Modeling and Experimental Study: *Hao Jiang*¹; Xing Wang¹; Dane Morgan¹; Paul Voyles¹; Izabela Szlufarska¹; ¹University of Wisconsin - Madison

C41: Evolution of Black Spots Defects and Small Clusters in Irradiated 3C-SiC: *Cheng Liu*¹; Yizhang Zhai²; Li He²; Beata Tyburska-Püschel¹; Paul Voyles²; Kumar Sridharan¹; Dane Morgan¹; Izabela Szlufarska¹; ¹Department of Engineering Physics, University of Wisconsin – Madison; ²Department of Materials Science and Engineering, University of Wisconsin – Madison

C42: Irradiation Effects on Fission Product Diffusion in SiC: *Shyam Dwaraknath*¹; Gary Was¹; ¹University of Michigan

C43: Radiation-Enhanced Impurity and Self-Diffusion in Nitrides by Atomistic Study: *Zhi-Gang Mei*¹; Abdellatif Yacout¹; Bei Ye¹; Yeon Soo Kim¹; Gerard Hofman¹; Marius Stan¹; ¹Argonne National Laboratory

C44: Ion Irradiation Induced Defects in Boron Carbide: *Feifei Zhang*¹; Lumin Wang¹; ¹University of Michigan

C45: Atomistic Characterization of Uranium Vacancy Interaction with External Strains and Dislocations in Uranium Dioxide: *Anuj Goyal*¹; Gopinath Subramanian²; David A. Andersson²; Chris R. Stanek²; Simon R. Phillpot¹; Blas P. Uberuaga²; ¹University of Florida; ²Los Alamos National Laboratory

C46: Thermal Boundary Resistance and Irradiation Effects of the Grain Boundaries in Ceria: Aleksandr Chernatynskiy¹; Xianming Bai²; Jian Gan²; ¹University of Florida; ²INL

C47: Short-Range Atomic Order in Ion-Tracks in Pyrochlores: *Ritesh Sachan*¹; Yanwen Zhang¹; M. F. Chisholm¹; W.J. Weber²; ¹Oak Ridge National Laboratory; ²University of Tennessee

C48: Investigations on Radiation Tolerance of Mn+1AXn Phases: Study of Ti3SiC2, Ti3AlC2, Cr2AlC, Cr2GeC, Ti2AlC and Ti2AlN: *Jingren Xiao*¹; ¹State Key Lab. of Nuclear Physics & Technology Institute of Nuclear Science and Technology School of Physics, Peking University

POSTERS

C49: Stability of Nanocluster and Nanoparticle Systems Embedded in Dielectric Substrates: *Paulo Fichtner*¹; Mariana Timm¹; Zacarias Fabrim¹; Daniel Baptista¹; Gustavo de Azevedo¹; ¹Universidade Federal do Rio Grande do Sul

C50: Atom-Probe Tomographic Study of the Microstructure of an Irradiated Uranium-7 Weight Percent Molybdenum Alloy.: *Sumit Bhattacharya*¹; Sung IL Baik¹; David Seidman¹; Abdellatif Yacout²; Michael Pellin²; Yun Di²; Bei Ye²; Kun Mo²; Walid Mohamed²; ¹Northwestern University; ²Argonne National Laboratory

C51: Self-Irradiation Effects on Metallurgical Properties of Plutonium Alloys: *Brandon Chung*¹; Kenneth Lema¹; Patrick Allen¹; ¹Lawrence Livermore National Laboratory

C52: Ion-Beam Irradiation Assisted Microstructure Control in Refractory Metal Films: *Huan Ma*¹; Matteo Seita²; Alla Sologubenko¹; Ralph Spolenak¹; ¹ETH Zurich; ²MIT

C53: Modelling Void Swelling Suppression by Injected Interstitials and Free Surfaces in Ion Irradiation: *Michael Short*¹; Yang Yang¹; Di Chen²; Lin Shao²; Frank Garner³; ¹MIT; ²Texas A&M; ³Radiation Effects Consulting

C54: Real Time and In Situ Studies of Materials in a Radiation Environment (MRE): *David Sprouster*¹; Eric Dooryhee¹; Simerjeet Gill¹; Lynne Ecker¹; ¹Brookhaven National Laboratory

C55: Effects of Neutron and Ion Irradiation on Zr52.5Cu17.9Ni14.6Al10Ti5 (BAM-11) Bulk Metallic Glass: *Jamieson Brechtl*¹; Alejandro Perez-Bergquist¹; Hongbin Bei²; Steven Zinkle¹; ¹University of Tennessee; ²Oak Ridge National Laboratory

C56: Some Remarks on In-Situ Studies Using TEM-Heavy-Ion Accelerator Link from the Stand Point of Extracting Radiation Damage Caused by Fast Neutrons: *Shiori Ishino*¹; ¹University of Tokyo

C57: Atomic Scale Details of Defect-Boundary Interactions: *Di Chen*¹; Lin Shao¹; ¹Texas A&M University

C58: Examination of Uncertainty in Kinetic Monte Carlo Simulations of bcc Metals: *Richard Hoffman III*¹; Chaitanya Deo¹; ¹Georgia Institute of Technology

MPMD 2015 Technical Division Student Poster Contest — Graduate

Sponsored by: TMS Materials Processing and Manufacturing Division

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SPG-16: Controlling the Orientation of Nano-twined Cu Thin Film Deposited by Unbalanced Magnetron (UBM) Sputtering: *Hsin-Yuan Chen*¹; Kai-Hung Yang¹; Fan-Yi Ouyang¹; ¹National Tsing Hwa University, Taiwan

SPG-17: A Novel Sin-Hyperbolic Multistage Creep Deformation and Damage Model Analysis: *Mohammad Shafinul Haque*¹; Calvin Stewart¹; ¹University of Texas El Paso

SPG-18: Ab-initio Simulations of Al-Si based Alloys in the Liquid State: *Tara Power*¹; Jeffrey Hoyt¹; Sumanth Shankar¹; ¹McMaster University

SPG-19: Alignment of Microstructural Features in Ceramics through Injection Molding of Ceramic Suspension Gels (CeraSGels) at Room Temperature: *Lisa Rueschhoff*¹; Rodney Trice¹; Jeffrey Youngblood¹; ¹Purdue University

SPG-20: Characterizing Grain Boundary Networks by Algebraic Topology: *Brian Lin*¹; Anthony Rollett¹; Gregory Rohrer¹; ¹Carnegie Mellon University

SPG-21: Fabrication and High Temperature Storage of Ge, Ag/Ge and Cu/ Ge with PbTe Thermoelectric Materials by Rapid Hot-Pressing Method: *Yan-Bin Chen*¹; C. C. Li¹; F. Drymiotis²; L. L. Liao³; M. J. Dai³; C. K. Liu³; C. R. Kao¹; G. J. Snyder²; ¹National Taiwan University; ²California Institute of Technology; ³Industrial Technology Research Institute SPG-22: Interfacial Reaction of Cu and Ag Foil with PbTe and (Pb,Sn) Te for Mid-Temperature Thermoelectric Power Generation Module: *H. T.* Hung¹; C. C. Li¹; F. Drymiotis²; L. L. Liao³; M. J. Dai³; C. K. Liu³; C. R. Kao¹; G. J. Snyder²; ¹National Taiwan University; ²California Institute of Technology; ³Industrial Technology Research Institute

SPG-23: Synthesis of Polymeric Precursors for Refractory Carbides and Borides: *Natalie Kirch*¹; Mark Roll¹; ¹University of Idaho

SPG-24: The Effect of Doping on Ferroelastic Materials: A Moment Invariant Approach: *Lily Nguyen*¹; Dong Wang²; Yunzhi Wang³; Marc De Graef¹; ¹Carnegie Mellon University; ²Xi'an Jiaotong University; ³Ohio State University

MPMD 2015 Technical Division Student Poster Contest — Undergraduate

Sponsored by: TMS Materials Processing and Manufacturing Division

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SPU-9: Characterization of Ni2TiSn Full-Heusler Precipitates in NiTi Based Shape-Memory Alloys for Actuator Applications: *Nicholas Suhar*¹; Oscar Figueroa III¹; Michele Manuel¹; ¹University of Florida

SPU-10: Interfacial Reaction of the Ni/Sn-xZn/Cu Sandwich Couples: Wan-Ching Chen¹; *Mei-Ting Lai*¹; Yee-Wen Yen¹; ¹National Taiwan University of Science and Technology

SPU-11: Interfacial Reactions of the Au/Sn-xZn/Cu Sandwich Structure Couples: Yi-Pin Wu¹; *Jia-Ying Dai*¹; Yee-Wen Yen¹; ¹National Taiwan University of Science and Technology

SPU-12: Precipitation Modeling of Mg₁₇**Al**₁₂ **in Mg-Al Alloys Using TC-Prisma**: *Joshua Wagner*¹; Philipp Alieninov¹; Michele Manuel¹; ¹University of Florida

SPU-13: Study of the Electrical Properties of Biopolymer-Based Composite Containing Ferroelectric Nanoparticles: Nelson Sepúlveda Ramos¹; Amarilis Declet¹; Javier Martínez¹; Oscar Marcelo Suárez¹; ¹UPR Mayaguez

MPMD 2015 Technical Division Young Professional Poster Contest

Sponsored by: TMS Materials Processing and Manufacturing Division and TMS: Young Professionals Committee

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

YP-10: Characterization of Ni2TiSn Full-Heusler Precipitates in High-Temperature NiTi Based Shape-Memory Alloys for Actuator Applications: Nicholas Suhar¹; Oscar Figueroa III¹; Michele Manuel¹; ¹University of Florida

YP-11: Mathematical Modeling of the Effect of Silica Reduction Kinetics in Ladle and Continuous Casting Processes: *Jiwon Park*¹; Richard Fruehan²; Seetharaman Sridhar³; ¹Korea Institute of Materials Science; ²Carnegie Mellon University; ³University of Warwick

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Multiscale Microstructure, Mechanics and Prognosis of High Temperature Alloys — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Computational Materials Science and Engineering Committee, TMS: High Temperature Alloys Committee, TMS: Mechanical Behavior of Materials Committee *Program Organizers*: Mark Tschopp, Army Research Laboratory; Jeffrey Evans, University of Alabama in Huntsville; Jonathan Cormier, ENSMA / Institut Pprime - UPR CNRS 3346; Qiang Feng, University of Science and Technology Beijing

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C59: Experimental Study on the Behaviour of Welding Joints in Uniaxial Tension Using Digital Image Correlation: *Rodrigo de Codes*¹; Pedro Henrique de Mesquita²; ¹UFERSA - Universidade Federal Rural do Semi-Árido; ²IFRN - Instituto Federal do Rio Grande do Norte

C60: Influence of Heat Treatment on γ'Phase and Property of a Directionally Solidified Superalloy: *Pengcheng Xia*¹; Kun Xie¹; Jinjiang Yu²; ¹Shandong University of Science and Technology; ²Institute of Metal Research

Nano- and Micro-Mechanical Measurements in Harsh Environments — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Corrosion and Environmental Effects Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Nuclear Materials Committee *Program Organizers:* Peter Hosemann, University of California Berkeley; Jeffrey Wheeler, EMPA; Verena Maier, Erich Schmidt Institut; Douglas Stauffer, Hysitron

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C61: Electrical Property Tuning via Defect Engineering of Single Layer MoS₂ **by Oxygen Plasma**: Muhammad Islam¹; Narae Kang¹; *Udai Bhanu*¹; Hari Paudel¹; Mikhail Erementchouk¹; Laurene Tetard¹; Michael Leuenberger¹; Saiful Khondaker¹; ¹University of Central Florida

Nanocomposites III — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Composite Materials Committee

Program Organizers: Muralidharan Paramsothy, National University of Singapore, NanoWorld Innovations (NWI); Meisha Shofner, Georgia Institute of Technology; Changsoo Kim, University of Wisconsin-Milwaukee

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F73: Effect of Distribution and Mechanical Properties of Aluminum Composite Reinforced with Nonmetallic Particles Fabricated by CGG Process: *Young-sek Yang*¹; Myoung-sang Lee¹; ¹Foosung Precision Ind. Co., Ltd.

F74: Sustained Progesterone Release from Alginate / Chitosan Magnetic Nanoparticles.: *Ruben Jesus Rodriguez*¹; Melina Leite¹; Mayara Castro¹; Elisa Maria Saitovitch²; ¹Universidade Estadual do Norte Fluminense; ²Centro Brasileiro de Pesquisa Físicas.

F75: Synthesis and Characterization of Varied Packing Density, Platinum-Graphene Nanocomposites for Catalysis in PEM Fuel Cells: Adam Berry¹; Tara Nylese²; *Travis Rampton*²; Matt Nowell²; ¹Cornell University; ²EDAX AMETEK

Neutron and X-Ray Studies of Advanced Materials VIII: Diffraction Limit and Beyond — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: Mechanical Behavior of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Brent Fultz, California Institute of Technology; Peter Liaw, UTK; Jaimie Tiley, Air Force Research Laboratory

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Funding support provided by: Air Force Research Laboratory

B146: Spectral Full-Field Deformation Modeling of Polycrystalline Materials: *Tugce Ozturk*¹; Clayton Stein¹; Reeju Pokharel²; Thom Popovici¹; Robert Suter¹; Franz Franchetti¹; Anthony Rollett¹; ¹Carnegie Mellon University; ²Los Alamos National Laboratory

B147: Investigation of Microstructure and Texture Evolution of ODS Steel at Elevated Temperatures: *Young-Bum Chun*¹; Suk-Hoon Kang¹; Sanghoon Noh¹; Tae Kyu Kim¹; ¹Korea Atomic Energy Research Institute

B148: Residual Stress Determination in Simulated Plant Weldments: *Thomas Watkins*¹; O. Cavin¹; Paris Cornwell¹; John Siefert²; ¹ORNL; ²EPRI

B149: Synchrotron X-ray Powder Diffraction Study of Nanocrystalline Tungsten, Tungsten-Nickel, and Tungsten-Chromium Alloys: *Mohamed Elbakhshwan*¹; Simerjeet Gill¹; Olivia Donaldson²; Jason Trelewicz²; Lynne Ecker¹; ¹Department on Nuclear Science and Technology, Brookhaven National Laboratory; ²Department of Materials Science and Engineering, Stony Brook University

B150: Early Stage of Precipitation in Al-Mg-Si and Related Alloys Examined by Small-Angle Scattering: *Hiroshi Okuda*¹; Yuki Nishizawa¹; Tatsuo Sato²; Yoshinori Kitajima³; ¹Kyoto University; ²Tokyo Inst. Technol.; ³KEK-PF

B151: Atomic/Vacancy Intermixing and Clustering in U(1-y)Nd(y) O(2.00-x) Alloys: *Rozaliya Barabash*¹; Stewart Voit¹; Seung Min Lee²; Travis Knight²; ¹Oak Ridge National Laboratory; ²The University of South Carolina

B152: Recrystallization Texture and Magnetic Properties of Two-Stage Cold Rolled Fe-6.5wt.%Si Thin Sheets: *Yongchuang Yao*¹; Yuhui Sha¹; Jinlong Liu¹; Fang Zhang¹; Liang Zuo¹; ¹Northeastern University

B153: Recrystallization Texture Transition in Fe-2.1wt.%Si Steel by Different Cold Rolling Reduction: *Ning Shan*¹; Yuhui Sha¹; Jinlong Liu¹; Fang Zhang¹; Liang Zuo¹; ¹Northeastern Unversity

B154: Studies of the Amorphous-Crystalline Phase Transition in Metallic Glass Composites Using Synchrotron X-ray and Phase Field Crystal Modelling: *Wei Zhang*¹; Jia Chuan Khong¹; Jiawei Mi¹; ¹University of Hull

B155: A Study of Stress Gradients in a Titanium Alloy Using High Energy Diffraction Microscopy: *Kamalika Chatterjee*¹; Armand Beaudoin¹; Jonathan Lind²; Robert Suter³; Peter Kenesei⁴; Jun-Sang Park⁴; ¹University of Illinois at Urbana-Champaign; ²Lawrence Livermore National Laboratory; ³Carnegie Mellon University; ⁴Argonne National Laboratory

B156: High-Energy X-ray Diffraction Studies on Ni-Zr Using Electrostatic Levitation: *Dante Quirinale*¹; Alan Goldman²; Matthew Kramer¹; Mikhail Mendelev¹; ¹Ames Laboratory; ²Iowa State University

B157: In Situ Observation of Phase Transformation of a Laser-Beam Welded TiAl Alloy during Solidification: *Jie Liu*¹; Peter Staron¹; Stefan Riekehr¹; Andreas Stark¹; Norbert Schell¹; Norbert Huber¹; Andreas Schreyer¹; Martin Müller¹; Nikolai Kashaev¹; ¹Helmholtz-Zentrum Geesthacht, Germany

B158: Micro-XAS Investigation of Interdiffusion and Compound Formation at Buried Al2O3/Ti/W Interfaces for Joining Applications: *Nico Weyrich*¹; Alessandra Beni¹; Mirco Chiodi¹; Sakura Pascarelli²; Christian Leinenbach¹; Lars Jeurgens¹; ¹EMPA - Swiss Federal Laboratories for Materials Science and Technology; ²ESRF - European Synchrotron Radiation Facility

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B159: Microstructural Evolution of the Weld and Heat-Affected Zone in a Laser Beam Welded TiAl-Based Alloy: *Jie Liu*¹; Peter Staron¹; Stefan Riekehr¹; Andreas Stark¹; Norbert Schell¹; Norbert Huber¹; Andreas Schreyer¹; Martin Müller¹; Nikolai Kashaev¹; ¹Helmholtz-Zentrum Geesthacht, Germany

B160: Investigation on Creep Deformation of Ferritic Superalloys with a New Hierarchical Structure Using In-Situ Neutron Diffraction: *Gian Song*¹; Mark Asta²; BjØrn Clausen³; David Dunand⁴; Donovan Leonard⁵; Christian Liebscher²; Michael Rawlings⁴; Zhiqian Sun¹; Gongyao Wang¹; Nhon Vo⁴; Peter Liaw¹; ¹University of Tennessee, Knoxville; ²University of California Berkeley; ³Los Alamos National Laboratory; ⁴Northwestern University; ⁵Oak Ridge National Laboratory

B161: Phase Transformation in a High Flux Magnetic Field: *Roger England*¹; Gerard Ludtka; Peter Kalu; Thomas Watkins; ¹Oak Ridge National Laboratory

Novel Synthesis and Consolidation of Powder Materials — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee Program Organizers: Ma Qian, RMIT University (Royal Melbourne

Institute of Technology); Iver E Anderson, The Ames Laboratory

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D34: The Combined Effects of Alloy Composition and Porosity on Phase Transformation and Mechanical Behaviors of Powder Metallurgy Fe-Cr-Mo Steels: *Jooyoung Park*¹; Jonggyu Jeon¹; Gowoon Jeong¹; Singon Kang¹; Seokjae Lee²; Hyunjoo Choi¹; ¹Kookmin University; ²Chonbuk National University

D35: Preparation of Hexagonal Plate-Like Hematite Particles by Hydrothermal Synthesis and Reduction to Plate-Like Iron Particles: Shusuke Okada¹; Kenta Takagi¹; Kimihiro Ozaki¹; ¹National Institute of Advanced Industrial Science and Technology (AIST)

Pb-Free Solders and Emerging Interconnect and Packaging — Poster Session

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Electronic Packaging and Interconnection Materials Committee *Program Organizers:* John Elmer, LLNL; Yan Li, Intel Corp.; Andre Lee, Michigan State University; Fan-Yi Ouyang, National Tsing Hua University; Srini Chada, Schlumberger; Kyu-Oh Lee, Intel Corp.; Kwang-Lung Lin, National Cheng Kung University; Christopher Gourlay, Imperial College; Daniel Lewis, Rensselaer Polytechnique Institute; Fan Gao, U. Masachusetts Lowell

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Session Chair: Andre Lee, Michigan State University

F76: On the Melting Temperature and Phase Diagram Prediction in the Sn-Rich Corner of Sn-Ag-Cu Nano Alloys: *Ali Roshanghias*¹; Jan Vrestal²; Andriy Yakymovych¹; Herbert Ipser¹; ¹University of Vienna; ²Masaryk University

F77: 3D Structure of Nanoporous Sintered Silver: James Carr¹; Vincenzo Caccuri²; Teruo Hashimoto¹; Séverine Boyer²; Pascal Gadaud²; Michel Gerland²; Peter D Lee¹; George Thompson¹; *Xavier Milhet*²; ¹The Manchester University; ²Pprime Institute UPR CNRS 3346

F78: A First-Principles Investigation of Dislocation Core Properties of □-**tin**: *Mohammad Azarnoush*¹; Mehul Bhatia¹; Gang Lu²; Kiran Solanki¹; ¹Arizona state university; ²California State University Northridge **F79:** Anisotropic Thermal Expansion of Ni₃Sn₄, Cu₆Sn₅ and Beta-Sn: A Powder XRD Study: *Jingwei Xian*¹; Guang Zeng²; Sergey Belyakov¹; Ben Britton¹; Kazuhiro Nogita²; Christopher Gourlay¹; ¹Imperial College London; ²University of Queensland

F80: Characterization of Tin Whiskering and Influence of Microstructure on Its Formation: *Irene Lujan Regalado*¹; Sudhanshu Shekhar Singh¹; Antony Kirubanandham¹; Jason Williams¹; Nikhilesh Chawla¹; ¹Arizona State University

F81: Combined Effects of Solidification Thermal Parameters and Microstructural Features on Mechanical Properties of Directionally Solidified Sn-Sb Lead-Free Solder Alloys: José Marcelino da Silva Dias¹; Thiago Costa¹; Otávio Rocha²; Noé Cheung¹; Amauri Garcia¹; ¹UNICAMP; ²IFPA

F82: Cu-Al Intermetallics for Grain Refinement of Primary Cu6Sn5 in Sn-xCu (x=0.7 to 7.6wt%) Solders: *Kazuhiro Nogita*¹; Guang Zeng¹; Stuart McDonald¹; Jonathan Read¹; Selena Smith¹; Takatoshi Nishimura²; ¹The University of Queensland; ²Nihon Superior Co. Ltd.

F83: Effect of Joint Length on Void Formation and Intermetallic Compound Dissolution for Pb-Free Solders during Electromigration: Chung-hsun Tsai¹; *Tzu-Yu Hsu*¹; Fan-Yi Ouyang¹; ¹National Tsing-Hua University

F84: Effect of Temperature Gradient on the Growth of Ag3Sn Intermetallic Compounds in Pb-Free Solder during Thermo-Compressive Bonding Process: *Hsin-Yuan Chen*¹; Yu-Ping Su¹; Chun-Sen Wu¹; Kuan-Neng Chen¹; Fan-Yi Ouyang¹; ¹National Tsing Hwa University, Taiwan

F85: Effect of Volume Confinement on the Formation of Void in Solder Joint: *Minyoung Kim*¹; Yoonki Sa¹; Huandi Gu¹; Choong-un Kim¹; ¹University of Texas at Arlington

F86: Electromigration Failure Modes of Microbumps with Different Underbump Metallizations in 3D IC Packaging: *Shu-Han Chao*¹; Chih Chen¹; Chau-Jie Zhan²; Yu-wei Huang²; ¹National Chiao Tung University; ²Assembly and Reliability Department/EOL/ITRI

F87: Improvement of Thermal Fatigue Property at Bi Based Alloy: *Minoru Ueshima*¹; ¹Senju Metal Industry

F88: Influence of Nano-Structured Modifiers on Mechanical Reliability of Sn-Cu Solder Alloys: *Yang Lu*¹; KN Subramanian¹; Andre Lee¹; ¹Michigan State University

F89: Investigating the Grain Structure of Beta-Tin in Pb-Free Solder Joins with Ni-Based and Cu-Based Substrates via Electron Backscattered Diffraction: *Tzu-Ting Chou*¹; Wei-Yu Chen¹; Cheng-Ying Ho¹; Hsiu-Min Lin¹; ¹National Tsing Hua University

F90: Joint Property of Sn-Cu-Cr(Ca) Middle Temperature Solder for High Reliability of Automobile ECU: Junghwan Bang¹; Young-Ho Ko¹; Chang-Woo Lee¹; ¹Korea Institute of Industrial Technology(KITECH)

F91: Optimization of AuSn Eutectic Bonding Using Thermal Evaporation Process: *Eyup Demir*¹; Inci Donmez¹; Mustafa Torunbalci¹; Tayfun Akin¹; Eren Kalay¹; ¹METU

F92: Phase Equilibria in the Bi-Rich Corner of the Ag-Bi-Ni System: *Przemyslaw Fima*¹; Katarzyna Berent¹; Grzegorz Garzel¹; Adela Zemanova²; ¹Institute of Metallurgy and Materials Science, Polish Academy of Sciences; ²Institute of Physics of Materials, Academy of Sciences of the Czech Republic

F93: Plasma Organic Surface Finish – Solder Wettability and Multi-**Reflow Properties**: *Kyoung-Ho Kim*¹; Wonil Seo¹; Hyun-Hwa Park²; Nam-Sun Park²; Sehoon Yoo¹; ¹Advanced Welding & Joining R&BD Group, Korea Institute of Industrial Technology; ²Jesaki Hankook Ltd.

F94: Solder Joint Reliability of Sn-48Bi-2Ag Ribbon for Solar Cell Module: *Won Sik Hong*¹; No Chang Park¹; Cul Min Oh¹; A Young Kim¹; Ju Hee Kim¹; ¹Korea Electronics Technology Institutue(KETI)

F95: Study of Low Melting Sn-Bi-xGa Solder Alloy: *Zhi-Hao Chen*¹; Albert Wu¹; ¹National Central University

F96: The Conditional Probability Density Distribution Surface of the Pb-Free Solder Joint Fatigue Properties under Board Level Drop Impact: *Jian Gu*¹; Yongping Lei¹; Hanguang Fu¹; Jian Lin¹; Limin Ma¹; ¹Beijing University of Technology

F97: Viscosity Studies of Liquid Nano-Composite Sn-Ag-Cu Alloys: *Andriy Yakymovych*¹; Ali Roshanghias¹; Herbert Ipser¹; ¹University of Vienna

F98: Effect of the Addition of Neodymium and Praseodymium in Lead-Free Solder Tin-Silver-Bismuth, on the Microstructure and Growth Kinetics of Intermetallic Layer of the Soldered Joints: *Miguel Neri*¹; Alberto Martinez-Villafane¹; Caleb Carreño-Gallardo¹; ¹CIMAV, S.C.

F99: Phase Formation, Transformation and Stability in Micro-Alloyed Sn-Based Lead-Free Solder Alloys and Joints: Guang Zeng¹; Stuart McDonald¹; Jonathan Read¹; Takatoshi Nishimura²; Keith Sweatman²; *Kazuhiro Nogita*¹; ¹The University of Queensland; ²Nihon Superior Co., Ltd.

Phase Transformations and Microstructural Evolution — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Phase Transformations Committee

Program Organizers: Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Soumya Nag, University of North Texas; Rajarshi Banerjee, University of North Texas; Gregory Thompson, University of Alabama ; Amy Clarke, Los Alamos National Laboratory; Frederic Danoix, CNRS - Université de Rouen; Emmanuelle Marquis, University of Michigan

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B162: Effects of Thermomechanical Treatments on Tensile Properties of Fe-Mn-Cr Based Alloys at Elevated Temperatures: *Young-Bum Chun*¹; Seokmin Hong¹; Suk-Hoon Kang¹; Tae-Ho Lee²; Jinsung Jang¹; ¹Korea Atomic Energy Research Institute; ²Korea Institute of Materials Science

B163: Microstructural Evolution of Hydration Products of Reduced Graphene Oxide-Cement Paste Composite Characterized by XRD: *Baig Abdullah Al Muhit*¹; BooHyun Nam¹; Lei Zhai¹; ¹University of Central Florida

B164: In Situ Studies on Radiation Resistant Nanocrystalline and Nanoporous Metals for Advanced Nuclear Energy Applications: *C. Sun*¹; M. Kirk²; S. Maloy¹; X. Zhang³; ¹Los Alamos National Laboratory; ²Argonne National Laboratory; ³Texas A&M University

Polycrystalline Materials: Bringing Together Experiments, Simulations, and Analytic Theories — Poster Session

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Dana Zöllner, Otto von Guericke University Magdeburg; Douglas Medlin, Sandia National Laboratories; Dmitri Molodov, RWTH Aachen

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C62: An Open-Source Toolkit for Computing the CSL and the DSC Lattices for Arbitrary Bravais Lattices: *Srikanth Patala*¹; Arash Banadaki¹; ¹North Carolina State University

C63: Concurrent Atomistic-Continuum Simulation of Dislocation-Interface Reactions in FCC Systems: Liming Xiong¹; Xiang Chen¹; David McDowell²; Youping Chen¹; ¹University of Florida; ²Georgia Institute of Technology

C64: Influence of Grain Boundary Structure on Dislocation Nucleation in Bicrystal Copper Interface under Uniaxial Tension: Eun-Young Kim¹; *Ji-Hwan Shin*¹; Shi-Hoon Choi¹; ¹Sunchon National University C65: Simulations of Forming Limit Diagrams for AA5754 Al Sheet using Fast Fourier Transforms: *Kaan Inal*¹; Ricardo Lebensohn²; Raja Mishra³; ¹University of Waterloo; ²Los Alamos National Laboratory; ³General Motors R&D

C66: Grain Boundary Response to External Tensile Loading in a-Titanium using High-Throughout Computation on the Atomic Scale: *Hao Wang*¹; Gang Zhou¹; Dongsheng Xu¹; Dave Rugg²; Aijun Huang³; Rui Yang¹; ¹Institute of Metal Research, Chinese Academy of Sciences; ²Rolls-Royce plc; ³Baosteel Co. Ltd

C67: Structure and Energies of Σ3 Grain Boundaries: Beyond Twists and Tilts: *Arash Dehghan Banadaki*¹; Srikanth Patala¹; ¹North Carolina State University

C68: Understanding Grain Boundary Embrittlement and Its Correlation with Polycrystalline Tungsten Fracture: Hongsuk Lee¹; *Vikas Tomar*¹; ¹Purdue University

Rare Metal Extraction & Processing 2015 — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee *Program Organizers:* Neale Neelameggham, Ind LLC; Shafiq Alam, University of Saskatchewan; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto Kennecott Utah Copper

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E21: TGA/DTA of Rare Earth Elements: *Katelyn Lyons*¹; Bryce Ruffier¹; Dan Gaede¹; Jerome Downey¹; ¹Montana Tech

E22: Study on Electrolysis for Neodymium Metal Production: *Go-Gi Lee*¹; Sung-Koo Jo¹; Chang-Kyu Lee¹; Hong Youl Ryu²; Jong Hyeon Lee²; ¹RIST; ²Chungnam National University

E23: Experimental Investigation of Recycling Rare Earth Metals from Waste Fluorescent Lamp Phosphors: *Patrick Eduafo*¹; ¹Colorado School of Mines

E24: Recovery of Rare Earth Elements from NdFeB Based Magnet Scraps by Pyrometallurgical Processes: *Yuyang Bian*¹; Shuqiang Guo¹; Kai Tang²; Lan Jiang¹; Changyuan Lu¹; Xionggang Lu¹; Weizhong Ding¹; ¹Shanghai University; ²SINTEF Materials and Chemistry

E25: Research on Quality Improvement of Titanium Sponge By Process Optimization: *Liang Li*¹; ¹Panzhihua Iron&Steel Research Institute

Recent Developments in Biological, Structural and Functional Thin Films and Coatings — Poster Session

Sponsored by: TMS Functional Materials Division (formerly EMPMD), TMS: Thin Films and Interfaces Committee *Program Organizers:* Adele Carradò, IPCMS; Heinz Palkowski, Clausthal Univ of Technology; Roger Narayan, University of North

Caroloina; Nuggehalli Ravindra, New Jersey Institute of Technology; Nancy Michael, University of Texas at Arlington

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

F100: Effect of K+-Na+ Ion Exchange on Soda-Lime Glasses: *Ipek Erdem*¹; Duygu Güldiren¹; Süheyla Aydin¹; ¹Istanbul Technical University

F101: Boron-Based Carbon Enriched Nano Fiber Towards Biodegradable FGM Via DIMOX, Rheocasting and Thixocasting: *Bakr Rabeeh*¹; ¹German University in Cairo, GUC

POSTERS

F102: The Microstructure Investigations and Corrosion Behaviour of Laser Welded TP347 and P91 Steels: *Slawomir Kac*¹; ¹AGH-University of Science and Technology

F103: Microwave-Assisted Growth of Copper Germanide Thin Films at Unusually Low Temperatures: Sayantan Das¹; *A. Lanz*²; Zhao Zhao¹; Terry Alford¹; ¹Arizona State University; ²Norfolk State University

F104: Substrate -- Enamel Interface Relation and Impact on Quality of Enamel: *Ozge Isiksacan*¹; Onuralp Yucel¹; Alper Yesilcubuk¹; ¹Istanbul Technical University

F105: Preparation of BaCo0.7Fe0.2Nb0.1O3-d Asymmetric Tubular Oxygen Permeable Membrane by Dip-Coating and Co-Sintering Process: *Yinhe Liu*¹; Weizhong Ding¹; Lan Jiang¹; Gonghui Yang¹; Xingxing Zhang¹; Rong Jin¹; He Wang¹; ¹Shanghai Key Laboratory of Modern Metallurgy and Materials Processing, Shanghai University

F106: The Influence of Mn on the Interfacial Reaction For Hot-dipping 55Al-Zn-1.6Si/Iron: *Xuan Dai*¹; Guangxin Wu¹; Wangjun Peng¹; Xin Yang¹; Jieyu Zhang¹; ¹Shanghai University

F107: Two-Way Shape Memory Effect of Ni-Ti Bi-Layer Thin Film: Maryam Mohri¹; Mahmoud Nili-Ahmadabadi¹; Horst Hahn²; ¹University of Tehran; ²Karlsruhe Institute Technology

F108: Bonding Chitosan to Steel as a Method to Reduce Corrosion: *Stephen Cornich*¹; Holly Martin¹; ¹Youngstown State University

F109: Experimental Studies on Investigating Silver Containing Soda-Lime Glasses Prepared by Ion Exchange Process: Duygu Güldiren¹; Ipek Erdem¹; Süheyla Aydin¹; ¹Istanbul Technical University

Recycling and Sustainability Update — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Randolph Kirchain, Massachusetts Institute of Technology; Jeffrey S. Spangenberger, Argonne National Laboratory

Monday PM	Room: Atlantic Hall
March 16, 2015	Location: Dolphin

Session Chair: Jeffrey Spangenberger, Argonne National Laboratory

J23: Characteristic Study of Rubber Powder on Pre-Process Waste Ground Rubber Tire for Recycling: *Jongmoon Park*¹; Ju-Young An²; Deasuk Bang³; Bong-Seok Kim⁴; Myung-Hoon Oh²; ¹Kumoh National Institute of Technology; ²Advanced Materials Engineering, Kumoh National Institute of Technology; ³Energy and Integrated Materials Engineering, Kumoh National Institute of Technology; ⁴Tinker Route Co., Ltd.

J24: Evaluation of the Silver Recovery from Radiographic Films in a Filter Press Electrochemical Reactor: *Pedro Ramirez Ortega*¹; Victor Reyes Cruz²; Luis García Lechuga¹; Diana Arenas Islas¹; Mizrraim Flores Guerrero¹; Laura García Hernández¹; ¹Universidad Tecnológica de Tulancingo; ²Universidad Autónoma del Estado de Hidalgo

J25: Extraction of Pure Silicon from Aluminum Die Casting Scrap by a Combined Process of Solvent Refining and Centrifugal Separation: *Je-Beom Jeon*¹; Ji-Won Yoon¹; Kum-Hee Seo¹; Ki-Young Kim¹; ¹Korea University of Technology and Education

J26: Indium Recovery from Discarded LCD Screens: Study of the Influency of Acid Concentration, Temperature and Time in the Leaching Process: *Hugo Hashimoto*¹; Laura Hanada¹; Denise Espinosa¹; Viviane Tavares¹; ¹Escola Politécnica da Universidade de São Paulo

J27: Recycling Wastes in the Alumina and the Cement Industry: *Ilyoukha Nickolai*¹; Valentina Timofeeva¹; ¹Academic Ceramic Center

J28: Leaching of Gold from Printed Circuit Boards Scrap of Mobile Phones: Angela Kasper¹; Hugo Veit¹; ¹UFRGS J29: Experimental Study on Reduction in Low Grade Lateritic Nickel Ore Mixed with Pickling Sludge: Yahui Feng¹; ¹Shanghai University

SMD 2015 Technical Division Student Poster Contest — Graduate

Sponsored by: TMS Structural Materials Division

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

SPG-25: A Study of Reverse Peritectoid Phase Transformation in Co3W Alloy: Shan Zhu¹; Alex Aning²; *Ibrahim Khalfallah*²; ¹Tianjin University; ²Virginia Tech

SPG-26: An Automatic Microstructure Recognition System: *Brian DeCost*¹; Elizabeth Holm¹; ¹Carnegie Mellon University

SPG-27: Analysis of Mechanical Properties of Concrete Containing Fly Ash and Nanosilica: *Hildelix Soto*¹; O. Marcelo Suarez¹; Nitza Garcia¹; Carlos Medina¹; Elizabeth de la Cruz¹; ¹University of Puerto Rico at Mayaguez

SPG-28: Investigating Small Fatigue Crack Growth Behavior in Ti-6242S Using Ultrasonic Fatigue and Scanning Electron Microscopy: Jason Geathers¹; J. Wayne Jones¹; Samantha Daly¹; ¹University of Michigan

SPG-29: Mechanical Properties of Thick Coatings Prepared by Advanced Methods of Deposition: *Igor Moravcik*¹; Jakub Pinos²; Jan Cizek¹; Ivo Dlouhý¹; ¹Brno University of Technology; ²Institute of Scientific Instruments of the ASCR

SPG-30: Peritectoid Phase Transformations in Ni3Mo Alloy: *Ibrahim Khalfallah*¹; Alex Aning¹; ¹Virginia Tech

SMD 2015 Technical Division Student Poster Contest — Undergraduate

Sponsored by: TMS Structural Materials Division

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

SPU-14: Effects of Heat Treatment on the Microstructural Evolution of a NiTiHfAl Shape Memory Alloy: *Brandon Saraydar*¹; Michael Kesler¹; Amanda Varela¹; John Newman²; Terryl Wallace²; Michele Manuel¹; ¹University of Florida; ²National Aeronautics and Space Administration

SPU-15: Ex Situ and In Situ Small Scale Mechanical Testing of 304 Stainless Steel and MA957: *Hi Vo*¹; Manuel Abad¹; David Frazer¹; Ashley Reichardt¹; Nathan Bailey¹; Peter Hosemann¹; ¹University of California Berkeley

SPU-16: Fabrication and Characterization of Chitin-bamboo Composites: *Manny de Jesus*¹; Sujeily Soto¹; O. Marcelo Suarez¹; ¹University of Puerto Rico

SPU-17: Healing Optimization in a Self-Healing Composite Metallic Matrix: *Alexander Wilson-Heid*¹; Hunter Henderson¹; M. Wright²; Michele Manuel¹; ¹University of Florida; ²NASA Kennedy Space Center

SPU-18: Microstructure, Phase Evolution and Properties of High Entropy Brasses and Bronzes: *Aarthi Sridhar*¹; Cody Crosby¹; Kevin Laws²; Patrick Conway²; Leah Koloadin²; Mo Zhao¹; Shifrah Aron-Dine¹; Lori Bassman¹; ¹Harvey Mudd College; ²University of New South Wales

SPU-19: Molecular Dynamics Simulation of Force-Controlled Nanoindentation: *Keaton Jaramillo*¹; Douglas Spearot¹; ¹University of Arkansas

SMD 2015 Technical Division Young Professional Poster Contest

Sponsored by: TMS Structural Materials Division, TMS: Young Professionals Committee

Monday PM March 16, 2015 Room: Atlantic Hall Location: Dolphin

YP-12: DADI – A New Structural Material: Influence of Austempering on Its High Temperature Properties: *Olga Tsurtsumia*¹; Elguja Kutelia¹; Nugzar Khidasheli¹; ¹Georgian Technical University

YP-13: Modeling of Shear Transformation Induced Deformation Behavior in Crystalline Materials: *M. Arul Kumar*¹; ¹Los Alamos National Lab

YP-14: Revisiting Dislocation Annihilation on the Atomic Scale: *Hao Wang*¹; ¹Institute of Metal Research, Chinese Academy of Sciences

YP-15: Shedding Some Light on the Early Grain Growth Regime: *Dana Zöllner*¹; Peter Streitenberger¹; Paulo Rios²; ¹Otto von Guericke University Magdeburg; ²Universidade Federal Fluminense

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) — Poster Session

Sponsored by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

Program Organizers: Brajendra Mishra, Colorado School of Mines; Iver Anderson, Ames Laboratory; Brian Bliss, Association for Iron and Steel Technology (AIST); Jeffrey Fergus, Auburn University; Ali Memari, Penn State University; Jonathan Motherwell, Jonathan T. Motherwell and Associates, LLC; Carol Russell, Environmental Protection Agency; Emily Sarver, Virginia Tech; Darlene Schuster, AICHE's Institute for Sustainability; Deborah Shields, Colorado State University

Wednesday PM March 18, 2015

Room: Asbury Lobby Location: Yacht & Beach

Funding support provided by: American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)

ESS-1: Development of an Electromechanical Prototype for Electricity Generation by the Vibrational Energy Obtained Through Piezoelectric Material: Catia Viana¹; *Cicero Lobo*¹; ¹Fluminense Federal Institute

ESS-2: Effect of La2O3 on Cu-ZnO-ZrO2 Catalysts for Methnaol Synthesis from CO2 Hydrogenation: Wengui Gao¹; Hua Wang¹; Zhiqiang Qin¹; Wei Na¹; ¹Kunming University of Science and Technology

ESS-3: Influence of the Content of Dimension Stones Solid Waste in the Physical and Mechanical Behavior of Structural Ceramic: Alessandra Savazzini Reis¹; Danilo Fermino²; Viviana Della Sagrillo³; *Francisco Valenzuela Diaz*²; ¹USP/IFES; ²USP; ³IFES

ESS-4: The Reuse Technology on the Tri-Methyl Gallium for LED: *Jae Sik Yoon*¹; ¹Korea Basic Science Institute

ESS-5: Preparation of Nano Crystalline Forsterite Synthesized by Mechanical

Activation to Use Orthopedic and Dental Applications: *Hassan Gheisari Dehsheikh*¹; Ebrahim Karamian¹; Farkhonde Zilabi¹; Artina Gheisari Dehsheikh¹; ¹Najafabad University

ESS-6: Development on Cu Smelters in China Today: *Yan Jie*¹; ¹China ENFI Engineering Corporation

ESS-7: Multi-Objective Optimization of Membrane Materials Selection for Direct Methanol Fuel Cell System Design: *Jimoh Adewole*¹; Abdullah Sultan¹; Amir Al-Ahmed¹; S. M. Javid Zaidi²; ¹King Fahd University of Petroleum & Minerals; ²The University of Queensland, Australia ESS-8: SrFe12O19 Powders Synthesis from Oily Cold Rolling Mill Sludge by Hydrothermal Process: *Bo Liu*¹; Shengen Zhang¹; ¹University of Science and Technology Beijing

ESS-9: Synthesis and Characterization of Micaceous Iron Oxide Pigment from Oily Cold Rolling Mill Sludge: *Shengen Zhang*¹; Bo Liu¹; ¹University of Science & Technology Beijing

ESS-10: Twins Evolution during the Recrystallization Induced by Electric Current: *Xiang Zhao*¹; Xinli Wang¹; Wenbin Dai¹; Meishuai Liu¹; Nan Wu¹; ¹Northeastern University

ESS-11: Experimental Study on Reduction in Low Grade Lateritic Nickel Ore Mixed with Pickling Sludge: *Yahui Feng*¹; ¹Shanghai University

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