



TMS2014

143rd Annual Meeting & Exhibition

*February 16-20, 2014 • San Diego Convention Center
San Diego, California, USA*



*Linking Science and Technology
for Global Solutions*



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DEAR FRIENDS AND COLLEAGUES,

With great pleasure, I welcome you to the 143rd TMS Annual Meeting & Exhibition, a premier event in the minerals, metals, and materials community.

TMS2014 is filled with so many great options; it can be difficult to determine how best to spend your time. Might I suggest that you plan for at least a little of each of the following activities – learn, meet, get involved, and have fun.

LEARN

Technical Sessions: Over 3,000 technical presentations and dozens of symposia are listed in this book, and you can put together a personalized electronic schedule when you download the TMS2014 mobile application for your smartphone. (See page 3 for more information on the app.)

Spotlight Sessions: Several plenary and keynote sessions explore exciting topics. All sessions occur in the San Diego Convention Center – Room 6A. (See page 20 for descriptions.)

Continuing Education: Workshops and Short Courses are available on Sunday, February 16, to all who register for them. (See page 33 for information.)

MEET

Networking Events: The best part of on-site meetings is the “meet” part. No matter what career stage you are in, at TMS2014 you can reunite with or make new friends and colleagues. (See page 32.)

Exhibition Hall: Exhibitors from around the globe help you make the most of your time here, too, and connect you with industry. Special lunches and receptions take place in the exhibit hall throughout the week. (See the Exhibitor’s List beginning on page 42.)

GET INVOLVED

Committee Meetings: Attend a technical committee meeting in your area of interest. (See the Schedule of Events beginning on page 5 for a listing of times and locations.)

Meeting of the Membership: Find out what TMS is planning in 2014 and beyond. (See page 32.)

TMS Foundation: Give generously to secure the future of our professions. (Booth #118 or page 15 in this book.)

HAVE FUN

COMIC-tanium: This museum-quality exhibit is on display as a fun way to promote the material sciences. Children of attendees are also invited during special hours. (See page 13 for more information.)

Awards & Entertainment: The Annual Awards Ceremony is open to all attendees. For those with dinner tickets, Scottish fiddle legend Alasdair Fraser and cellist Natalie Haas provide live entertainment. (See page 34.)

Learn, meet, get involved, and have fun at TMS2014 in beautiful San Diego!

Sincerely,

Elizabeth Holm



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MEETING HIGHLIGHTS

- **COMIC-tanium:** The Super Materials of the Superheroes (page 13)
- **Quantum Design Manufacturing Facility Tour** (page 26)
- **TMS-AIME Awards Banquet** with live entertainment (page 34)
- **Student Poster Contest** (page 33)
- **Meeting of the Membership** (page 32)
- **Speed Networking Luncheon** (page 32)
- **Young Professionals Luncheon** (page 30)
- **Women in Science Breakfast** (page 32)
- **TMS Foundation Prize Drawings** (page 15)
- **Azorian: The Raising of K-129** Documentary Film Screening (page 12)



Time to Tweet. Follow the **@TMSociety** Twitter account or post using **#TMS14**. Stay current on all of the meetings' updates via the live Twitter feed accessible on the TMS Mobile Application, the large screens around TMS2014, on the TMS2014 website, and on Twitter.

TMS Charging Stations sponsored by **Hatch and Harbison Walker Refractories Co.** are available in the main aisle of the Exhibit Hall for powering up iPhones, Nextel and Sprint mobile phones.





REGISTRATION

Your full-meeting registration badge provides you access to:

- Technical and Poster Sessions
- Three-Day Pass to the TMS2014 Exhibition
- President's Welcoming Reception and Happy Hour Reception (located in the Exhibit Hall)
- Admission to the Awards Ceremony of the TMS-AIME 2014 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 (authors, exhibitors, etc.) must register for the meeting. Badges must be worn for admission to technical sessions, the exhibition hall, social functions, and other events.

TMS2014 MEETING NEWS OPTIONS

Now you have three options for receiving the most up-to-date, real-time news for TMS2014.

1. The TMS2014 mobile application serves as your hand-held guide to the meeting. Download this free tool from the Apple iTunes Store for your iPhone or iPad or through Google Play for Android devices by searching for "TMS Annual Meeting." Features include:
 - Latest programming schedule
 - View complete abstracts
 - Build your personal schedule and download to your device
 - Speaker information
 - Exhibit map
 - Exhibitors and sponsors
 - Venue information
 - Monitor the *@TMSociety* real-time Twitter feed and the TMS Facebook page*.
2. The *@TMSociety* Twitter handle and #TMS14 let you see meeting news in real-time and let you join the conversation. Follow *@TMSociety* and post to #TMS14 to discuss the meeting and engage with colleagues near and far.
3. The TMS2014 website provides the option for accessing the latest news about the meeting from any internet-connected device or computer. You can monitor the news feed as well.
Please visit www.tms.org/TMS2014

**The TMS Mobile App lets you monitor the Twitter feed and Facebook page without logging into your social media account; however, to comment or post, you will need to log into your social media account and address #TMS14.*

INTERNET ACCESS

Free wireless internet is available at the San Diego Convention Center in the public areas outside of Halls A to G on the ground level. Please select the "Free Internet" network for access.

Complimentary wireless internet access is also available in the Connect Zone located in the Sails Pavilion on the Upper Level. 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. to 4:00 p.m. daily. Please select the "TMS2014" network for access.



FOOD AND BEVERAGES

There is a Starbucks Coffee located outside of Hall A in the San Diego Convention Center open daily to visitors and meeting attendees. There is also a Starbucks Coffee located in the South Tower of the Marriott Marquis and Marina Hotel. Additional dining options are available at the Marriott including the Marina Kitchen Café (open in the mornings only) and the Marina Kitchen Restaurant.

There are many dining options within easy walking distance of the San Diego Convention Center and the TMS hotels. For suggestions and information on dining visit the Convention Center Restaurant & Concierge Booth located in lobby B2 of the Convention Center. You can also visit www.visitsandiego.com.

BUSINESS CENTERS

There is a full-service FedEx Kinkos in the San Diego Convention Center on the ground level outside of Halls C & D. FedEx is open on Sunday from 9:00 a.m. to 5:00 p.m. and Monday through Friday from 8:00 a.m. to 5:00 p.m. For more information on available services, please visit local.fedex.com/ca/san-diego/office-1324/.

There is a full-service UPS Store in the San Diego Marriott Marquis and Marina in the south tower. The UPS Store is open on Sunday from 7:00 a.m. to 5:00 p.m. and Monday through Friday from 7:00 a.m. to 7:00 p.m. For more information on available services, please visit theupsstore.com and specify store number 6200.

NOTE ABOUT TIME

All times in this program refer to Pacific Standard 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."



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. "Guest" badges are for spouses or companions of registered attendees and are used as identification only. "Guest" and "Exhibit Only" attendees may not attend technical sessions.

REFUND POLICY

The deadline for all refunds was January 17, 2014. No refunds will be issued at the meeting. Fees and tickets are nonrefundable.

PHOTOGRAPHY AND AUDIO/ VIDEO 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 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. Attendees violating this policy may be asked to leave the session.

AMERICANS WITH DISABILITIES ACT



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 (Booth #118).

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.

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MEETING LOGISTICS



TMS INFORMATION CENTER (NEW!)

The TMS Information Center is located at Booth #118 in the Exhibit Hall. The center consolidates all things TMS in a convenient location. Stop by for information about:

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

TMS FOUNDATION BOOTH

The TMS Foundation Booth is located near the Technical Programming Support Desk. Here you can learn more about The TMS Foundation initiatives. Full-conference attendees can also drop off the ticket included with their registration badge for a chance to win a prize. Tickets may also be dropped off at the TMS Information Center or TMS2014 Help Desk.

TMS2014 HELP DESK

The TMS2014 Help Desk is located near Registration and it is the place to go for any questions about the meeting, as well as for all questions about online access to the Collected Proceedings and the @TMSociety / #TMS14 Twitter feed. You can also learn more about and the TMS Foundation here.

LOCATION DETAILS (SAN DIEGO & CONVENTION CENTER)

The Convention Center Restaurant & Concierge Booth, located in lobby B2, will be open from Sunday,

February 16 to Thursday, February 20 from 9:00 a.m. to 5:30 p.m. The knowledgeable booth staff can assist in making restaurant reservations, securing attraction and tour tickets, providing city information, and finding transportation, as well as providing information on local shopping and restaurant discounts and coupons.

For more information about San Diego visit www.visitsandiego.com or follow on Twitter @visitsandiego.

WEBSITE USER TESTING INVITATION

Help TMS Make a Better Website

We're rebuilding the TMS Website and we need your help. Provide us with your input in a 20-minute session and you can help us make sure the new TMS.org meets your needs and those of your colleagues. Please stop by the TMS Information Center (**Booth #118**) to learn more and to sign up for a session during one of the following time slots:

Monday, February 17 • 1:00 p.m. to 2:00 p.m.

Tuesday, February 18 • 11:00 a.m. to noon

Wednesday, February 19 • 10:00 a.m. to 11:00 a.m.

The user session takes place at the TMS Information Learning Center, only takes 20 minutes, and you will receive a token of our appreciation for your time! Limited sessions available.

SCHEDULE OF EVENTS - SATURDAY



Function	Time	Venue	Room	Access*
Saturday, February 15				
TMS2014 Exhibition				
Exhibit Move-In	8:00 a.m. to 5:00 p.m.	SDCC	Exhibit Hall B1	R
Committee Meetings				
Professional Registration Writers Workshop and Committee Meeting	9:00 a.m. to 5:00 p.m.	MM	Cardiff	R
Financial Planning Committee	2:00 p.m. to 5:00 p.m.	MM	Mission Hills	R
Professional Registration Committee Dinner	6:00 p.m. to 8:00 p.m.	MM	Balboa	R
TMS Board of Directors Dinner	6:00 p.m. to 10:00 p.m.	Offsite		I

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 ■ MM - Marriott Marquis Hotel & Marina
 BR - Ballroom

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 (T2 - Tickets may be purchased onsite up to 24 hours before event)



SCHEDULE OF EVENTS - SUNDAY

MEETING INFORMATION

Function	Time	Venue	Room	Access*
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Sunday, February 16

All-Conference Events

Registration	7:00 a.m. to 6:00 p.m.	SDCC	Exhibit Hall A	O
TMS Help Desk	7:00 a.m. to 6:00 p.m.	SDCC	Exhibit Hall A	O
Technical Programming Support Desk	noon to 6:00 p.m.	SDCC	BR 6 Lobby	O
Young Professional "Meet the Candidate" Poster Session Set Up	noon to 6:00 p.m.	SDCC	Room 12	
General, Symposium, Student, and Young Professional Poster Session Set-up	2:00 p.m. to 6:00 p.m.	SDCC	Sails Pavilion	O
Young Professional "Meet the Candidate" Poster Session	6:30 p.m. to 7:30 p.m.	SDCC	Room 12	O
TMS Meeting of the Membership	7:00 p.m. to 8:00 p.m.	SDCC	Room 16AB	O

TMS2014 Exhibition

Exhibit Move-In	8:00 a.m. to 5:00 p.m.	SDCC	Exhibit Hall B1	R
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Continuing Education and Special Presentations

Short Course Registration Desk	7:00 a.m. to 10:30 a.m.	MM	Marina BR Desk	O
CANCELLED: Short Course: Proper Anode Baking Furnace Operation- How and Why	8:30 a.m. to 4:30 p.m.	MM	Carlsbad	T
Short Course: Pot Ventilation & Dry Scrubbing Operations for Aluminum Smelters	8:30 a.m. to 4:30 p.m.	MM	Balboa	T
Short Course: Fundamentals of Friction Stir Welding	8:30 a.m. to 4:30 p.m.	MM	Palomar	T
Workshop: Furnace Systems Technology	8:30 a.m. to 4:30 p.m.	MM	Mission Hills	T
Short Course: Grain Refinement of Aluminum and Magnesium Alloys: Theory and Practice	8:30 a.m. to 4:30 p.m.	MM	Laguna	T
CANCELLED: Short Course: Incorporating Life Cycle Assessment in Operational Decision-Making	8:30 a.m. to 4:30 p.m.	MM	Leucadia	T
Tutorial: Neutron and X-rays- Sources, Instrumentation, and Scattering	8:30 a.m. to 4:30 p.m.	MM	Oceanside	T
Workshop: 11th Annual Lead-Free Solders and Interconnect Workshop	8:30 a.m. to 4:30 p.m.	MM	Miramar	T
CANCELLED: Short Course: Radiation Effects on Oxide Ceramics and Novel NWR Fuels	8:30 a.m. to 4:30 p.m.	MM	Vista	T
CANCELLED: Short Course: Sustainability and Minerals Resources	8:30 a.m. to 4:30 p.m.	MM	Malibu	T
Short Course: Theory of Constraints: Tools and Tactics for Creating Business Value in Aluminum Smelters and Other Process Industries	8:30 a.m. to 4:30 p.m.	MM	Newport Beach	T

Student Events

Materials Bowl	noon to 8:30 p.m.	SDCC	Room 14AB	O
Elimination Rounds	noon to 3:00 p.m.			
Championship Round	8:00 p.m. to 4:00 p.m.			

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SCHEDULE OF EVENTS - SUNDAY



Student Technical Division Poster Session Set-Up	2:00 p.m. to 6:00 p.m.	SDCC	Sails Pavilion	O
Student Networking Mixer	8:30 p.m. to 10:30 p.m.	SDCC	Room 15AB	T2

Social Functions

Fellows and Invited Guests Reception	4:30 p.m. to 6:30 p.m.	MM	Marina Kitchen Terrace	I
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Committee Meetings

TMS Board of Directors New Member Orientation	8:30 a.m. to 11:00 a.m.	MM	Point Loma	I
Professional Registration Leadership	8:00 a.m. to 10:00 a.m.	MM	Conference Suite 1	R
TMS Board of Directors Meeting	11:10 a.m. to 1:30 p.m.	MM	Point Loma	I
Recycling & Environmental Technologies Committee	noon to 1:30 p.m.	MM	Del Mar	O
Accreditation Committee	12:30 p.m. to 2:30 p.m.	MM	Coronado	O
Audit Committee	1:00 p.m. to 1:30 p.m.	MM	Conference Suite 2	R
Magnesium Committee	1:30 p.m. to 3:00 p.m.	MM	Del Mar	O
TMS Nominating Committee Meeting	2:00 p.m. to 3:00 p.m.	MM	Conference Suite 1	I
Aluminum Committee	2:00 p.m. to 4:00 p.m.	MM	Cardiff	O
Materials Characterization Committee	2:30 p.m. to 4:00 p.m.	MM	Marina BR D	O
ABET Refresher Training	3:00 p.m. to 5:00 p.m.	MM	Temecula 1	O
Public & Governmental Affairs Committee	3:30 p.m. to 5:00 p.m.	MM	Catalina	O
Thin Films & Interfaces Committee	4:00 p.m. to 5:00 p.m.	MM	Marina BR E	O
Hydrometallurgy & Electrometallurgy Committee	4:00 p.m. to 5:00 p.m.	MM	Marina BR F	O
Nanomaterials Committee	4:00 p.m. to 5:00 p.m.	MM	La Costa	O
PRICM9 International Organizing Committee	4:00 p.m. to 6:00 p.m.	SDCC	Room 18	I
TMS Program Committee Meeting	4:00 p.m. to 6:00 p.m.	MM	Point Loma	R
LMD Council	4:30 p.m. to 6:00 p.m.	MM	Solana	I
Content Development and Dissemination Committee	5:00 p.m. to 7:00 p.m.	MM	Cardiff	I
Materials Innovation Committee	5:30 p.m. to 7:00 p.m.	MM	Del Mar	O
Nanomechanical Materials Behavior Committee	5:45 p.m. to 6:45 p.m.	MM	Newport Beach	O
Pyrometallurgy Committee	6:00 p.m. to 7:30 p.m.	MM	Leucadia	O
Mechanical Behavior of Materials Committee	7:00 p.m. to 8:30 p.m.	MM	Miramar	O
Alloy Phases Committee	7:30 p.m. to 9:30 p.m.	MM	Laguna	O
Phase Transformation Committee	7:30 p.m. to 9:30 p.m.	MM	Del Mar	O

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 (T2 - Tickets may be purchased onsite up to 24 hours before event)

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.



SCHEDULE OF EVENTS - MONDAY

MEETING INFORMATION

Function	Time	Venue	Room	Access*
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Monday, February 17

All-Conference Events

Registration	7:00 a.m. to 6:00 p.m.	SDCC	Exhibit Hall A	O
TMS Help Desk	7:00 a.m. to 6:00 p.m.	SDCC	Exhibit Hall A	O
Technical Programming Support Desk	7:00 a.m. to 6:00 p.m.	SDCC	BR 6 Lobby	O
Presenters' Coffee	7:00 a.m. to 8:00 a.m.	SDCC	Sails Pavilion	R
General and Symposium Poster Session Set-up	8:00 a.m. to 6:00 p.m.	SDCC	Sails Pavilion	O
TMS Foundation Booth	8:00 a.m. to 6:00 p.m.	SDCC	BR 6 Lobby	O
Technical Programming	8:30 a.m. to 5:30 p.m.	See Technical Program for complete schedule and locations		O
Morning Break	9:50 a.m. to 10:30 a.m.	SDCC & MM		O
TMS Information Center	noon to 6:30 p.m.	SDCC	Exhibit Hall B1	O
Afternoon Break	3:30 p.m. to 4:10 p.m.	SDCC & MM		
President's Welcoming Reception	5:00 p.m. to 6:30 p.m.	SDCC	Exhibit Hall B1	O
Poster Session Presentations and Reception	6:30 p.m. to 8:30 p.m.	SDCC	Sails Pavilion	O

TMS2014 Exhibition

TMS2014 Exhibition Hours	noon to 6:30 p.m.	SDCC	Exhibit Hall B1	O
COMIC-tanium! The Super Materials of the Superheroes (brought to you by the TMS Foundation)	noon to 6:30 p.m.	SDCC	Exhibit Hall B1	O
Lunch Concession Stand	noon to 2:00 p.m.	SDCC	Exhibit Hall B1	O

Special Presentations

Innovation in the Aluminum Industry Supply Chain – How Will We Move on to the Next S Curve?	8:30 a.m. to noon	SDCC	Room 6A	O
Materials and Society Keynote Lecture	2:00 p.m. to 5:30 p.m.	SDCC	Room 6A	O
Congressional Fellow Talk	3:30 p.m. to 4:30 p.m.	SDCC	Exhibit Hall B1	O

Student Events

Technical Division Student Poster Contest Presentation & Judging	3:30 p.m. to 5:30 p.m.	SDCC	Sails Pavilion	O
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Social Functions

Women in Science Breakfast	7:00 a.m. to 8:00 a.m.	MM	San Diego BR A	T2
Speed Networking Event	11:30 a.m. to 1:30 p.m.	MM	San Diego BR A	T

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Stay the whole week!

The last day of the meeting is just as packed with sessions as the early days. So, take advantage of 45 concurrent sessions on **Thursday, February 20.**

SCHEDULE OF EVENTS - MONDAY



IOMMMS Reception	4:30 p.m. to 5:30 p.m.	MM	Vista	I
Young Professionals Reception	6:00 p.m. to 7:00 p.m.	MM	Coronado	O
Robertson Symposium Honorary Dinner- Hornblower Cruise	5:45 p.m. to 9:00 p.m.	Offsite	Marriott Marina	
President's Invitational Dinner	6:00 p.m. to 9:00 p.m.	Offsite		I

Committee Meetings

Metallurgical and Materials Transactions A Board of Review	7:00 a.m. to 8:00 a.m.	MM	La Costa	I
Process Technology & Modeling Committee	7:00 a.m. to 8:00 a.m.	MM	Newport Beach	O
Membership & Student Development Committee Meeting	8:45 a.m. to 10:00 a.m.	MM	Leucadia	R
Women In Materials Science & Engineering Committee	9:30 a.m. to 10:30 a.m.	MM	Coronado	O
TMS Executive Committee Meeting	10:00 a.m. to 11:00 a.m.	MM	Encinitas	I
TMS Past Presidents Meeting	11:30 a.m. to 1:00 p.m.	MM	Leucadia	I
EPD Council	noon to 2:00 p.m.	MM	Point Loma	I
ICME Committee	12:15 p.m. to 1:45 p.m.	MM	Solana	O
Powder Materials Committee	12:30 p.m. to 2:00 p.m.	MM	Balboa	O
EMPMD Council	12:30 p.m. to 2:00 p.m.	MM	La Costa	I
Energy Conversion & Storage Committee	5:00 p.m. to 6:00 p.m.	MM	Newport Beach	O
Biomaterials Committee	5:30 p.m. to 6:30 p.m.	MM	Mission Hills	O
Chemistry & Physics of Materials Committee	5:30 p.m. to 6:30 p.m.	MM	Cardiff	O
Nuclear Materials Committee	5:30 p.m. to 7:00 p.m.	MM	Carlsbad	O
Materials & Society Committee	5:30 p.m. to 7:30 p.m.	MM	Del Mar	I
Advanced Characterization, Testing & Simulation Committee	5:45 p.m. to 6:45 p.m.	MM	Balboa	O
Composite Materials Committee	5:45 p.m. to 6:45 p.m.	MM	Marina BR D	O
Magnetic Materials Committee	6:00 p.m. to 7:00 p.m.	MM	Leucadia	O
Solidification Committee	6:00 p.m. to 7:00 p.m.	MM	Point Loma	O
Surface Engineering Committee	6:00 p.m. to 7:00 p.m.	MM	La Costa	O

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New for TMS2014: Interactive session signs!

Print session signs are a thing of the past at TMS2014!

Use one of several monitors in the technical session areas to access program information, such as speakers, topics, and room locations.

In addition to being leaner and greener, these interactive session signs will be updated in real-time in the event of speaker cancellations or delays.

Find the sessions that are most important to you three ways:

- Traditional Printed Program
- Mobile App
- Personal Conference Scheduler
- And now... Interactive Session Signs!



SCHEDULE OF EVENTS - TUESDAY

MEETING INFORMATION

Function	Time	Venue	Room	Access*
Tuesday, February 18				
All-Conference Events				
Registration	7:00 a.m. to 5:30 p.m.	SDCC	Exhibit Hall A	O
TMS Help Desk	7:00 a.m. to 5:30 p.m.	SDCC	Exhibit Hall A	O
Technical Programming Support Desk	7:00 a.m. to 6:00 p.m.	SDCC	BR 6 Lobby	O
Presenters' Coffee	7:00 a.m. to 8:00 a.m.	SDCC	Sails Pavilion	R
TMS Foundation Booth	8:00 a.m. to 5:30 p.m.	SDCC	BR 6 Lobby	O
Technical Programming	8:30 a.m. to 5:30 p.m.	See Technical Program for complete schedule and locations		O
Poster Gallery	8:30 a.m. to 5:30 p.m.	SDCC	Sails Pavilion	O
Morning Break	9:50 a.m. to 10:30 a.m.	SDCC & MM		O
TMS Information Center	10:00 a.m. to 5:30 p.m.	SDCC	Exhibit Hall B1	O
Afternoon Break	3:30 p.m. to 4:10 p.m.	SDCC & MM		

■ SDCC - San Diego Convention Center
■ MM - Marriott Marquis Hotel & Marina
 BR - Ballroom

O - Open to all attendees
 R - Restrictions Apply
 I - Invitation Only

T - Ticketed Event, Pre-registration required
 T2 - Ticketed Event
 (T2 - Tickets may be purchased onsite up to 24 hours before event)

SPECIAL ANNOUNCEMENT - MEET THE AUTHORS

Tuesday, February 18, 2014 • 10:00 a.m. to 11:30 a.m.

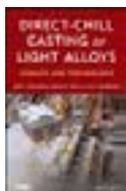
Wiley Booth, San Diego Convention Center, San Diego, California

Join us at the Wiley Booth, located in the registration area of the San Diego Convention Center, on Tuesday morning and meet the authors of four of the latest publications from TMS and Wiley. This informal session will give you the opportunity to discuss these hot topic titles, and have your purchased copy signed by the authors. TMS Members will also be entitled to a 35% discount.

Featured titles:



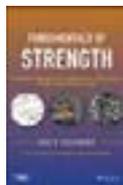
Hydrometallurgy: Fundamentals and Applications, by Michael L. Free
 ISBN 978-1-118-23077-0
 444 pages | November 2013



Direct-Chill Casting of Light Alloys: Science and Technology by John F. Grandfield, Dmitry G. Eskin, and Ian Bainbridge
 ISBN 978-1-118-02265-8
 424 pages | November 2013



Bulk Nanostructured Materials: Fundamentals and Applications, by Ruslan Z. Valiev, Alexander P. Zhilyaev, and Terence G. Langdon
 ISBN 978-1-118-09540-9
 456 pages | December 2013



Fundamentals of Strength: Principles, Experiment, and Applications of an Internal State Variable Constitutive Formulation, by Paul S. Follansbee
 ISBN 978-1-118-41341-8
 518 pages | February 2014

Purchase copies of these and other books published through TMS and Wiley at the Wiley booth, where print proceedings from TMS2014 are also available for purchase. Editor Anita Lekhwani (alekhwan@wiley.com) will be available at the booth to discuss potential book ideas

WILEY | TMS

SCHEDULE OF EVENTS - TUESDAY



TMS2014 Exhibition

TMS 2014 Exhibition Hours	10:00 a.m. to 5:30 p.m.	SDCC	Exhibit Hall B1	O
COMIC-tanium! The Super Materials of the Superheroes (brought to you by the TMS Foundation)	10:00 a.m. to 5:30 p.m.	SDCC	Exhibit Hall B1	O
Lunch Concession Stand	noon to 2:00 p.m.	SDCC	Exhibit Hall B1	O
Happy Hour Reception	4:30 p.m. to 5:30 p.m.	SDCC	Exhibit Hall B1	O

Special Presentations

Manufacturing and Materials Innovation Keynote Session	8:30 a.m. to noon	SDCC	Room 6A	O
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Student Events

Technical Division Student Poster Contest "Best in Show" Judging	10:45 a.m. to 11:45 a.m.	SDCC	Sails Pavilion	O
Student Career Forum	2:30 p.m. to 4:30 p.m.	MM	Catalina	O

Social Functions

EPD/MPMD Luncheon	noon to 1:30 p.m.	MM	San Diego BR A	T2
Young Professional Tutorial Luncheon & Lecture	noon to 2:00 p.m.	MM	Coronado	T2
TMS-AIME Awards Reception	6:00 p.m. to 6:30 p.m.	SDCC	Bayside Lobby	O
TMS-AIME Awards Ceremony	6:30 p.m. to 7:45 p.m.	SDCC	Room 6A	O
TMS-AIME Awards Banquet	7:45 p.m. to 10:00 p.m.	SDCC	West Terrace	T2

Committee Meetings

Metallurgical and Materials Transactions B Board of Review	7:00 a.m. to 8:00 a.m.	MM	La Costa	I
Electronic Packaging & Interconnection Materials Committee	7:00 a.m. to 8:00 a.m.	MM	Leucadia	O
MPMD Council	7:00 a.m. to 9:00 a.m.	MM	Point Loma	I
Honors & Professional Recognition Committee	8:00 a.m. to 9:00 a.m.	MM	Dana Point	R
Young Professional Committee Meeting	8:15 a.m. to 9:45 a.m.	MM	San Diego BR A	O
SMD Council	noon to 2:00 p.m.	MM	Point Loma	I
Education Committee Meeting	12:30 p.m. to 2:00 p.m.	MM	Vista	O
Superalloy 718 & Derivatives Conference Organizing Committee	4:00 p.m. to 5:00 p.m.	MM	La Costa	R
Energy Committee	5:00 p.m. to 6:00 p.m.	MM	Laguna	O
Computational Materials Science & Engineering Committee	5:00 p.m. to 6:00 p.m.	MM	Leucadia	O
Titanium Committee	5:00 p.m. to 6:00 p.m.	MM	Point Loma	O
High Temperature Alloys Committee	5:00 p.m. to 6:30 p.m.	MM	La Costa	O
Shaping & Forming Committee	5:00 p.m. to 7:00 p.m.	MM	Malibu	O
Corrosion & Environmental Effects Committee	5:30 p.m. to 6:30 p.m.	MM	Balboa	O
Refractory Metals Committee	5:30 p.m. to 6:30 p.m.	MM	Carlsbad	O

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SCHEDULE OF EVENTS - WEDNESDAY

MEETING INFORMATION

Function	Time	Venue	Room	Access*
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Wednesday, February 19

All-Conference Events

Registration	7:00 a.m. to 5:00 p.m.	SDCC	Exhibit Hall A	O
TMS Help Desk	7:00 a.m. to 5:00 p.m.	SDCC	Exhibit Hall A	O
Technical Programming Support Desk	7:00 a.m. to 6:00 p.m.	SDCC	BR 6 Lobby	O
Presenters' Coffee	7:00 a.m. to 8:00 a.m.	SDCC	Sails Pavilion	R
TMS Foundation Booth	8:00 a.m. to noon	SDCC	BR 6 Lobby	O
Technical Programming	8:30 a.m. to 5:30 p.m.	See Technical Program for complete schedule and locations		O
Poster Gallery	8:30 a.m. to noon	SDCC	Sails Pavilion	O
TMS Information Center	9:00 a.m. to 1:00 p.m.	SDCC	Exhibit Hall B1	O
Morning Break	9:50 a.m. to 10:30 a.m.	SDCC & MM		O
General, Symposium, Student, and Young Professional Poster Session - Tear Down	noon to 5:00 p.m.	SDCC	Sails Pavilion	R
Afternoon Break	3:30 p.m. to 4:10 p.m.	SDCC & MM		

TMS2014 Exhibition

TMS 2014 Exhibition Hours	9:00 a.m. to 1:00 p.m.	SDCC	Exhibit Hall B1	O
COMIC-tanium! The Super Materials of the Superheroes (brought to you by the TMS Foundation)	9:00 a.m. to 1:00 p.m.	SDCC	Exhibit Hall B1	O

Special Presentations

Project Azorian and Screening of Azorian: The Raising of the K-129	2:00 p.m. to 5:30 p.m.	SDCC	Room 6A	O
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AZORIAN

The Raising of K-129

In 1968 the Soviet ballistic missile submarine K-129 sank in the Central North Pacific. American intelligence located it within weeks of its demise. The CIA crafted a secret program to raise the submarine in 1974. Now, the whole story can be told, by the men who made it happen. This documentary includes never-before-seen footage of the actual salvage attempt and new evidence of the project's successes and failures.

Showing Wednesday, February 19 • 2:00 p.m.
San Diego Convention Center – 6A

SCHEDULE OF EVENTS - WEDNESDAY



Social Functions

LMD Luncheon	noon to 1:30 p.m.	MM	Temecula	T2
SMD Luncheon: The Project AZORIAN Senior Project – Combining History, Politics and Metallurgy	noon to 1:30 p.m.	SDCC	Room 6A	T2

Committee Meetings

TMS Board of Directors Meeting	8:00 a.m. to 11:30 a.m.	MM	Point Loma	I
Graduate Student Advisory Council	9:00 a.m. to 10:00 a.m.	MM	Leucadia	O
Pan American Materials Conference Committee	1:00 p.m. to 2:00 p.m.	MM	Point Loma	R
TMS Foundation Board of Trustees	2:30 p.m. to 4:30 p.m.	MM	Laguna	R
IOC Meeting of Copper 2016	5:00 p.m. to 7:00 p.m.	MM	Encinitas	R

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Download the TMS2014 Mobile Application



COMIC-TANIUM!

THE SUPER MATERIALS OF THE SUPERHEROES

BROUGHT TO YOU BY:
 TMS
 FOUNDATION

The COMIC-tanium exhibit is in Booth #124.

This museum-quality retrospective was developed as a fun, interactive, educational experience—of interest to anyone who has ever read a comic book, watched a superhero movie, or wondered at the possibilities of materials technology. COMIC-tanium is a traveling exhibit that debuts at TMS2014. Later, it will tour the country, bringing real-life minerals, metals, and materials science and engineering to the public in a fun and interesting way. The exhibit is a major outreach initiative of the TMS Foundation and the Toonseum of Pittsburgh.

**Get more information at
www.tms.org/foundation/comictanium.aspx.**



COMIC-tanium for Kids

**Children of attendees
 are invited to visit the
 COMIC-tanium exhibit on
 Wednesday, February 19,
 from 9:00 a.m. to 1:00 p.m.**



SCHEDULE OF EVENTS - THURSDAY

MEETING INFORMATION

Function	Time	Venue	Room	Access*
Thursday, February 20				
All-Conference Events				
Registration	7:00 a.m. to 5:00 p.m.	SDCC	Exhibit Hall A	O
Technical Programming Support Desk	7:00 a.m. to 5:00 p.m.	SDCC	BR 6 Lobby	O
Presenters' Coffee	7:00 a.m. to 8:00 a.m.	SDCC	Sails Pavilion	R
Technical Programming	8:30 a.m. to 5:30 p.m.	See Technical Program for complete schedule and locations		O
Morning Break	9:50 a.m. to 10:30 a.m.	SDCC & MM		O
Afternoon Break	3:30 p.m. to 4:10 p.m.	SDCC & MM		O
Social Functions				
Quantum Design Manufacturing Facility Tour	10:00 a.m. to noon	Offsite	Departs from SDCC	T1

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■ MM - Marriott Marquis Hotel & Marina
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T - Ticketed Event, Pre-registration required
 T2 - Ticketed Event
 (T2 - Tickets may be purchased onsite up to 24 hours before event)

**The right partner.
 The right chemical technologies.
 At just the right time.**

The Right Balance of Performance and Possibilities

As the premier advanced chemicals partner for the Alumina industry, Cytec specializes in producing products with the breadth and depth to advance all stages in the Bayer Process. Our MAX HT[®] scale inhibitor, a revolutionary product that eliminates sodalite scale from heat exchangers, recently received the Environmental Protection Agency's Presidential Green Chemistry award. Our rich and time-tested product portfolio includes:

- CYFLOC[™] HX flocculants giving superior red mud clarification
- AERODRI[®] for improved de-liquoring of calciner feed
- CYBREAK[®] defoamers for foam suppression in Bayer liquors
- CYQUEST[®] crystal growth modifiers (CGM) for enhancing agglomeration hydrate particles
- MAX HT[®] sodalite scale inhibitor

Combined with Cytec's unmatched R&D capabilities and world-class application expertise, we continue Delivering Technology Beyond our Customers' Imagination[™] and encourage and enable the right level of performance. To learn more about how the premier supplier of mining specialty chemicals breaks down the barriers of what is possible today and unlocks new possibilities for tomorrow, visit <http://www.cytec.com/businesses/in-process-separation/mining-chemicals>

CYTEC

JOIN IN THE EXCITEMENT OF THE REVITALIZED

TMS FOUNDATION

TMS Foundation Special Drawing for an iPad Air, Walt Disney World Tickets for TMS2015, and More

Learn about the programs the TMS Foundation funds, make a contribution or pledge, and/or enter a drawing to win an **iPad Air**, a pair of one-day **Walt Disney World passes** for use at the TMS 2015 Annual Meeting and Exhibition, a free **TMS 2015 membership renewal**, or **Walt Disney Lithograph Artwork**. Drop your ticket found in your registration badge in one of our three locations.

The prize drawings will be held Wednesday, February 19, at 12:30 p.m. at the **TMS Information Center (Booth #118)**.

You do not have to be present to win. Also, it is not necessary to donate to enter the raffle, but **a donation or pledge to the TMS Foundation would be very much appreciated** to assist the TMS Foundation as it continues and expands its efforts to nurture students and young professionals. Note that pledges and cash or check donations can be made at the TMS2014 Help Desk, the TMS Information Center, and the TMS Foundation Booth. Credit card donations can only be made at the TMS2014 Help Desk.



About The TMS Foundation

By funding student scholarships, programs for young professionals and education initiatives, the TMS Foundation prepares the future leaders of the global minerals, metals, and materials science and engineering community. When you contribute to the TMS Foundation, you are supporting these future leaders at every step of their education and professional development, ensuring a bright future for the minerals, metals, and materials disciplines.

Foundation-funded programs include:

- Student Scholarships
- Young Professionals Programs
- Awards
- Student Travel Grants
- Special Projects

Visit the TMS Foundation in one of three locations:

- **TMS2014 Help Desk near Registration**
- **TMS Information Center (Booth #118) in the Exhibit Hall**
- **TMS Foundation Booth near the technical programming sessions area.**

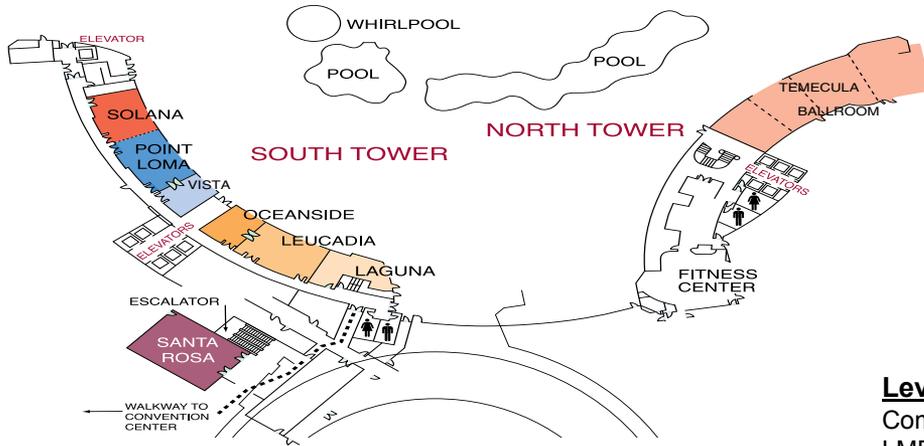


MAP & FLOORPLAN OF MARRIOTT MARQUIS MARINA



Marriott
MARQUIS
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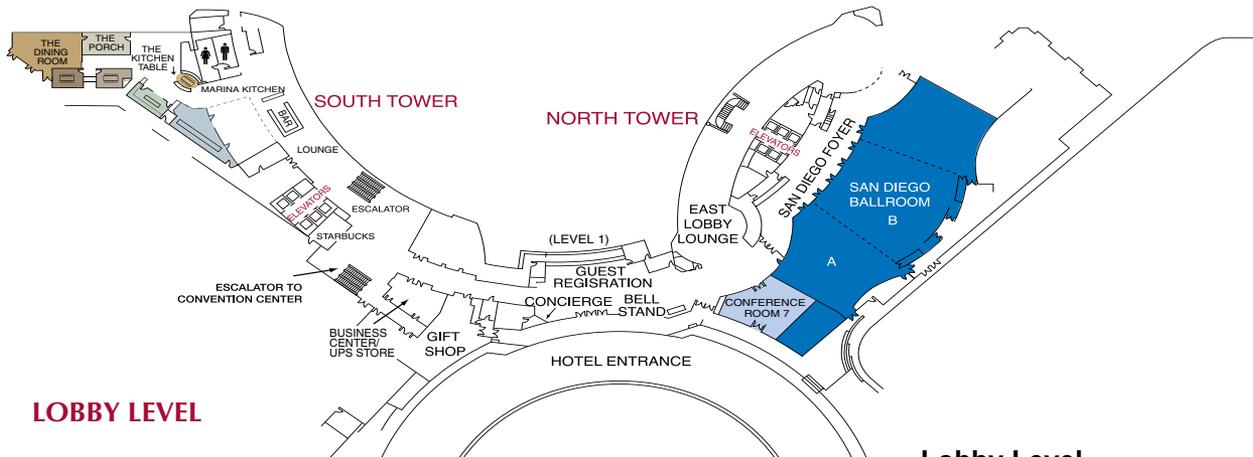
LEVEL 1



Level 1

Committee and Business Meetings
LMD Luncheon

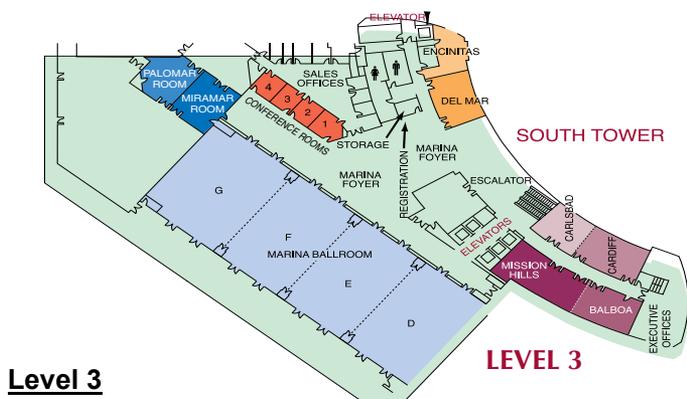
MEETING INFORMATION



LOBBY LEVEL

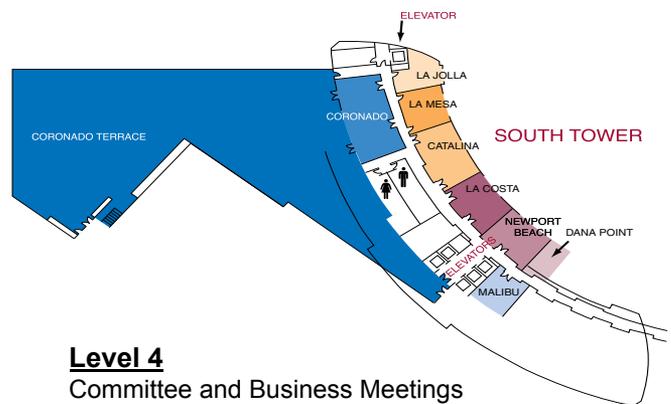
Lobby Level

Fellows and Invited Guests Reception
Women in Science Breakfast
Speed Networking Event
EPD/EMPMD Luncheon



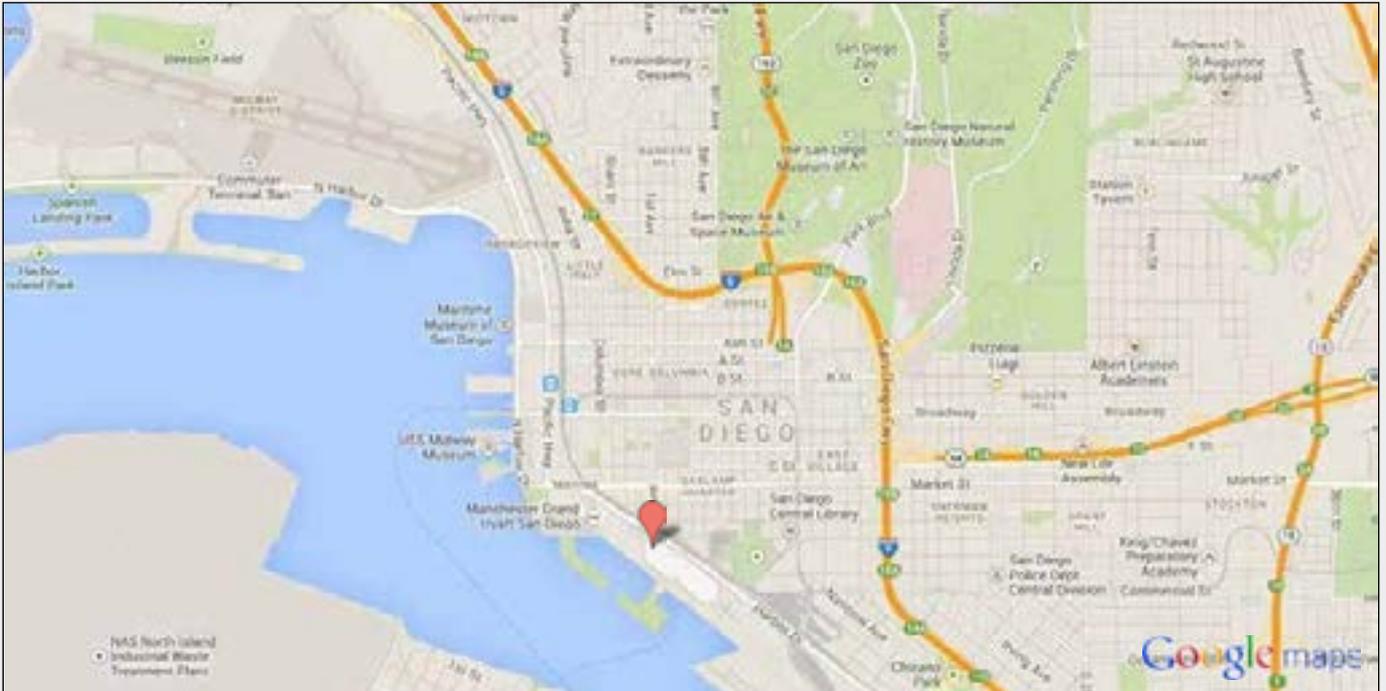
Level 3

LEVEL 3



Level 4

Committee and Business Meetings



 : San Diego Convention Center/ Marriott Marquis, San Diego Marina

ARMORTECH

Aluminum contact technology just got better

Harbison-Walker Refractories Company unveils the next generation in monolithic refractory technology for aluminum contact applications. Check out the ARMORTECH family of products which include:

- ◆ **Ultimate resistance to molten aluminum penetration**
- ◆ **Aluminum contact capabilities up to 2500°F**
- ◆ **Exceptional physical properties at aluminum melting temperatures**

Harbison-Walker Refractories - A full line supplier of refractory materials for primary and secondary aluminum Brick and monolithic solutions - dense, lightweight, aluminum-resistant, specialty materials

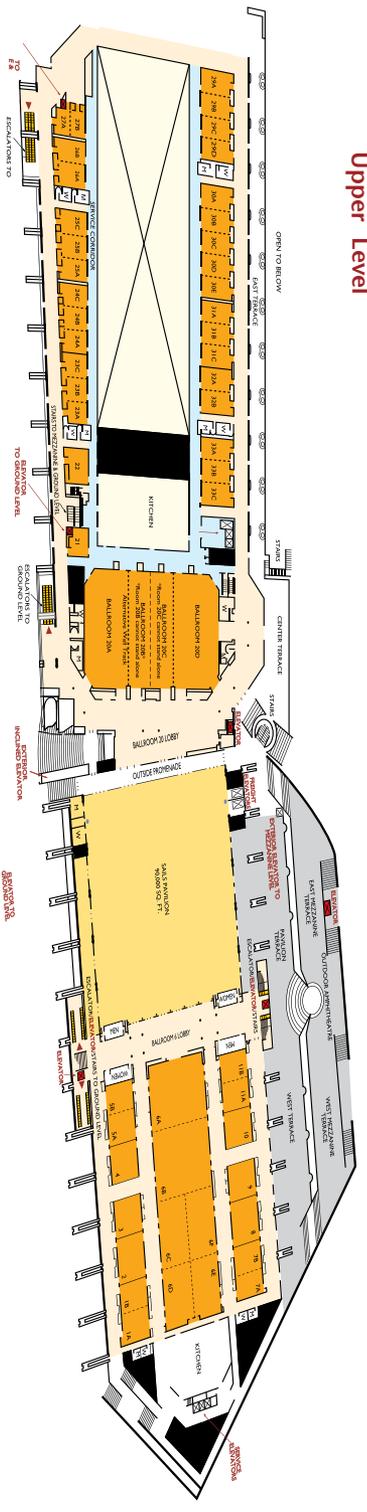
Visit - www.hwr.com

Mail - aluminum@hwr.com

Harbison-Walker Refractories Co.

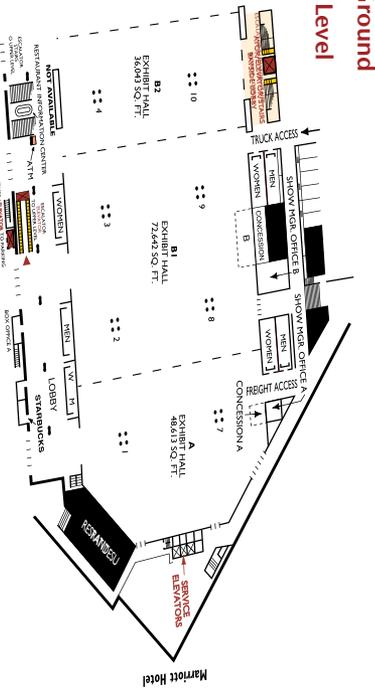
AP Green, Harbison-Walker and NARCO are part of the ANH Refractories Family of Companies





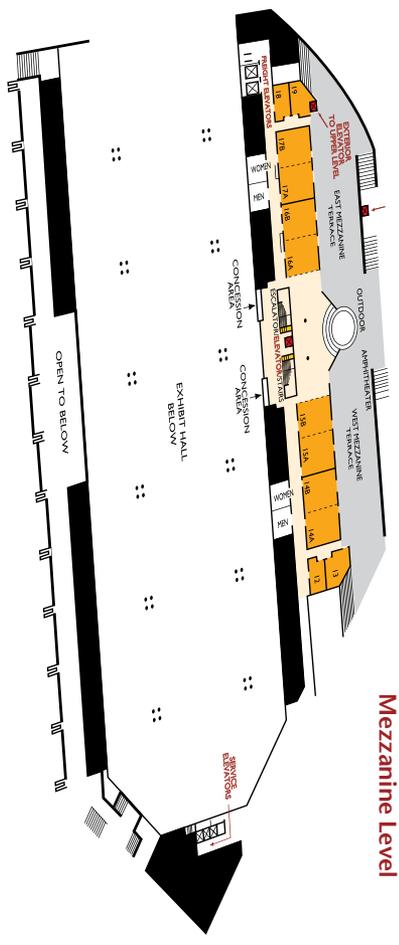
Upper Level

- Upper Level**
- Programming Support Desk
- Foundation Booth
- Presenters' Coffee
- Poster Sessions
- Keynote Presentations & Sessions
- Technical Programming Sessions



Ground Level

- Ground Level**
- TMS 2014 Registration
- TMS2014 Exhibition
- TMS Information Center
- TMS Help Desk
- Comic-tantium!



Mezzanine Level

- Mezzanine Level**
- Materials Bowl Competition
- Meeting of the Membership
- Student Networking Mixer
- Technical Programming Sessions

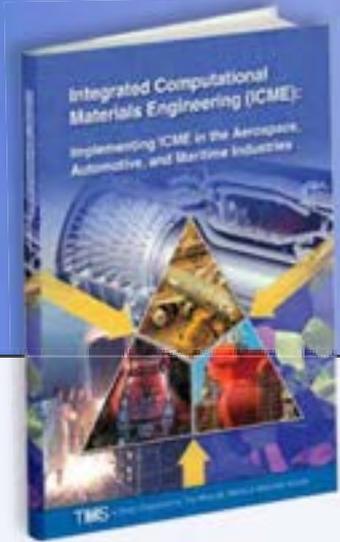


MAP & FLOORPLAN OF SAN DIEGO CONVENTION CENTER

MEETING INFORMATION



Find Out How to Accelerate the Development of Advanced Materials



Pick up a FREE hard copy of:

Integrated Computational Materials Engineering (ICME)

Implementing ICME in the Aerospace, Automotive, and Maritime Industries
at the **TMS Information Center (Booth #118)** in the **Exhibit Hall**

Integrated Computational Materials Engineering (ICME): Implementing ICME in the Aerospace, Automotive, and Maritime Industries is the groundbreaking study, organized by TMS, that puts practical guidance at your fingertips for implementing an ICME-Accelerated Product Development Program within three years. This resource compiles the insights, knowledge, and experience of nearly 50 recognized technical experts in ICME and its allied fields, while also building on the broad recommendations of the 2008 U.S. National Academies report that first defined ICME as a new sub-discipline in materials science with enormous power to revolutionize materials-intensive product development cycles.

Report Highlights

- Definition and description of the ***fundamental building blocks needed to implement an ICME-Accelerated Product Development Program within three years*** for the automotive, aerospace, and maritime sectors, but portable to other industries as well.
- ***Frameworks that include flow diagrams and extensive tables*** detailing: necessary actions throughout the product development cycle; entry and exit points of the ICME portions of the cycle; suggestions for computational models and tools to use at various steps; necessary skill sets and personnel; and key decision points.
- ***In-depth recommendations for addressing ICME implementation issues that cut across all industrial sectors.*** These include building a business case for ICME, effectively integrating design into the manufacturing and materials development process, and issues related to verification and validation.
- ***Identification of more than 50 near-term application opportunities*** for implementing ICME in the aerospace, automotive, and maritime industries.

Who Should Read the Report?

The report is useful for a broad variety of stakeholders within and beyond the materials community:

- Professionals and leaders in the aerospace, automotive, and maritime industries.
- Professionals in other materials-intensive industries.
- University professors, researchers, students, and higher-level managers.
- Government scientists and engineers, program officers, and policy makers.

* Sponsored by the U.S. Department of Defense, the U.S. Department of Energy, and the U.S. National Science Foundation, this project also strongly supports the U.S. Materials Genome Initiative's (MGI) goals to accelerate the discovery and deployment of new products and increase global competitiveness.

TMS

Aluminum Keynote Session

Innovation in the Aluminum Industry
Supply Chain: How Will We Move
On to the Next S Curve?

Monday, February 17 • 8:30 a.m. to Noon
San Diego Convention Center – Room 6A

Over several decades, research and development within the aluminum industry has been constrained by factors such as cost cutting and “rationalization” following company mergers and take-overs. This leads to a question: *How will the industry support the work required to move on to the next innovation S curve? In other words, how do we get to the critical mass of R&D required to achieve breakthroughs that will lift industry environmental and energy-efficiency performance to maximize future growth potential?* Relevant issues include: *What work is needed? Who will do it? What are the possible funding models? What are the roles for international cooperation and government facilitation?*

In this keynote session, senior speakers from industry and academia will:

- explore these topics from the perspective of smelting and alumina production
- look at the role of external research providers
- present a case study from one integrated aluminum company
- look at innovation in the industry from a North American perspective
- examine innovation within the broader mining industry.

The presentations will be followed by a panel discussion. Chair: **Barry Sadler**, Net Carbon Consulting Pty Ltd

SPEAKERS AND TOPICS



Barry Welch, Universities of New South Wales (Australia) & Auckland (New Zealand)

“Focus Areas and Possible Options for Aluminum Smelter Performance Enhancement”

This provocative presentation will highlight how the emphasis on good smelting technology

fundamentals has declined, yet numerous opportunities exist for economic and performance enhancements. Speculative examples will be promoted for addressing the energy and operating inefficiencies that persist in smelting. After 80 years of research, there is no

alternative process for aluminum production other than electrowinning with a carbon anode in a molten fluoride electrolyte, so this is where this presentation will be focused.

Over the last 60 years or so, the aluminum smelting industry has moved from largely fully vertically integrated companies (i.e. bauxite mining to semi-finished products) to the much more stand-alone industry we have today. Due to a number of diverse factors, such as the dependency of independent smelters on purchased technology, this has diminished the “pool” for developing innovative ideas. Progress in technology development became retarded by a “copy and paste” syndrome. This has led to an inward thinking industry that has not looked “over-the-fence” to the advances made in other industries that have the potential for application in large modern smelters.

The scientific understanding of smelting principles has reached such a low that the industry does not even correctly define what an anode effect is. While computer modeling is widely used to refine cell designs, it has significant limitations such as the use of simplified background equations that are based on data developed for quite different electrolytes, cell designs and operating conditions to those now used. Little attempt has been made to bridge the gap between business units especially since short term financial performance carries higher rewards for management as compared with longer-term, process wide improvements. But needs and solutions are there if the industry opens its eyes and appreciates the long-term benefits of further research and development.

Gerald I.D. Roach, Alcoa World Alumina Australia “Further Innovation in the Bayer Process – Is This a Reality or a Pipe Dream?”

Over the last century, the rapid growth in aluminum demand has seen the Bayer process, used to produce smelter-grade alumina, increase in both output and efficiency. Innovation within the Bayer process related to equipment (e.g. fluidized bed calciners), yield, solid/liquor separation techniques, energy reduction, as well as making the process essentially a continuous operation, has resulted in a major reduction in operating costs and often (but not always) capital cost. There have been similar major improvements in safety and the environmental footprint. With such a mature process, the expectation might well be that the top of the S curve has been reached in many of the various unit operations, and the overall process, such that there is not much more room for improvement or innovation.

The presentation will review improvements within the Bayer Industry and look at whether there is potential for really significant innovation to move the Bayer Process on to a new S curve. In particular, a major factor in the cost of alumina production (both capital and operating cost) is the smelting processes' product quality requirements. In order to move forward and identify, and then develop, new innovations it is important that these innovations can be shown to be implementable processes. That requires significant process input and continual close cooperation between industry and academia or the relevant research organization (even between the refinery and their own research group) to ensure the project does not stray from its primary goal. It is important to develop a model for such cooperative work to ensure that there is a win/win scenario for all parties as often views of what constitutes a successful project, and expectations from the project, can be markedly different.



Mark P. Taylor, University of Auckland
“The Role of External Research Groups in Aluminum Industry Innovation”

How can teams in external research labs, removed from production environments, become involved in innovation? The knowledge and skills of specialist teams in a field like aluminum production must be valuable to smelters. But how can these groups participate as and when stimuli for change are experienced at smelters?

This talk addresses these questions with real examples from the last decade, and some thoughts about the innovations needed next, as well as, how they can be accelerated.



Martin Segatz, Hydro Aluminium Deutschland GmbH
“Hydro’s Innovation Engine - From Idea to Business”

This presentation will look at how Hydro’s aspiration to become technology leader in key areas of its vertically integrated aluminum business has been the driving force to establish a durable network of intense cooperative research relationships with preferred academic and industrial partners. A focus on business-critical development needs like energy efficiency in primary metal or new product development opportunities in the Rolled Product sector, have allowed Hydro to maximize the effect of its R&D efforts, creating business value

and opportunities. A systematic approach to innovation management and well-defined internal development processes have resulted in major technology and business achievements. By professionally managing contracts and IP, Hydro has been able to cooperate successfully and efficiently with research and funding partners even in key areas of core technology and thus extend its own capabilities significantly. The potential for the wider application of Hydro’s approach within the industry will also be discussed.



Alton Tabereaux, Alcoa (retired)
“Innovation in the North American Aluminum Industry”

In 2013, Alcoa celebrated its 125-year anniversary of the company started by its innovative legacy of founders Charles Martin Hall and Alfred Hunt. This presentation will look at the innovations and evolution of aluminum smelting technology in North America since that creation with an emphasis of the impact of corporate and government R&D programs on the process. Specific examples of R&D work within the North American aluminum smelting industry will be looked at, including the inert anode, carbothermic reduction, new metal product development, and large-scale cell development.



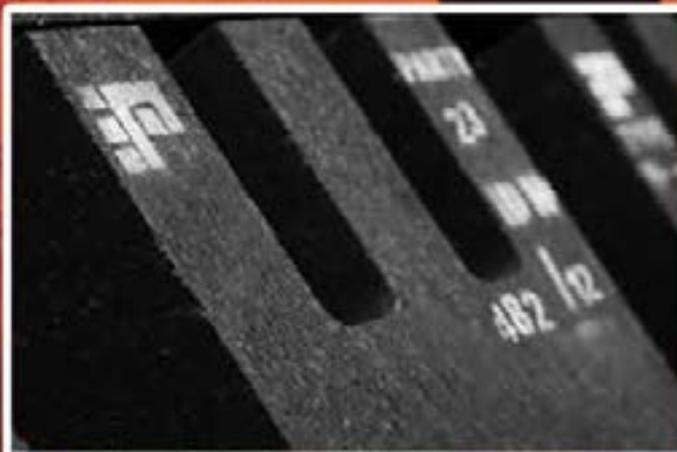
Geoff Bearne, Rio Tinto Technology and Innovation
“Innovation in Mining – Rio Tinto’s Mine of the Future™ Program”

The mining industry faces growing challenges to meet the increasing demand for metals and minerals, driven largely by industrialization and urbanization in the emerging world. Today, quality mineral deposits are harder to find, are often remotely located and tend to be of lower ore grade. Step change innovation is required to maintain competitive advantage in the face of rising costs and declining productivity. Rio Tinto’s Mine of the Future™ program aims to create value by finding better ways to mine through new technologies. Challenges for the mining industry and Rio Tinto’s innovation initiatives are discussed, while reflecting upon some experiences in the aluminum industry.



EPM GROUP

**Best quality
for aluminium
industry**



Cathode blocks



Cold ramming masses



Pre-baked anodes

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E-mail: energoprom@energoprom.ru
www.energoprom.ru

TMS2014

Keynote Session

World Views on Materials and Manufacturing Innovation: Regional Perspectives from Government Organizations

SESSION SPOTLIGHT

The session will close with an interactive, moderated panel discussion immediately following the individual presentations, in which the audience will be provided the opportunity to ask questions of the keynote speaker panel.

Tuesday, February 18 • 8:30 a.m. to 12:50 p.m.
San Diego Convention Center – Room 6A

PROGRAM ORGANIZERS

Charles Ward, Air Force Research Laboratory
Hani Henein, University of Alberta

SPONSORED BY

TMS Materials Innovation Committee

Combining recent emphasis on manufacturing advances and acceleration of materials innovations, this special keynote session will focus on the current state of the art and future international landscape of *integrated materials and manufacturing innovations*. In particular, it will examine regional perspectives from leading government organizations around the world. Esteemed speakers will present overviews of their current activity areas, as well as previews of what is on the horizon for materials science and engineering innovations, especially as they relate to manufacturing.

KEYNOTE SPEAKERS WILL INCLUDE:

- **Cathy Foley**, Chief of CSIRO Materials Science and Engineering Division, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia
- **Han Dong**, Vice Chief Engineer of China Iron & Steel Research Institute Group (CISRI Group), Vice President of Central Iron & Steel Research Institute (CISRI), Director of National Engineering Research Center of Advanced Steel Technology (NERCAST), China
- **G. Sundararajan**, Director, ARCI, Hyderabad & Professor, IIT Madras, India
- **Yoshio Akimune**, General Manager Technical Planning Division Innovative Structural Materials Association, Japan
- **Laurie Locascio**, Director, Material Measurement Laboratory, The National Institute of Standards and Technology (NIST), USA

SAVE THE DATES!

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

TMS Annual Meeting & Exhibition

2015	Orlando, Florida	March 15-19	Swan & Dolphin Hotels, Walt Disney World
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

Materials Science & Technology (MS&T)

2014	Pittsburgh, Pennsylvania	October 12-16	David L. Lawrence Convention Center
2015	Columbus, OH	October 4-8	Greater Columbus Convention Center
2016	Salt Lake City, UT	October 24-27	Salt Palace Convention Center



HONORARY SYMPOSIA

MEETING INFORMATION

A Lifetime of Experience with Titanium Alloys: A Structural Materials Division Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer

Monday, February 17 to Thursday, February 20
San Diego Convention Center – Room 1A



The successful and widespread industrial use of titanium alloys may be traced in large part to the significant contributions these three gentlemen have made to the field of titanium metallurgy. Their careers spanned several decades in academia and industry where they served as mentors, organizers, advisors, managers, distinguished fellows, directors, and presidents. The first talk of each morning in this three-day, six-session symposium will feature an invited speaker highlighting the lifetime and achievements of each honoree.

Celebrating the Megascale: An Extraction & Processing Division Symposium in Honor of David G.C. Robertson

Monday, February 17 to Thursday, February 20
San Diego Convention Center – Room 16A
(Room 3 and 16A will be used for Thursday afternoon sessions)



At a time when maintaining metals production is increasingly important to modern society, producers face the challenge of remaining profitable within an unpredictable global economy, while minimizing environmental impact and energy consumption. Economies of scale are becoming increasingly important

in this setting, leading to larger and larger plants – some reaching the megascale – and requiring the support of highly skilled professionals. Professor David G.C. Robertson has devoted his career to the education of highly skilled metallurgical professionals and to the engineering of all types and sizes of metallurgical processes, particularly those involving molten metals. His research has focused on transport phenomena of smelting, refining, and solidification processes, particularly mass transfer, kinetics, and fluid dynamics.

Robertson Honorary Dinner

Monday, February 17, 6:00 p.m. to 9:00 p.m.
Cost: \$130

(tickets will be available for purchase until Monday at noon)

Held in conjunction with the “**Celebrating the Megascale: An Extraction & Processing Division Symposium in Honor of David G.C. Robertson,**” this event will honor the career and contributions to the field of extraction and processing technology (specifically pyrometallurgy) of David Robertson. Join us for a social, three-hour dinner cruise.

The evening’s itinerary will be as follows:

Boarding at Marriott Marina - 5:45 p.m. to 6:00 p.m.

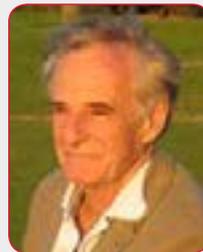
Social and Dinner - 6:00 p.m. to 8:45 p.m.

Dock and Disembark at Marriott Marina

8:45 p.m. to 9:00 p.m.

Dynamic Behavior of Materials VI – A Structural Materials Division Symposium in Honor of Professor Marc Meyers

Monday, February 17 to Thursday, February 20
San Diego Convention Center – Room 3



The dynamic behavior of materials encompasses a broad range of phenomena associated with extreme environment and with relevance to technological applications in military and civilian sectors. The field of dynamic behavior of materials comprises diverse phenomena such as deformation, fracture,

fragmentation, shear localization, damage dissipation, chemical reactions under extreme conditions, and processing (combustion synthesis; shock compaction; explosive welding and fabrication; shock and shear synthesis of novel materials). It has evolved considerably in the past twenty years and is now at a stage where its significance to all classes of materials including metals, ceramics, polymers, and composites is becoming relevant.

TMS 2015

It’s not too soon to plan for next year. The TMS 2015 Annual Meeting & Exhibition will be held March 15–19, 2015 in Orlando, FL. Please visit the Travel Planners Booth in Hall A to book your hotel for 2015.

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HONORARY SYMPOSIA

Progress towards Rational Materials Design in the Three Decades Since the Invention of the Embedded Atom Method: A Materials Processing & Manufacturing Division Symposium in Honor of Michael I. Baskes

Monday, February 17 to Wednesday, February 19
San Diego Convention Center – Room 30E



This symposium will honor the remarkable contributions of Michael I. Baskes to the field of computational materials science. Along his career Baskes has pioneered the theoretical and numerical development of models of materials behavior, with emphasis on the role played by atomistic defects on the anisotropic

behavior of engineering materials. His many contributions have been critical to establishing a strong connection between models and experiments, and to bridging different scales in the pursuit of robust multiscale models with experimental integration.

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for Success

Make TMS Your Professional Partner for Success

TMS membership is a career investment. By attending TMS2014, you are joining a prestigious network of 12,000 scientists and engineers in the minerals, metals, and materials communities.

The Value of TMS Membership

TMS members receive access to more than \$2,000 worth of exclusive, members-only benefits designed to expand your professional horizons.

Stop by the TMS Information Center in the Exhibit Hall to learn how to make the most of your TMS membership in 2014.



TECHNICAL TOUR

QUANTUM DESIGN TOUR

Thursday, February 20 • 10:00 a.m. to Noon
 Departs from San Diego Convention Center
COST: \$25

During this one-hour tour, visitors will see Quantum Design's manufacturing and testing facilities, applications laboratory, and newly completed, whole-building, high-pressure helium recovery and liquefaction system. Wear closed-toe shoes, please.

ABOUT QUANTUM DESIGN

Founded in 1982, Quantum Design is a privately held corporation that develops and markets automated temperature and magnetic field testing platforms for materials characterization. These systems offer a variety of measurement capabilities and are in widespread use in the fields of physics, chemistry, biotechnology, materials science, and nanotechnology. A broad product line allows Quantum Design to address the scientific and operational requirements of researchers around the world. For more information, visit www.qdusa.com.





MONDAY

2014 William Hume-Rothery Award Lecture

Monday, February 17 • 8:30 a.m. to 9:10 a.m.

San Diego Convention Center – Room 6C



Rainer Schmid-Fetzer, Clausthal University of Technology

Lecture Title: “Phase Diagrams - The Beginning of Wisdom”

About the Topic: “Phase diagrams are the beginning of wisdom - not the end of it”. This famous quotation coined by Sir William Hume-Rothery

has guided the author’s materials research for many years. The main part of this presentation aims at an audience with no prior exposure to phase diagrams and all those interested in “my way” of concisely teaching “How to Read and Apply Phase Diagrams.” Starting from the very basics of phase diagrams and phase equilibria we will go through reading unary, binary and ternary phase diagrams, including liquidus projections, metastable phase diagrams and useful choices of state variables in phase diagrams. Thermodynamic simulation of Equilibrium versus Scheil solidification is also covered and the path from initial off-equilibrium state towards equilibrium is emphasized. Applications demonstrated include alloy solidification, heat treatment and soldering. An example “beyond” phase diagrams is given by the competition between thermodynamic and nucleation barrier for secondary phase selection.

Institute of Metals/Robert Franklin Mehl Award

Monday, February 17 • 8:30 a.m. to 9:10 a.m.

Marriott Marquis and Marina – Marina Ballroom E



Jagdish Narayan, North Carolina State University

Lecture Title: “Frontiers in Thin Film Epitaxy and Novel Nanostructured Materials”

About the Topic: This talk focuses on designing and processing of novel nanostructured materials

of controlled size and orientation, and defects and interfaces. Thin film growth modes can be precisely controlled to produce zero-, one-, two-, and three-dimensional nanostructures. The orientation control requires epitaxy across the misfit scale which is achieved by the paradigm of domain matching epitaxy. The DME paradigm emphasizes the matching integral multiples of lattice planes across the film-substrate interface, where

domains are separated by dislocations and the misfit in between the integral multiples is accommodated by the principle of domain variation. This talk emphasizes on two-dimensional pseudomorphic metamaterials where the chemical composition is controlled by growth parameters and the structure is determined by the structure of the substrate which provides a template for thin film growth. The thickness (1-5 monolayers) can be controlled manipulating strain and internal thermodynamic free energy.

Extraction & Processing Division Distinguished Lecturer

Monday, February 17 • 8:40 a.m. to 9:20 p.m

San Diego Convention Center – Room 16B



Brajendra Mishra, Colorado School of Mines

Lecture Title: “How Critical is Recycling for Critical Materials’ Sustainability?”

About the Topic: Rare earths metals, including yttrium and scandium, are being increasingly

used in clean energy technologies, colored phosphors, lasers and high intensity magnets. There are important defense applications such as fighter jet engines, missile guidance systems and space based satellite and communication systems based on these metals. The commitment to clean energy technologies by governments and the projected growth in power and transportation sectors across the globe ensure that the demand for rare earth metals and compounds would continue to escalate. This demand implies that, to ensure unhindered technological innovation, it is essential to possess secure supply chains for rare earth elements. Therefore, rare earth metals are not rare but critical. The United States continues to be one of the largest consumers and importer of rare earths and the trend is expected to continue as the demand increases. In order to ensure secure rare earth supply and attenuate supply-demand imbalance post 2014, it is not only necessary to encourage and support exploration of newer reserves, build a rare earth stockpile, but it is also of utmost importance to look at opportunities to recycle and reuse Rare Earth Elements from secondary sources, such as post-consumer and manufacturing process wastes. This discourse will describe the technological developments made to convert these valuable resources into functional manufactured materials for lighting industry, automotive and petroleum refining catalysts, and high density permanent magnets.



SPECIAL LECTURES

Why Scientists Are Needed In Policy Making: A Face-to-Face with Congressional Fellows

Monday, February 17 • 3:30 p.m. – 4:30 p.m.

TMS Information Center – Booth #118 Hall B1



Megan Brewster

2013-2014 TMS-MRS Congressional Science and Engineering Fellow
United States Senate Committee on Energy and Natural Resources Fellow



Ed Herderick

Director of R&D
Rapid Prototype + Manufacturing (rp+m)
Chair, Public & Governmental Affairs Committee
2009-2010 TMS-MRS-ACerS Congressional Science and Engineering Fellow

About the Event

Meet with TMS/MRS Congressional Science and Engineering Fellows past and present. This year's fellow, Megan Brewster, and past fellow Edward Herderick will discuss why policy often requires scientific knowledge to be effective. They will share their experiences of being at the interface between technology, policy, and application in Washington, D.C. and discuss why a Congressional Fellowship is an important consideration for your career path. Following their presentations, ample opportunity will be available for discussion, questions, and answers.

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Dr. Ali H A M Al Zarouni

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SPECIAL LECTURES

TUESDAY

Extraction & Processing Division/Materials Processing & Manufacturing Division Joint Luncheon Lecture

Tuesday, February 18 • Noon to 1:30 p.m.
Marriott Marquis and Marina – San Diego Ballroom A



John Allison, University of Michigan

Lecture Title: “MGI and ICME - Here to Stay or Just ‘The Next Big Thing?’”

FOR YOUNG PROFESSIONALS

Young Professional Luncheon Lecture

Tuesday, February 18 * Noon to 2:00 p.m.
Marriott Marquis and Marina – Coronado



Daniel Gianola, Assistant Professor, University of Pennsylvania

Lecture Title: “Fostering International Interactions and Collaborations in Materials Science and Engineering”

About the Topic: Research and education in science and engineering have no boundaries. Despite geopolitical conflict and a diversity of global cultural influences, science and engineering transcends all and speaks a common language – progress that evolves the frontiers of knowledge and technology. A cultural shift is upon us that we would be remiss not to embrace – according to a recent National Academy of Sciences report, as of 2007, China became second only to the U.S. in the estimated number of people engaged in scientific and engineering research and development.

I propose to moderate a discussion on strategies – implemented from the laboratory to governmental policy – to promote rich, engaging, and longstanding global interactions in materials science and engineering. Topics to be discussed include (i) defeating parochial views to research and education, (ii) mechanisms (both present and future) for engagement in international activities, and (iii) opportunities for student exchange and promoting global citizenship in the next generation of scientists and engineers.



Michele Manuel, Assistant Professor, University of Florida

Lecture Title: “Back to Basics: Putting the ‘E’ back in MSE Through the Use of Design and Entrepreneurship”

About the Topic: Engineering has always provided the backbone and motivational driving force to pursue advancements in materials science. However, in the era of reducing credit hours and declining budgets, it has been difficult to maintain a high level of engineering content within the materials science and engineering (MSE) curriculum. Initiatives such as the Materials Genome and Integrated Computational Materials Engineering (ICME) has proven that science content can be tied to engineering skills in an efficient and streamlined manner without sacrificing quality of either ideology. This talk will focus on methods to overcome the gap created when science and engineering must merge together and showcase examples of successful pedagogical practices that illustrate the idea that integrating design and entrepreneurship further enhances and deepens a student’s understanding of scientific concepts and engineering-based critical thinking.

The Young Professional Luncheon Lecture is open to all meeting attendees; however, optional boxed lunches are available only to those who ordered in advance.

JIM Scholar

Tuesday, February 18 • 3:55 p.m. to 4:15 p.m.
San Diego Convention Center - Room 19



Hiromichi T. Fujii, Tohoku University

Lecture Title: “Microstructure and Mechanical Properties in Dissimilar Joint between Al Alloy and Cu by Ultrasonic Welding”

About the Topic: Dissimilar joints between 1050 Al alloy and Cu were prepared by ultrasonic spot welding technique under various welding conditions to understand the characteristics of joints. Tensile shear strength of the joints increased with increasing the welding energy up to 0.3 kJ. The strength was saturated around 1.3 kN when the welding energy was applied more than 0.3 kJ. The joint welded with sufficiently high energy was fractured at base metal of Al alloy during tensile shear strength test. The interface microstructure in Al alloy consists of severely deformed region due to ultrasonic vibration. In addition, the fine and equiaxed



grains were observed near the joint interface in the specimens fractured at base metal. Moreover thin Al₂Cu intermetallic compound layer with the thickness of 40 nm was found to be formed at the joint interface in the specimens fractured at base metal.

WEDNESDAY

Vittorio de Nora Prize for Environmental Improvements in Metallurgical Industries

Wednesday, February 19 • 11:25 a.m. to 11:50 a.m.
San Diego Convention Center - Room 13



Abdalla Ahmed Al Zarouni, Manager, Technology Process Development, Dubai Aluminum Co. Ltd.

Lecture Title: "Reducing Greenhouse Gas Emissions during Aluminium Smelting through Development and Implementation

of Improved Control Strategies and Operational Practices"

About the Topic: It is well known that aluminium smelters are one of the main producers of the PFC emissions during smelting process. The PFC emissions are produced during a known event called anode effect. The aluminium industry has recognized this issue and worked on reducing PFC emissions levels over the past several years. At DUBAL, a lot of work has been done in this regard over the past several years which resulted in achieving low PFC emissions. This paper shows the approach taken to reduce PFC emissions, the work done to translate the fundamental understanding of the root causes into practical applications, and finally the changes made to the various systems and practices to cascade the knowledge and changes in the systems and practices to the potlines.

Light Metals Division Luncheon Lecture

Wednesday, February 19 • Noon to 1:30 p.m.
Marriott Marquis and Marina – Temecula



William Joost, U.S. Department of Energy

Lecture Title: "Connecting the Science and Engineering of Vehicle Weight Reduction"

Structural Materials Division Luncheon Lecture

Wednesday, February 19 • Noon to 5:30 p.m.
San Diego Convention Center – Room 6A



Gerhard Fuchs, University of Florida

Lecture Title: "The Project Azorian Senior Project – Combining History, Politics and Metallurgy"

About the Topic: In his luncheon lecture, Gerhard Fuchs of the University of Florida will expand on the popular August 2013 *JOM* article, "Cold War Thriller Brings Classroom Theory to Life." The focus of Fuchs's talk is Project *Azorian*, a real-life espionage tale of a lost Soviet nuclear submarine and one of the most ambitious covert engineering feats of the modern age, made even more complicated by a metallurgical failure. Immediately following the luncheon will be a special showing of the theatrical documentary, *Azorian: The Raising of the K-129*.

Fuchs's lecture and the documentary screening are open to all TMS2014 attendees. Advance tickets are required for a reserved table seating and catered lunch.

TMS is a member-driven society, so your volunteerism is what makes it work. Volunteering with TMS is a great way for you to broaden your technical interests, strengthen your resume, and give back to the profession. But don't take our word for it. Visit the TMS Information Center in Booth #118 in the Exhibit Hall for more information on opportunities to participate and grow the society.





NETWORKING, STUDENT, AND SOCIAL EVENTS

SUNDAY

TMS2014 Materials Bowl

Sunday, February 16

Elimination Rounds: **Noon to 4:00 p.m.**

Championship Round: **8:00 p.m. to 8:30 p.m.**

San Diego Convention Center – Room 14AB



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

Meet the Candidate

Employment Poster Session

Sunday, February 16 • 6:30 p.m. to 7:45 p.m.

San Diego Convention Center – Room 12

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. All meeting attendees are welcome at this session.

TMS Meeting of the Membership

Sunday, February 16 • 7:00 p.m. to 8:00 p.m.

San Diego Convention Center – Room 16AB

At this informal gathering, 2013 TMS President Elizabeth Holm will provide a brief overview of the society's major initiatives from the past year and a preview of the organization's future. Suveen Mathaudhu, Program Manager, U.S. Army Research Office, and the volunteer curator for COMIC-tanium, will then provide a look at how the scientific subtext underlying comic mythology and comic-inspired movies can be used to excite and educate the public about the impact of minerals, metals, and materials research and development on society. The TMS Foundation will also recognize the "materials superheroes" profiled in the COMIC-tanium exhibit.

Student Mixer

Sunday, February 16 • 8:30 p.m. to 10:30 p.m.

San Diego Convention Center – Room 15AB

This informal social event allows students to interact with each other and with professional members in a relaxed—and fun—setting. Refreshments are provided. Dancing is optional.

MONDAY

Women in Science Breakfast

Monday, February 17 • 7:00 a.m. to 8:00 a.m.

Marriott Marquis and Marina – San Diego Ballroom A

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

Tickets are required for this event.

Connect Zone

**Monday, February 17 to Thursday, February 20
8:30 a.m. to 4:00 p.m.**

San Diego Convention Center – Sails Pavilion

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 TMS2014 attendees. This open area will act as an informal networking center, workspace for attendees, a convenient location to meet with colleagues, and as the site of a Job Board for posting resumes and job openings. 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.

Speed Networking & Luncheon

Monday, February 17 • 11:30 a.m. to 1:30 p.m.

Marriott Marquis and Marina – San Diego Ballroom A



Significantly enhance your networking opportunities with this exciting, high-impact, and structured networking event that produces exceptional results for participants.

NETWORKING, STUDENT, AND SOCIAL EVENTS



A match-making system pairs innovation with traditional networking methods to identify mutually beneficial and knowledge-building relationships among professionals.

Due to the nature of this event, only those who have registered in advance can participate.

Student Poster Contest Judging

**Monday, February 17
3:30 p.m. to 5:30 p.m.**

San Diego Convention Center – Sails Pavilion



Browse the student poster displays and ask questions of the contest participants at the Student Poster Contest Judging Session.

President's Welcoming Reception

Monday, February 17 • 5:00 p.m. to 6:30 p.m.
San Diego Convention Center- Hall B1

All attendees are invited to meet in the exhibit hall for appetizers, beverages, and networking with exhibitors and other colleagues.

Young Professional Happy Hour Reception

Monday, February 17 • 6:00 p.m. to 7:00 p.m.
Marriott Marquis and Marina – Coronado

This reception provides young professionals the opportunity to network with more experienced TMS members in a relaxed, social atmosphere.

TUESDAY

Student Career Forum

Tuesday, February 18 • 2:30 p.m. to 4:30 p.m.
Marriott Marquis and Marina – Catalina

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 materials.

Exhibit Hall Happy Hour

Tuesday, February 18 • 4:30 p.m. to 5:30 p.m.
San Diego Convention Center- Hall B1

All attendees are invited to gather in the exhibit hall for appetizers, beverages, and networking with exhibitors and other colleagues.

WEDNESDAY

Young Professional Technical Division Poster Contest

**View Posters During Poster Session
and Gallery Hours**
San Diego Convention Center – Sails Pavilion

View technical posters submitted by early-career professionals in each of the five TMS technical divisions: Electronic, Magnetic & Photonic Materials; Extraction & Processing; Light Metals; Materials Processing & Manufacturing; and Structural Materials. Posters will be judged, and the winner in each division will be awarded \$500.

CONTINUING EDUCATION



CONTINUING EDUCATION SHORT COURSES & WORKSHOPS

The 2014 meeting has a number of continuing education courses scheduled on February 16. Registrations will be accepted onsite for these courses through 8:30 a.m. on Sunday. For a complete list of offerings please visit www.tms.org/tms2014. Onsite registrations can be completed

in Hall A (TMS2014 Registration). All continuing education courses will take place at the Marriott Marquis and Marina. A continuing education help desk is located in the Marriott's Marina Ballroom Foyer in the South Tower on Sunday from 7:00 a.m. to 10:30 a.m. for those needing assistance finding a classroom or with course questions. Onsite registrations can also be completed at this help desk.



143rd TMS-AIME Annual Awards Banquet

including Dinner, Live Entertainment, Awards Ceremony, and Installation of 2014 President

Tuesday, February 18 • Reception: 6:00 p.m.

San Diego Convention Center – Bayside Lobby

Awards Ceremony Seating Begins: 6:30 p.m.

San Diego Convention Center – Room 6A

Banquet Dinner: 7:45 p.m.

San Diego Convention Center – West Terrace



Featuring live entertainment from Scottish fiddle legend **Alasdair Fraser** and cello ace **Natalie Haas**.

Recognizing Excellence in Minerals, Metals, and Materials

The 2014 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 both TMS and the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME), of which TMS is a member society.

The evening will consist of three parts.

1. Award winners and their guests will be welcomed at a cocktail reception.
2. Following the reception, participants will be seated for the awards ceremony, where individual winners will be honored for their accomplishments. A professional photographer will be on hand to capture these moments.
3. Following the ceremony, those participants who have purchased banquet tickets will proceed outside to the West Terrace for a nautical-themed dinner and a beautiful view of the San Diego Bay. Dinner guests will be treated to live entertainment from Scottish fiddle legend Alasdair Fraser and cello ace Natalie Haas.

How to Attend

All TMS Annual Meeting attendees are welcome to attend the ceremony portion of the evening to support friends and colleagues receiving awards and to join in honoring their accomplishments.

Advance tickets are required for admission to the dinner portion of the evening. Your ticket includes admission to the cocktail reception, awards presentations, three-course dinner with wine and dessert, and live entertainment. All venues are fully accessible for guests with disabilities.

Installation of the 2014 TMS President



Hani Henein

Hani Henein, researcher and professor at the University of Alberta in Edmonton, Canada, will be installed as the 2014 TMS President during the TMS-AIME Annual Awards Banquet. As Vice President of TMS, Henein worked to foster the development and involvement of young professionals in TMS and hopes to continue that work in his new role as president.

Henein has been a TMS member for 31 years and currently serves as the Society's Vice President. He has been a member of the TMS Financial Planning Committee and served as the TMS Board Director of Programming. As a member of the Society, Henein served on the TMS Board as the Director of Programming from 2009 to 2012 and also has served on numerous technical committees.

The main thrust of Henein's research is in the area of advanced materials processing, developing new near-net shape processing routes. He is the director of the Advanced Materials and Processing Laboratory and a fellow of the Canadian Academy of Engineers and the Canadian Institute of Mining, Metallurgy and Petroleum, as well as a Killam Research Fellow. He carries out research projects in collaboration with colleagues at McMaster University, Ecole des Mines de Nancy (France), Bremen University (Germany) and INSA de Lyon (France).

Henein earned his B.S. and M.S. degrees from McGill University in Montreal, Canada, and his doctorate from the University of British Columbia. He is a registered Professional Engineer in the Province of Alberta. He has one patent, published 250 technical papers, and edited nine books. Additionally, he has received numerous professional awards and honors.

Excellence and Inspiration: TMS Honors the Best of the Best

Recognizing TMS members who have distinguished themselves from a field of excellence is a focal point of every TMS Annual Meeting. To further underscore the significance of its highest professional honors, TMS has opened the TMS-AIME Honors and Awards Ceremony to all TMS2014 attendees. The program will take place on Tuesday, February 18, and offers the rare opportunity to see and hear some of the most influential figures in the field at the pinnacle of their careers.

The ceremony will be hosted by some of TMS's most esteemed members:

- Ray Peterson, 2009 TMS President - presenting the awards celebrating the achievements of TMS's young and mid-career members.
- Tresa Pollock, 2005 TMS President and 2009 TMS Fellow - honoring those receiving TMS's pinnacle awards.
- Carolyn Hansson, 1997 TMS Fellow - presenting the 2014 Class of TMS Fellows.

"For our more senior members, we believe (the 2014 awards ceremony) will offer a memorable, moving occasion to celebrate the excellence of their colleagues. We hope members early in their careers will take advantage of this chance to congratulate mentors and be inspired to strive for similar heights themselves."

- **Elizabeth Holm**, 2013 TMS President

SOCIETY AWARDS

2014 TMS Fellows

John Allison

Professor, University of Michigan

Kevin Hemker

Professor and Chair, Johns Hopkins University

Enrique Lavernia

Dean and Distinguished Professor, University of California

Michel Rappaz

Professor, École Polytechnique Fédérale de Lausanne

Ruslan Z. Valiev

Professor, UFA State Aviation Technical University

Alexander Scott**Distinguished Service Award****Barry Welch**

Retired, Welbank Consulting

Application to Practice Award**Iver Anderson**

Senior Metallurgist, Ames Laboratory

2014 Brimacombe Medalists**Louis G. Hector Jr.**

Technical Fellow, General Motors Research and Development

C. Robert Kao

Professor, National Taiwan

University

Diana Lados

Associate Professor, Worcester Polytechnic Institute

Eric M. Taleff

Professor and Charlotte Maer Patton Centennial Fellow in Engineering, University of Texas

Bruce Chalmers Award**Pradeep K. Rohatgi**

Distinguished Professor, University of Wisconsin-Milwaukee

Cyril Stanley Smith Award**Anthony Rollett**

Professor, Carnegie Mellon University

Early Career Faculty Fellow Award**Daniel Gianola**

Assistant Professor, University of Pennsylvania

Michele Manuel

Assistant Professor, University of Florida

Educator Award**Donald Sadoway**

John F. Elliott Professor of Materials Chemistry, Massachusetts Institute of Technology

Hong Yong Sohn

Professor, University of Utah

Institute of Metals**Lecturer & Robert****Franklin Mehl Award****Jagdish Narayan**

John C. Fan Distinguished Chair Professor, North Carolina State University

Leadership Award**John Lewandowski**

Arthur P. Armington Professor of Engineering II, Case Western Reserve University

Morris Cohen Award**Carlos Levi**

Professor, University of California

Vittorio de Nora Prize**for Environmental****Improvements in****Metallurgical Industries****Abdalla Ahmed Al Zarouni**

Senior Manager, Technology Development, Dubai Aluminum Co. Ltd.

William Hume-Rothery Award**Rainer Schmid-Fetzer,**

Professor, Clausthal University of Technology

AIME AWARDS

AIME Honorary**Membership****David Seidman**

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

AIME Champion H. Mathewson Award**Neal Evans**

Consultant, Proton Power Inc.

Philip J. Maziasz

Distinguished Research Scientist, Oak Ridge National Laboratory

John P. Shingledecker

Senior Project Manager, Electric Power Research Institute

Michael J. Pollard

Engineering Specialist, Caterpillar Technical Center

AIME Robert Lansing Hardy Award**Dallas Trinkle**

Associate Professor, University of Illinois

AIME-EPD James Douglas Gold Medal**Barry Welch**

Retired, Welbank Consulting

AIME Henry deWitt Smith Scholarship**Somayah Pasebani**

Student, University of Idaho

Jacob McMurray

Student, University of Tennessee



143rd TMS-AIME Annual Awards Banquet

DIVISION AWARDS

ELECTRONIC, MAGNETIC & PHOTONIC MATERIALS DIVISION (EMPMD)

Distinguished Service Award

Raymundo Arroyave
Associate Professor, Texas
A&M University

Laura Turbini
Consultant, International
Reliability Consultants

Distinguished Scientist/Engineer Award

Michael McHenry
Professor, Carnegie Mellon
University

John Bardeen Award Ramamoorthy Ramesh

Deputy Director, Oak Ridge
National Laboratory

JEM Best Paper Award

Auriane Etienne
Universite et INSA de Rouen

Emmanuel Cadel
Universite et INSA de Rouen

Agnes Lina
EDF R&D

Laurent Creton
EDF R&D

Philippe Jean Pareige
Universite et INSA de Rouen

EXTRACTION & PROCESSING (EPD)

Distinguished Lecturer Award

Brajendra Mishra
Professor, Colorado School of
Mines

Distinguished Service Award

Thomas Battle
Senior Metallurgist, Midrex
Technologies

Science Award

Nazmul Huda
Lecturer of Mechanical
Engineering, Macquarie
University

Jamal Naser
Associate Professor,
Swinburne University of
Technology

Geoffrey Brooks

Head, High-Temperature
Processing Group, Swinburne
University of Technology

Markus A. Reuter

Professor, Outotec Oyj, Aalto
University

Robert W. Matusiewicz

Technical Development
Manager-TSL Smelting,
Outotec Limited

Technology Award

Gwang Seop Lee

Processing Technology Team,
Korea Resources Corporation

Masahito Uchikoshi

Assistant Professor, Tohoku
University

Kouji Mimura

Associate Professor, Tohoku
University

Minoru Isshiki

Professor Emeritus, Tohoku
University

LIGHT METALS DIVISION (LMD)

Distinguished Service Award

Cynthia Belt
Energy Management
Consultant

Technology Award

Gary Tarcy
Manager, Smelting Research
and Development, Alcoa Inc.

Light Metals Award

Mikhail Lukin
Reduction and Technical
Manager, RUSAL
Kubikenborg Aluminium AB

Richard Jeltsch

Jeltsch Consulting

Light Metals Subject Award-Alumina and Bauxite

Alexander Senaputra
PhD Candidate, Curtin
University

Phillip Fawell

CSIRO

Franca Jones

Senior Lecturer, Curtin
University

Peter Smith
CSIRO

Light Metals Subject

Award - Electrode

Technology for

Aluminum Production

David Molenaar

Research Consultant, CSIRO

Tony Kilpatrick

CSIRO

Alex Montalto

Royal Melbourne Institute of
Technology University

Light Metals Subject

Award - Warren Peterson

Cast Shop for Aluminum

Production

Dmitry Eskin

Professor, Brunel University

Noe Alba-Baena

Professor, Autonomous
University of Ciudad Juarez

Light Metals Subject

Award – Recycling

Byoung-Gi Moon

Senior Researcher, Korea
Institute of Materials Science

JOM Best Paper Award

Laura Talens Peiró

Research Fellow, INSEAD
Europe Campus

Gara Villalba Méndez

Professor, Universitat
Autònoma de Barcelona

Robert U. Ayres

Professor Emeritus, INSEAD
Europe Campus

Energy Best Paper Award – Professional

Donna P. Guillen

Distinguished Staff Engineer,
Idaho National Laboratory

Energy Best Paper Award – Student

Jarrold D. Milshtein

Graduate Research Assistant,
Massachusetts Institute of
Technology

Soumendra Basu

Associate Division Head,
Boston University

Srianth Gopalan

Associate Professor, Boston
University

Uday B. Pal

Professor, Boston University

Magnesium Technology Best Paper – Application Award

Matthias Gieseke

Laser Zentrum Hannover e.V.

Christian Noelke

Laser Zentrum Hannover e.V.

Stefan Kaierle

Laser Zentrum Hannover e.V.

Volker Wesling

Clausthal University of
Technology

Heinz Haferkamp

Laser Zentrum Hannover e.V.

Magnesium Technology Best Paper - Fundamental Research Award

Bin Li

Assistant Research Professor,
Mississippi State University

Bo-Yu Liu

PhD Candidate, Xi'an
Jiaotong University

Zhi-Wei Shan

Executive Director, Xi'an
Jiaotong University

Magnesium Technology Student Paper Award

Victoria Miller

Graduate Student, University
of California

Tresa Pollock

Professor, University of
California

Magnesium Technology Best Poster Award

David Fullwood

Associate Professor, Brigham
Young University

Michael Miles

Associate Professor, Brigham
Young University

Timothy Ruggles

Brigham Young University

Travis Rampton

Brigham Young University

Raja K. Mishra

Staff Research Scientist,
General Motors Research
Laboratory

DIVISION AWARDS (cont.)

MATERIALS PROCESSING & MANUFACTURING DIVISION (MPMD)

Distinguished Service Award

James Sears

Senior Process Engineer-Additive Manufacturing, GE Global Research Center

Distinguished Scientist/Engineer Award

Narendra Dahotre

Distinguished Research Professor and Chair, University of North Texas

STRUCTURAL MATERIALS DIVISION (SMD)

Distinguished Service Award

Eric Ott

Principal Engineer, GE Aviation

Distinguished Scientist/Engineer Award

G. Robert Odette

Professor, University of California, Santa Barbara

JOM Best Paper Award

Teresa E. Perez

Engineer, Tenaris Research Center

Nicholas Kirkland

Assistant Professor, Nagasaki University

David S. Wong

Project Manager, University of Auckland

Zhenke Teng

Research Engineer, United States Steel Corporation

MPMD Young Leader Professional Development Award Winners

Srinivasa Rao Bakshi

Assistant Professor, Indian Institute of Technology Madras

Amber Genau

Assistant Professor, University of Alabama

Paul Gibbs

Post Doctoral Research Associate, Los Alamos National Laboratory

J. Brian Jordon

Assistant Professor, University of Alabama

Lan Li

Assistant Professor, Boise State University

Nan Li

Staff Scientist, Los Alamos National Lab

SMD Young Leader Professional Development Award Winners

Jennifer Carter

Assistant Professor, Case Western Reserve University

Juan Pablo Escobedo

Lecturer (Assistant Professor), University of New South Wales

Jessica A. Krogstad

Postdoctoral Fellow, Johns Hopkins University

Benjamin Morrow

Postdoc Research Associate, Los Alamos National Laboratory

John Nychka

Associate Professor and Associate Chair Undergraduate Studies, University of Alberta

Corinne Packard

Assistant Professor, Colorado School of Mines

Michael R. Tonks

Computational Microstructure Science Group Lead, Idaho National Lab

YOUNG LEADER AWARDS

Young Leader

International Scholar to JIM

Michele Manuel

Assistant Professor, University of Florida

Young Leader

International Scholar from JIM

Hiromichi T. Fujii

Assistant Professor, Tohoku University

EMPMD Young Leader Professional Development Award Winners

Saryu Fensin

Technical Staff Member, Los Alamos National Lab

Shih-kang Lin

Assistant Professor, National Cheng Kung University

Yan Li

Senior Package Failure Analysis Engineer, Intel Corporation

Fan-Yi Ouyang

Assistant Professor, National Tsing Hua University

Amit Pandey

Postdoc Research Associate, Rolls Royce LG Fuel Cell

Hans Shin

Materials Engineer, Pacific Testing Labs Inc

Eva Zurek

Assistant Professor, State University of New York

EPD Young Leader Professional Development Award Winners

Salvador Barriga

Research Engineer & Technical Leader, Infinium Inc

Yulia Meteleva-Fischer

Postdoctoral Researcher, Materials Innovation Institute M2i

Zhiwei Peng

Research Assistant Professor, Michigan Technological University

LMD Young Leader Professional Development Award Winners

Cheuk Yi Cheung

Postdoctoral Fellow, University of New South Wales

In-Ho Jung

Associate Professor, McGill University

STUDENT AWARDS

TMS Best Paper Contest - Graduate

First Place:

Kaiyuan Yu

Texas A&M University

Second Place:

Yi Wang

University of Tennessee

TMS Best Paper Contest - Undergraduate

First Place:

Harshal Agrawal

Visvesvaraya National Institute of Technology

J. Keith Brimacombe Presidential Scholarship

Kathleen Chou

University of Michigan

ADDITIONAL AWARDS

Acta Materialia Gold Medal Award

Robert O. Ritchie

H. T. & Jessie Chua Distinguished Professor of Engineering, University of California

Acta Materialia Materials & Society Award

Karl A. Gschneidner, Jr.

Anson Marston Distinguished Professor, Iowa State University

New Resources for Your Bookshelf:

TMS 2014 Annual Meeting Proceedings

Every full-conference attendee of the TMS 2014 Annual Meeting & Exhibition receives free, exclusive access to the Wiley Online Library to download individual proceedings articles. In addition, the collected proceedings can be downloaded from TMS.org as a single PDF file including all published proceedings books or as separate PDF files for each proceedings publication. Complimentary access to the 2014 proceedings publications is available for six months, and then standard pricing applies.

Visit the **TMS Information Center** (Exhibit Booth #118) or the **TMS2014 Help Desk** near Registration with any questions about accessing the collected proceedings.

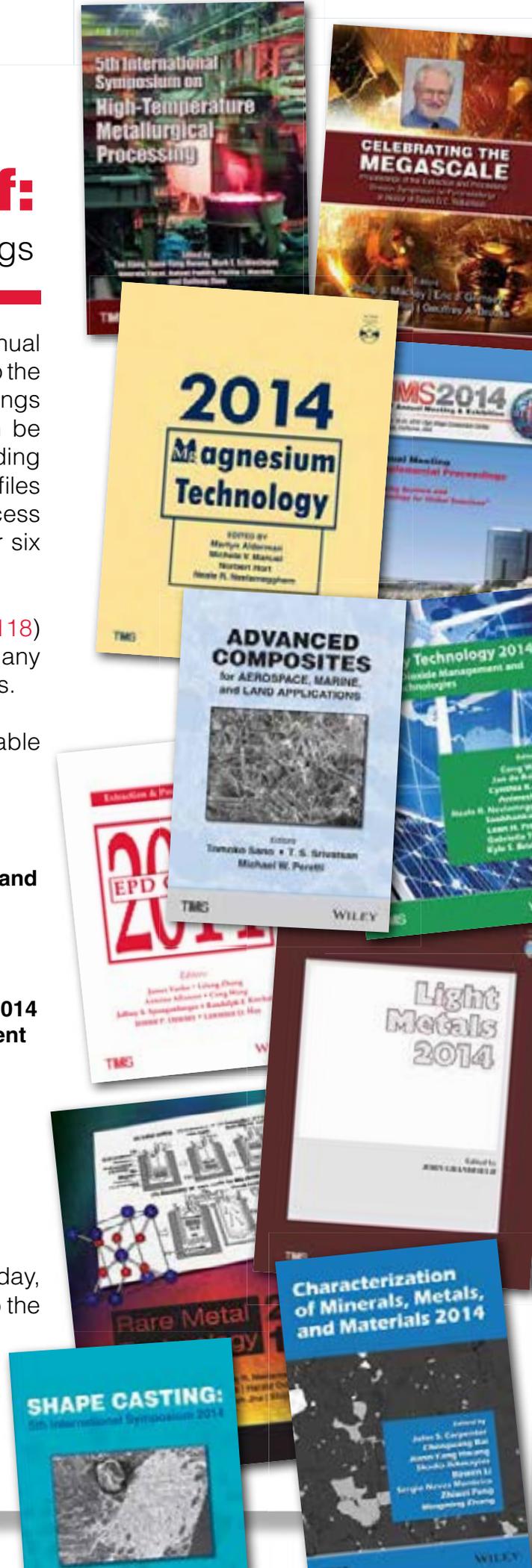
Print editions of the following volumes are now available for purchase in the Wiley booth:

- 5th International Symposium on High-Temperature Metallurgical Processing
- Advanced Composites for Aerospace, Marine, and Land Applications
- Celebrating the Megascala: Proceedings of the Extraction and Processing Division Symposium on Pyrometallurgy in Honor of David G.C. Robertson
- Characterization of Minerals, Metals, and Materials 2014
- Energy Technology 2014: Carbon Dioxide Management and Other Technologies
- EPD Congress 2014
- Light Metals 2014
- Magnesium Technology 2014
- Rare Metal Technology 2014
- Shape Casting: 5th International Symposium 2014
- TMS 2014 Supplemental Proceedings

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TMS



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About the Honoree

Ellen Swallow Richards (1842-1911) was the first female student to attend MIT, earning a degree in chemistry in 1873. She was also an accomplished professional who took an active role outside of the laboratory and was elected the first female member of the American Institute of Mining Engineers (today's American Institute of Mining, Metallurgical and Petroleum Engineers). She is also recognized as the founder of the field of ecology. Beyond her pioneering achievements, she remained dedicated to public service and was known as a fervent advocate for women's education and professional opportunities.

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Abundant research demonstrates that a diverse talent pool increases productivity, competitiveness, and creativity – but this diversity is often untapped relative to professionals in the minerals, metals, and materials communities. To address the issue, The Minerals, Metals & Materials Society (TMS) is coordinating the efforts of several associations within the science and engineering community to organize this inaugural two-and-one-half day summit in 2014 (with follow-on actionable outputs) that will feature:

- **U.S. Government, Academia, and Industry Attendees:** Up to 300 professionals will gather to focus on the underrepresentation of gender and race from the U.S. Government, academic, and industry perspectives
- **Workshop-like Format:** Parallel sessions will provide an interactive forum for engaging on specific topics such as communication, mentoring, and creating a diverse workplace
- **Panel Discussions:** Crosscutting issues of diversity and inclusion will be addressed by panels of representatives from throughout the minerals, metals, and materials communities
- **Skills and Tools Development:** Special sessions will provide skills and tools for early-career, mid-career, and senior management professionals to implement in their workplaces
- **Follow-on Resources:** The output from the summit will be captured and used to develop toolkits and guidance subsequently available via the conference website

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Elizabeth Holm, Carnegie Mellon University (Chair)

Viola Acoff, University of Alabama

Eliana Fu, Titanium Metals Corporation

Mary Korpi, Newmont Mining Corporation

Alexis Lewis, Naval Research Laboratory

Kray Luxbacher, Virginia Tech

Jonathan Madison, Sandia National Laboratories

Michele Manuel, University of Florida

Wayne Jones, University of Michigan (Advisory Committee Chair)

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www.tms.org/diversitysummit**



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Monday, February 17 Noon to 6:30 p.m.
Tuesday, February 18 10:00 a.m. to 5:30 p.m.
Wednesday, February 19 9:00 a.m. to 1:00 p.m.

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EXHIBITING COMPANIES

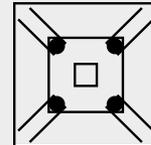
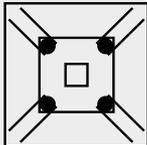
(as of January 16, 2014)

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Charging Station

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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 aluminium. 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 #202

A leading supplier in high temperature ceramic products made of Alumina, Fused Quartz, and Zirconia. Our products range from crucibles, furnace tubes, plates and discs, thermocouple insulators, sample pan for thermal analysis, 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 #200

For over four decades, Advanced Dynamics (ADCL) has supplied our global customer base with state-of-the-art material handling systems for carbon plants and cast houses. Our handling technology includes fully automated or semi-automated equipment for anode handling and cleaning, aluminum ingot and T-Bar handling, sawing and packaging systems. We also have experience in specialty systems for the magnesium, copper, zinc, steel and lead industries. 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, "Our ingenuity delivers productivity" when you think of ADCL for your next project. Please look at our new website www.advanceddynamics.com for the latest news and information.

Almex, USA

Booth #127

Specializing in the most advanced and innovative aluminum casthouse solutions, Almex works to add value to every project. We deliver equipment and technology founded on Performance, Simplicity, and Safety.

Aluminium International Today

Booth #502

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 a sample copy visit www.aluminiumtoday.com/sample-issue. 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@quartzltd.com web www.aluminiumtoday.com

Aluminium Times

Booth #117

Aluminium Times was launched in 1998 with the objective to promote equipment, consumables and products to managers and operators involved in purchase decisions and employed with aluminium primary or secondary producers, rolling mills, forgers or extruders anywhere in the world. The magazine is sent to them free of charge. Since the journal was founded there have been three surveys undertaken to determine reader's requirements of an international magazine serving the aluminium industry. With 5,300 copies posted every issue the 2013 reader survey suggests that on average 4 readers see each copy of Aluminium Times. 84% become aware of new products through Aluminium Times whilst 17% have purchased products after first reading it in Aluminium Times. Aluminium Times is published five times a year and features during the year aluminium industry maps and directories covering the sectors of rolling, extrusion, primary and secondary production. Our booth will feature copies of our latest issues.

AluminiumNetwork.com

Booth #516

AluminiumNetwork.com, 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 optimisation, The support can be on a freelance basis and for as long as it is needed.

ANDRITZ Metals Inc.

Booth #104



COMPANY DESCRIPTIONS

ArcelorMittal

ArcelorMittal is the world's leading steel and mining company. Guided by a philosophy to produce safe, sustainable steel, it is the leading supplier of quality steel products in all major markets including automotive, construction, household appliances and packaging.

ArcelorMittal operates in 60 countries and employs about 260,000 people worldwide. ArcelorMittal Rodange – Hot Rolling Mill located just outside Luxembourg City - is the single largest producing site of Cathode-Collector bars in the world. The company introduced the Low Resistivity, LR Grade Steel for the Pot application in 2001, and then the Ultra Low Resistivity Steel, ULR Grade, in 2010. ArcelorMittal is a major supplier to all the main Aluminium producing Groups, and many Independent Aluminium Smelters.

ArcelorMittal Rodange provides machining and finishing of Cathode-Collector Bars. First Copper Cored Collector Bar (CCCB) was manufactured in 2004, and the company is supplying increasing quantities of this type of Cathode-Collector Bar, as the advantages of CCCBs become increasingly clear. The ULR Grade steel is also appropriate for use in Anode Assemblies – as both Spiders and Stubs - displaying significantly lower Resistance/Resistivity than Cast Steel Spiders, and as compared to the commercial steel grades usually used for Stubs.

We would be happy to discuss and cost your designs for these items and look forward to meeting you at our Booth.

Booth #504 ATR

The ATR National Scientific User Facility offers materials science engineers and scientists the opportunity to test materials in an irradiation environment and perform analyses on the irradiated specimens. Capabilities available include three test reactors and a host of post irradiation examination facilities across the United States. Non-proprietary research is cost-free to U.S. university led teams.

Access to facilities is through a solicitation and review process: The kinds of research solicited include, but are not limited to, advanced materials for high performance reactor systems, understanding light water reactor core materials including austenitic steels and nickel alloys, determining properties of material joints after exposure to a neutron irradiation environment and the applicability of nanostructured materials to radiation resistant applications. To learn more about ATR NSUF, please visit our website at: <http://atrnsl.inl.gov>.

Booth #431

AUMUND Foerdertechnik GmbH Booth #420

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

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- Xu Jinxiang, China Magnesium Association
China Magnesium Development Report in 2013
- Karen McBeth, Platts Metals Group
State of Aluminum: Impact on Magnesium
- Jean Marc Segaud, BMW – Quo Vadis Magnesium?
Competitiveness of Structural Components in BIW

TECHNICAL SPEAKERS

- David Klaumuenzer*, Volkswagen
Lightweight Strategy
- Graham Nation, Ventana Aerospace Products
Markets and Evolution
- Diego Val Andres, Grupo Antolin/ES
New Magnesium Applications
- Alexis Van Maercke, European Commission
Magnesium as Critical Raw Material in the EU

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bath material:

- 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
- Reduced investment and operating cost

B&P Process Equipment

Booth #528

B&P Process Equipment provides green anode paste mixing systems such as Batch Mixers or Continuous Kneaders (CK-CP Kneaders). Their rugged design, unique efficient mixing mechanism, coupled with easy access for maintenance, maximize paste throughput and minimize plant downtime. B&P's Carbon Paste Kneader is your most cost-effective solution for anode paste production. No competitive system features the efficiency or throughput of a B&P Carbon Paste Kneader. With the highest production output, paste density, and lowest specific anode consumption, B&P sets the standard. These units are provided from 7 to 75 tons per hour. No matter which system is supplied, the result is a homogeneous mixture, with optimum mixing and dispersion, resulting in highest green paste density for consistent quality anodes.

Bloom Engineering Company, Inc.

Booth #318

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.

Boise State University Materials Science & Engineering

Booth #228

Boise State University Materials Science and Engineering offers innovative undergraduate and graduate programs that facilitate interdisciplinary research with Physics, Chemistry, Biology, Electrical and Computer Engineering, and Mechanical and Biomedical Engineering. Our faculty members are nationally and internationally recognized in the areas of novel materials, biological sciences, and nanotechnology. We promote close student collaboration with our faculty on funded research in areas such as semiconductor device reliability, nanoscale fabrication, microelectronics packaging, shape memory alloys, DNA nanotechnology, energy, biomaterials, materials characterization, and materials modeling. Our program has developed strong community support including a nearly \$13 million contribution from the Micron Foundation dedicated solely to our Ph.D. program. This level of support allows us to foster many opportunities to make significant scientific contributions to cutting edge research.

Boreal Laser

Booth #443

Boreal Laser of Canada is the leading supplier of Hydrogen Fluoride (HF) monitors for environmental and process control in primary Aluminum smelters worldwide. The GasFinder2 and GasFinderFC portable systems are used for HF emissions reduction studies and pot line roof monitoring. GasFinderMC is a fixed, multi-channel system that monitors multiple pot room roof paths for improved environmental performance. GasFinderMC is also used in HF scrubber systems (GTC, FTC) for multiple duct and stack monitoring in order to optimize scrubber performance. Primary benefits of the GasFinder technology are self-calibration, robustness, ease-of-use and industry-leading technical support. Today more than 200 GasFinder systems continuously monitor over 1000 HF measurement points in 60 smelters in 25 countries worldwide. Boreal introduces the NEW GasFinder3 portable HF monitor at TMS 2014.

Bose Corporation

Booth #116

Bose Corporation manufactures the ElectroForce® test instruments using proprietary BOSE® linear motor technology. ElectroForce test instruments were designed specifically for advanced materials research including: fatigue and fracture mechanics, dynamic mechanical analysis (DMA), and creep/relaxation testing. Applications are extremely diverse and include: engineered materials (rubbers/elastomers, plastics, metals, composites, etc.), orthopaedic and cardiovascular medical devices, biomaterials, bone, soft tissues, etc. Visit our booth for a demonstration!

Buss ChemTech

Booth #407

Buss ChemTech AG (BCT) offers fully dedicated applications for Green Anode Production based on 60 years of experience. Covering:

- Modular and fully continuous running Green Anode Plants e.g. KAS Carbon Plant
- Equipment and engineering for dry material handling, horizontal paste production up to the formed green anode
- Pitch storage and melting Plants based on an exclusive and very unique technology
- Original BCT Paste Kneader known as the most advanced kneading application Our highly skilled and experienced engineers are available to provide you the highest level of support to execute inspections, process studies, training and all kind of technical support.



COMPANY DESCRIPTIONS

CA Picard International

Booth #514

C.A. Picard Engineering GmbH & Co. KG Production, Service and Sales of Wear and Spare Parts Components for Anode Paste Mixers for the Aluminum Industry. C.A. Picard Engineering GmbH & Co. KG is manufacturer of high class equipment and spare parts for various industries with wear intensive products and, therefore, the leading expert for various surface protection methods and wear protection materials. We are certified according to DIN ISO 9001 and our internal processes guarantee that we supply stable high quality according international norms and regulations. The high requirements for special wear protected surfaces for the production of anode paste were the driving force of C.A.Picard to further develop existing wear protection materials and application methods to extend life time and reduce production costs. We offer optimized wear and spare parts at economical prices. Send us your enquiry! We offer alternatives, no compromises! Visit us in San Diego, CA at TMS, booth No. 514

California Nanotechnologies

Booth #119

Cal Nano is an industry leader in Nano Material Engineering, known as the preeminent Research, Development and Production firm in designing and manufacturing superior performance components. Incorporating and innovating the latest material sciences with multiple patented production techniques, Cal Nano produces cost-effective components with unparalleled strength and quality, making them the only choice when absolute performance is demanded. www.calnanocorp.com

CAMECA Instruments, Inc.

Booth #520

For more than 50 years, CAMECA has provided advanced elemental and isotopic micro analytical instruments for the geoscience research community. Come to Booth 520 to see the highlights and latest offering of 50 years of Electron Micro Probe (EPMA), Secondary Ion Mass Spectrometry (SIMS), and Atom Probe Tomography (APT) excellence.

Canadian Neutron Beam Centre (CNBC)

Booth #106

The Canadian Neutron Beam Centre (CNBC) offers access to world-leading expertise and facilities for analyzing stress and texture in engineering materials using neutron diffraction. The CNBC enables hundreds of clients to apply neutron beams to advance their programs of materials R&D.

Carl Zeiss X-ray Microscopy, Inc.

Booth #129

ZEISS expanded the ZEISS Microscopy business group, the only manufacturer of light, electron and X-ray microscopes, by acquiring US-based Xradia, Inc. in July, 2013. X-ray microscopy (XRM) provides non-destructive, three-dimensional imaging of diverse samples in synchrotrons and premier research laboratories worldwide. With unique solutions for research

and routine inspection in the materials and life sciences fields, natural resources, electronics, and other industrial sectors, ZEISS's XRM solutions deliver resolution down to 50 nm, superior contrast capabilities and groundbreaking 4D/in situ imaging for a wide variety of samples and applications.

CIMM

Booth #422

CIMM Group Ltd. is China's leading supplier of Materials for Primary Aluminium Smelters and Alumina Refineries worldwide. Aluminium Fluoride Insulation Refractory Bricks Carbon products for aluminium smelters. "Our goal is very simple. To provide the best integration of production, quality and price. We not only provide stand-alone products to our customers. More than anything, we are focusing on the delivery of an entire 'customized sales and production system' supported by our experienced sales and technical experts from the receipt of our customer's orders, throughout our entire production process to the final product for the corresponding alumina refinery, aluminum smelter or producer. Our 'customized sales and production system' makes our CIMM personnel proud and is valued by our important customers worldwide."

Claudius Peters

Booth #403

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.

COMIC-tanium

Booth #124

This museum-quality retrospective was developed as a fun, interactive educational experience—of interest to anyone who has ever read a comic book, watched a superhero movie, or wondered at the possibilities of materials technology. COMIC-tanium is a traveling exhibit that debuts at TMS2014. Later, it will tour the country, bringing real-life minerals, metals, and materials science and engineering to the public in a fun and interesting way. The exhibit is a major outreach initiative of the TMS Foundation and the Toonseum of Pittsburgh.

CompuTherm LLC

Booth #500

CompuTherm LLC, established in 1996, develops CALPHAD type of modeling tools in the framework of ICME. The PANDAT 2013 version is released with three modules: PanPhaseDiagram for the calculation of multi-component 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 a variety of multi-component alloys.

Coperion GmbH

Booth #518

Coperion GmbH is the competent partner for all bulk materials handling solutions around and within the smelter. The company offers solutions to the aluminium producing industry that have proven to be extremely efficient and reliable.

The company supports its customers from the first project concept through a wide range of services to realization and start-up of bulk materials plants such as for example retrofit solutions and provides after-sales support.

Coperion has the necessary expertise for every process stage along the entire process chain in manufacturing of primary alumina. In each process step, the challenges demand plenty of experience, specialist competence and flexibility

CSM Instruments

Booth #429

CSM Instruments offers a wide range of instruments and testing services for surface mechanical properties characterization, including: Hardness Testers, Scratch Testers and Tribometers. 3D-imaging options are available with the ConScan or AFM objective. CSM manufactures standalone instruments as well as testing modules that can be combined together on an automated platform. CSM Instruments is proud to announce the launch of its new Nano Tribometer (NTR2) and Nanoindentation Tester (NHT2).

Dubal/EMAL

Booth #201

A state-owned corporation, DUBAL operates the world's largest single-site primary aluminium smelter using pre-bake anode technology (over one million mtpa). DUBAL's Jebel Ali complex includes a 2,350 MW power station, a large carbon plant, casthouse operations, a water desalination plant, and other facilities. High quality aluminum products are made in three main forms: foundry alloy for automotive applications; billets for construction, industrial, transportation and automotive forging; and high purity aluminium for electronics and aerospace. DUBAL's proprietary reduction technologies rank among the best available.

EBSD Analytical

Booth #522

EBSD Analytical provides advanced microstructural materials characterization services using EBSD/EDS/SEM techniques. We specialize in providing texture, grain size, ODF, grain boundary analysis, and phase ID including elemental composition. With over 17 years experience in EBSD/EDS, having 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 #426

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 #329

Eirich Machines designs, manufactures & supplies batch & continuous mixers & systems for the processing of raw materials, compounds, waste & residues in a wide range of industries. Our complete line of products for mixing, agglomerating, pelletizing, grinding, granulating & 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.

Energoprom Group

Booth #111

The Group is the fifth largest world producer of carbon and graphite products.

Evans Analytical Group

Booth #506

Evans Analytical Group (EAG) is the global leader in surface analysis and materials characterization services. Analytical techniques available include: GDMS, ICPMS, XPS, XRD, SEM, TEM, SIMS, and XRF. EAG provides fast turn-around time, superior data quality and excellent results. EAG has over 20 locations in Asia, Europe and the U.S. www.eag.com

FEI

Booth #214

FEI Visualization Sciences Group is the leading provider of high-performance 3D visualization software for engineers, scientists, and software developers in materials science, life sciences, natural resources and more. FEI is showcasing Avizo® Fire 3D visualization and analysis software for materials science. Avizo Fire software 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, etc. Ideal for: synthetic porous materials, polycrystalline metals, geomaterials, and many more.



COMPANY DESCRIPTIONS

Fives Solios

Booth #315

Fives Solios designs and supplies process equipment and turnkey plants for:

- Coal Tar Distillation
- Reduction: Gas Treatment Centers on electrolysis pots and Bath Processing Plants
- Carbon: High Capacity Green Anode Plants, Pitch storage and processing, Liquid Pitch Terminal, Firing & Control Systems as well as Fume Treatment Centers for anode baking furnaces
- Casthouse: Melting and Holding furnaces including water cooling systems, Heat Treatment furnaces and Genios, the latest technology of metal moving system to stir, transfer and cast.

FLSmith

Booth #415

FLSmith 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. FLSmith combined the industry's leading brands and expertise providing integrated solutions that will save valuable time on your project schedule!

Gautschi Engineering GmbH

Booth #327

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
- AIR GLIDE® and AIRSOL VEIL® mould technology

Gillespie + Powers, Inc.

Booth #428

Gillespie & Powers, Inc. would like to thank our customers for their continued loyal support and invite new customers to experience the service and creative problem solving that exemplifies our company. Having over 75 years of experience with hundreds of projects to draw from, we offer creative solutions that provide the ultimate in operational throughput. Gillespie & Powers is engaged in the engineering, design, supply, installation, and maintenance of industrial furnaces and refractory systems. We have specific history in the aluminum market with Delacquering, Melting, and Holding furnaces. We can also help fix your areas of opportunity within your process because of our unique experience by providing Root Cause Analysis: Engineering Services, Modifications and Thermal Imaging of your existing equipment.

Let us help you think outside the box and provide a solution you won't find anywhere else in the industry.

GILLESPIE & POWERS, INC.

“AMERICAN OWNED – GLOBALLY KNOWN”

GLAMA Maschinenbau GmbH

Booth #331

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 - Tapping Trucks

GLAMA's experience of many years of 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 #437

GNA alutech inc. specializes in designing furnaces, machinery and process control systems for the aluminium industries.

Our focus is Cathode Sealing Equipment for modern smelters and a variety of casthouse furnaces and heat treatment furnaces for primary and secondary producers. The results are major orders executed around the world.

GNA technology and equipment is in production at several major Clients including Rio Tinto Alcan, Alcoa, Alouette, Norsk Hydro, Kaiser, Alba, Sohar, MA'ADEN, THT, OARC and others.

With a strategic location in China and sales representation in Brazil and a highly qualified combined staff, GNA is well-poised to meet today's Global market needs

Goodfellow Corporation

Booth #101

Goodfellow supplies small quantities of metals, alloys, ceramics and polymers to meet the research, development and specialist product requirements of 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 ready for immediate shipment worldwide with no extra shipping charge. Custom made items are available to special order.



Mark Your Calendars

Make plans now to join TMS at the following events in 2014-2015

TMS

OTC Asia

March 25-28, 2014 • Kuala Lumpur, Malaysia

The inaugural Offshore Technology Conference (OTC) Asia, organized by 13 sponsoring societies, will bring industry professionals to Asia's oil and gas hub to meet, share knowledge, and discover cutting-edge technologies.

OTC 2014

May 5-8, 2014 • Houston, Texas

The Offshore Technology Conference (OTC) is the world's foremost event for the development of offshore resources in the fields of drilling, exploration, production, and environmental protection.

Hydrometallurgy 2014

June 22-25, 2014 • Victoria, BC, Canada

Hydrometallurgy 2014 will provide a forum for the dissemination of all research relating to hydrometallurgical extraction, purification, and recovery of base and precious metals.

2nd International Congress on 3D Materials Science 2014

June 29 – July 2, 2014 • Annecy, France

The International Congress on 3D Materials Science seeks to provide the premier forum for presentations of current interest and significance to the three dimensional characterization, visualization, quantitative analysis, modeling, and investigation of structure-property relationships of materials.

ABM-TMS Second Pan American Materials Conference - 2014

July 21-25, 2014 • Sao Paulo, Brazil

ABM will host this second installment of the Congress in 2014 during the 69th Annual meeting of ABM, at the 70th anniversary of the organization's founding.

The First TMS Summit on Creating and Sustaining Diversity in the Minerals, Metals, and Materials Professions (DMMM1): Honoring the First Female Member of AIME: Ellen Swallow Richards

July 29–31, 2014 • Washington, DC

Abundant research demonstrates that a diverse talent pool increases productivity, competitiveness, and creativity – but this diversity is often untapped relative to professionals in the minerals, metals, and materials communities. To address the issue, TMS is organizing this inaugural two-and-one-half day summit in 2014.

8th International Symposium on Superalloy 718 and Derivatives

September 28-October 1, 2014 • Pittsburgh, Pennsylvania

The 8th International Symposium on Superalloy 718 and Derivatives will cover all aspects of metallurgical processing, materials behavior, and microstructural performance for a distinct class of 718 type superalloys and derivatives.

MS&T'14

October 12-16, 2014 • Pittsburgh, Pennsylvania

The MS&T (Materials Science & Technology) partnership of leading materials societies brings together scientists, engineers, students, policy makers, suppliers and more to discuss current research and technical applications, and to shape the future of materials science and technology.

Energy Materials 2014

November 4-6, 2014 • Xi'an, Shaanxi Province, China

Energy Materials 2014 will provide a forum for academics, researchers, and engineers around the world to exchange state-of-the-art development and information on issues related to energy materials.

MEMA 2015

January 11-14, 2015 • Doha, Qatar

The goal of the TMS Middle East - Mediterranean Materials Congress on Energy and Infrastructure Systems is to build synergy among researchers working on different materials applications but with similar objectives of enhancing design, sustainability, and functionality of materials.

TMS 2015 Annual Meeting & Exhibition

March 15-19, 2015 • Orlando, Florida

TMS2015 will bring together more than 4,000 business leaders, engineers, scientists and other professionals in the materials field for an outstanding exchange of technical knowledge leading to solutions in the workplace and in society.



**Follow the @TMSociety
Twitter account to stay current
on all meetings' updates**

**For more information on any of these events,
visit www.tms.org/meetings.**



COMPANY DESCRIPTIONS

Gouda Refractories

Booth #411

Gouda Refractories is an innovative refractory producer (refractory bricks, castables, mortar, self-flowing castables, complex pre-cast shapes) with global experience and a long track record of supplying superior quality refractories all over the world, combined with innovative installation technology for more than 100 years.

Gouda Refractories develops, manufactures, sells and installs 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 co-operation with its customers and renowned research institutes. Gouda's quality assurance is based on the international ISO 9001 standard.

Granta Design

Booth #114

Granta will be attending the TMS Annual Meeting & Exhibition participating in discussions on international leadership for the advancement of engineering education, research, and service to the global community. Granta's education division provides resources and support to anyone teaching materials or related topics across the full range of disciplines in engineering science and design. Granta also helps to organize the Materials Education Symposia, global events which draw together those involved in materials education.

Hencon BV

Booth #322

Hencon, your global partner next-door. Hencon provides a complete range of heavy duty vehicles and vacuum technology solutions for primary and secondary aluminum smelters, mining applications and other process related industries. With locations in the Netherlands, Russia, India, South Africa and Mozambique and representations worldwide, we are able to give valuable training and maintenance support on site. Feel free to contact us for your challenges!

Heraeus Electro-Nite

Booth #309

Hycast AS

Booth #133

Hycast was established in 1990 by Hydro Aluminium as a spin off from Hydro R&D. Hycast provides One Stop Shop for complete casthouse solutions for competitive processes and quality end-products. Hycast supports customers to constantly achieve better quality at lower operation cost and thereby increases the competitiveness of its customers.

Hysitron

Booth #326

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.

ICE Publishing

Booth #526

ICE Science is the innovative new 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 being granted a Royal Charter in 1828. 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, with new journals appearing annually: Bioinspired, Biomimetic and Nanobiomaterials; Emerging Materials Research; Green Materials; Nanomaterials and Energy; and Surface Innovations. For further information, visit www.icevirtuallibrary.com/science.

Innovatherm GmbH + Co., KG

Booth #115

Innovatherm is the competent partner and the world market leader in anode baking technology. As a subsidiary of the LINGL Company, innovatherm operates in the aluminium industry, providing full service in combustion technology for reconstruction, fine tuning and optimization of existing anode baking furnaces as well as new furnaces including dry adsorption fume treatment plants.

For this purpose, Innovatherm has developed excellent process technologies and concepts with mathematical models, special components for the combustion like burners and gas valves, and future oriented control philosophies for optimal process management as well. For best results these concepts are custom-tailored to maximize plant safety, efficiency and economics.

Latest products established in the market are:

- ProBake Advanced Firing Systems for anode baking furnaces
- ProClean Fume Treatment Plants for the aluminium industry
- ProCast Supervisory Control Systems for primary and secondary Casthouses incl. charging management, target alloy calculation and melting optimization

International ALUMINIUM Journal

Booth #105

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, distributed to the world. Articles that are of global interest are published in English or bilingual (German and English).

IOP Publishing

Booth #530

IOP Publishing provides a range of journals, magazines, websites and services that enable researchers and research organizations to reach the widest possible audience for their research.

We combine the culture of a learned society with global reach and highly efficient and effective publishing systems and processes. With offices in the UK, US, Germany, China and Japan, and staff in many other locations including Mexico and Russia, we serve researchers in the physical and related sciences in all parts of the world.

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IPS Ceramics LTD

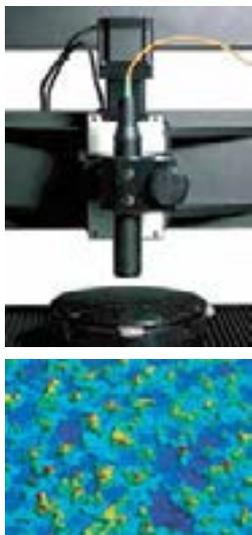
Booth #432

IPS is a first-time exhibitor here, showing an extensive selection of high purity alumina, machinable blocks for composites moulds and silicon carbide components designed for strong performance in tough environments. Tiles, discs, trays, crucibles, tubes, rods, spheres, insulators, seals, threaded parts, bulb holders, wire guides, plates, rings and much more. 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

NANOVEA®

A Better Measure.

Profilometers | Mechanical Testers | Tribometers | Lab Services



N Today's Standard For Tomorrow's Materials.

nanovea.com



COMPANY DESCRIPTIONS

KAN-NAK SA

KAN-NAK SA is a company dedicated to the mathematical modelling of aluminium reduction cells, with a strong intent on cell optimization in current increase projects. Based in Sierre, Switzerland, KAN-NAK SA employees have been active over 30 years in the field of MHD and thermal modelling.

AMC-ETEC SA is a company specialized in the energetic optimization of electro-intensive circuits and developed the metal foam ECOCONTACT, an innovative solution to energy losses in electric contacts. AMC-ETEC SA is based in Cannes La Bocca, France.

Kempe Engineering

Kempe is the largest provider of asset and maintenance services in the aluminium smelting industry. We have the most extensive product range within the industry and we are one of the top five global suppliers.

Kempe has recently completed the Anode Rodding Shop and Anode Handling System for Ma'aden Aluminium and we are currently commissioning the Bath Cooling & Processing Plant on the EMAL Phase 2 Expansion. We have also recently commissioned the Bath Treatment Plants for Hindalco's Mahan & Aditya Smelters.

Kempe works for 30 smelters across 7 regions – Australasia, Middle East, Africa, Asia, Europe, North America, and South America. We have in-house manufacturing in Australia, China, UAE & Mozambique.

Kempe has more than 1600 employees globally working in design, supply, manufacturing, construction and maintenance. Kempe will be available at TMS to discuss potential client requirements in the areas of Anode Handling & Cleaning, Rodding Shops, Bath Removal (hot & cold), Bath Cooling & Processing, and other Carbon, Potroom and Casthouse equipment.

Laeis

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 50-60 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.

Booth #109

Laser Distance Spectrometry

MAYA analyzes the elemental composition of materials directly on the conveyor belt without sampling, using cutting-edge LIBS (Laser-Induced Breakdown Spectroscopy) technology.

It can be applied at all stages of exploration, mining, beneficiation and processing of raw materials, providing real-time chemistry data. It can be easily integrated with any kind of automated control system (SCADA) for any sorting/separating/crushing/dosage equipment for prompt process control.

MAYA is currently implemented in metallurgy, refractory and fertilizers industries. We have also been successfully tested in non-ferrous, coal and cement industries. MAYA analyzer can be applied for process control in mining, beneficiation and processing of iron ores, coke, coal, limestone, etc.

Booth #440

Light Metal Age

Light Metal Age (LMA) is the pre-eminent magazine of the light metal world. LMA covers the technology of primary production and semi-fabrication of the light metals. Aluminum is the largest of the light metal markets and that is where LMA concentrates its attention, starting at the smelter and the entire primary production process and moving with the metal to include all semi-fabricating processes, such as extrusion, rolling, and also remelt. Basically, LMA covers the technology of aluminum processing. Circulation is international and goes to primary and secondary smelters; casthouses; extrusion operations; rolling mills; sheet, rod, and wire mills; and foundries. Some editorial topics include: potline technology, direct chill casting, secondary production, casthouse metal quality, furnaces and melting, filtration, extrusion and handling, automation and process control, surface technologies (such as anodizing), rolling mill technology, and markets for aluminum (such as automotive).

Booth #217

Laeis

Booth #409

LP Royer, Inc.

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 temperatures. 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 nonmagnetic toecaps. ROYER products meet CSA, ASTM and CE standards.

Booth #405

Maney Publishing

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

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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.

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Mecfor supplies fully adapted specialized mobile and stationary equipment for the toughest jobs found in the metal, rail and mining industries. Our experienced and creative team designs and builds innovative, sturdy and reliable equipment with your harsh working environment in mind. We study your operations, listen to your requests and adapt our products. We work with you to understand what you need; then we make it. Mecfor delivers on time and supports its products worldwide. Committed to productivity, reliability, and reusability, Mecfor aims to give you the best.

Melting Solutions

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Melting Solutions is a leading manufacturer of specialized process heating and Melting Equipment with over 30 years of experience offering customers a consultancy and manufacturing service for the upgrading, modification, repair of their plant with the supply of new equipment along with the overhaul of all makes and types of heating and melting equipment.

Melting Solutions has a team of engineers with unrivalled experience and knowledge covering a wide variety of equipment and has established an enviable reputation for its ability to design and custom build specialized aluminum melting recycling equipment for efficient processing of aluminum scrap.

Metallurgy and Materials Society of CIM

Booth #218

We are a world class Canadian organization that serves society and the needs of professionals in the global metallurgy and materials community. The purpose of MetSoc is to serve our members, society and others involved in the research, development and application of the science and technologies for the environmentally responsible extraction, fabrication, utilization and recycling of metals and materials.

Momentum Press

Booth #438

Momentum Press provides the very best information and knowledge on today's advancements in science, engineering, and applied technology. Our books in material science include such subjects as Transport Phenomena, X-Ray Fluorescence Spectrometry, and Modeling Solid-State Precipitation. All our books are written for practitioners, researchers, educational faculty, and students in print, ebooks, and in digital collections (on the ebrary platform). To learn more about our digital content collections, please visit www.momentumpress.net/library.

MTI Corp

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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 Corp

Booth #227

Engineers and researchers worldwide rely on MTS for the testing technology and expertise required to support the research, development and production of advanced metals, composites and ceramics. MTS provides solutions for aerospace, power generation, civil engineering and automotive industries. The MTS portfolio is engineered to address a full spectrum of materials testing requirements - from tension/compression to fracture mechanics to multi-axial fatigue studies at elevated temperatures.

NanoHub.org

Booth #436

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 (NSF) grant, has a growing user base of over 260,000 users annually. Explore our vast array of content on topics such as molecular dynamics, nanoelectronics, nanobio, and more. nanoHUB now features nanoHUB-U courses, 5 week modules across a variety of nano-related 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!



COMPANY DESCRIPTIONS

Nanovea

Booth #100

From the Irvine, CA office Nanovea designs and manufactures 3D Non Contact Profilometers, Mechanical Testers & Tribometers to combine the most advanced testing capabilities in the industry: Indentation Hardness, Scratch Adhesion, Wear Friction & 3D Non-Contact Metrology at Nano, Micro & 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

NBD Technology

Booth #341

MikroPul-Nederman

Booth #532

Nederman is the world's leading manufacturer of industrial air filtration equipment. We develop, produce and market systems for the extraction of dust, smoke, vehicle exhaust fumes as well as industrial cleaning. Nederman also produces and sells a comprehensive range of hose and cable reels. You can find information on our products at www.nederman.com or contact us at (800) 533-5286.

Netzsch Instruments NA LLC

Booth #222

Thermal analysis & 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 & cooling, new Concavus crucibles and unique sample-cutting tool. New instruments for Battery Calorimetry - introducing R&D 100 Award-winning IBC 284 Isothermal Battery Calorimeter for Large Format Li-Ion Batteries with 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. Also offering DMA, TMA, Dilatometers, and DEA (Dielectric Analyzer for in-situ cure monitoring). We will also feature the new LFA 467 HyperFlash Light Flash Analyzer for measurement of thermal diffusivity and thermal conductivity.

NFC - China Nonferrous Metal Industry

Booth #421

Founded in 1983, China Nonferrous Metal Industry's Foreign Engineering & Construction Co., Ltd. (NFC) is a state-owned holding company. It is listed on Shenzhen Stock Exchange since 1997. As a China leading enterprise engaged in general contracting of overseas nonferrous metal (aluminum, copper, zinc and etc.) projects and resources development, it covers a wide spectrum from technical assistance, engineering design, equipment manufacturing, construction, supervision, installation and training to mining, beneficiation, smelting, processing, etc. It has been listed on ENR as one of the top 225 international contractors and the top 200 international design firms for many years. With competitive edges in technology and rich experience in EPC contracting, NFC is capable and willing to work with world partners by providing a portfolio of services

including technologies, equipment supply and management.

NIST

Booth #433

NIST/Masurement Services Division NIST Standard Reference Materials supports accurate and compatible measurements by certifying and providing over 1300 Standard Reference Materials with well-characterized composition or properties, or both. SRMs are used to perform instrument calibrations as part of overall quality assurance programs, verify the accuracy of specific measurements and support the development of new measurement methods. The Standard Reference Data Group has provided well-documented numeric data to scientists and engineers for use in technical problem-solving, research, and development. The Calibration Services are designed to help the makers and users of precision instruments achieve high levels of measurement quality and productivity.

NKM Noell GmbH

Booth #414

NNSC has built a strong technical force based on specialists who individually have up to 25 years of experience in Primary Aluminium Industry for Potroom as well as for Carbon Area, as the only independent equipment supplier. For more than 40 years on the market through its constitutive companies, with more than 1,000 cranes in operation worldwide, NNSC is developing its mission for the Primary Aluminium Smelters and Nuclear plants: > To be a global supplier of handling systems, process equipment and solutions, > To integrate the client's process objectives in the design of the products through a continuous flow of mutual exchange.

North American Construction Services, Ltd. (NACS)

Booth #337

North American Construction services, Ltd. (NACS) offers an integrated array of products, combustion systems and process controls, installation and engineering services, and maintenance repair services. Our dedicated industry specialists work with our customers to assure best practices in addressing all metal processing needs. Our maintenance personnel provide help analyzing small repairs and provide refractory services, combustion tuning, electrical, mechanical and steel repair. In total, NACS is uniquely positioned to provide single source supply and continued life-cycle support for melting and holding furnaces, ovens, ladle and launder systems, furnace retrofits and refractory systems.

Olympus NDT

Booth #103

Portable Nondestructive XRF products from OLYMPUS NDT include handheld X-Ray Fluorescence (HHXRF) analyzers for non-destructive sorting of challenging grade separations, alloy chemistry and grade ID in seconds. They provide specific material chemistry to rapidly identify pure metals and alloy grades. HHXRFs allow for testing of literally thousands of types of materials anywhere, anytime. For scrap recycling applications, our HHXRFs provide reliable ID in 1-2 seconds for most grades. They are designed for durability – to withstand the tough processing environment. Our HHXRFs are used for



fast, reliable alloy sorting and analysis for a wide variety of ferrous and non-ferrous material. We provide optimized HHXRF configurations for cost-effective analysis when time is of the essence and when materials cannot be transported, damaged, or altered. Our X-5000 Mobile XRF analyzers offer maximum portable power with a closed beam configuration and large touch screen interface.

Outotec Ltd.

Booth #306

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

Booth #320

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.

P-D Refractories GmbH

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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. The know-how we acquired in the aluminium industry over decades and 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

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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.

Proto Manufacturing

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Residual stress affects crack initiation and propagation, fatigue life, stress corrosion cracking and distortion. For over 25 years, Proto Manufacturing has been providing both measurement services and equipment for measuring residual stress in metal components. Proto's leading edge x-ray diffraction (XRD) technology is portable, cost effective and provides the necessary data for making informed decisions about the health of components. Tel: 1-313-965-2900 E-Mail: proto@protoxrd.com Web: <http://www.protoxrd.com>

RHI AG

Booth #229

Refractory competence for the non-ferrous metals industry: RHI is the world's leading supplier of high-grade ceramic refractory products and services. As a reliable and competent partner it is our constant aim to add value to the process of our customers by achieving the best price/performance ratio with our refractory system solutions.

The comprehensive program of products and services ranges from basic and non-basic mixes and bricks to prefabricated products, slide gate plates, purging plugs, as well as computer simulations like CFD or FEM. We also offer special machines, repair systems and technical equipment used to install refractory products into the various production units of the non-ferrous metals industry. Our metallurgists are active around the globe and cooperate with renowned research facilities and universities to support the improvement of metallurgical processes and furnace integrity.

Riedhammer GmbH

Booth #419

The core competence of RIEDHAMMER is the design and construction of furnace plants for carbon products. The Carbon Division of RIEDHAMMER has executed more than 300 furnace projects since 1924 for the production of anodes, cathodes and electrodes in 25 countries. The furnaces are built in accordance with the individual customer's requests and the corresponding technical conditions. More than 85 years of experience and know-how guarantee a high economic efficiency and reliability of the plants.



COMPANY DESCRIPTIONS

Rio Tinto Alcan

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.

Sawnode Technologies

Sente Software Ltd.

We offer materials-focused software products for modeling the behavior and properties of complex alloys. The thermodynamic databases produced by Thermotech set the standard for the prediction of equilibrium and non-equilibrium structures in multi-component commercial alloys. Our latest product, JMat-Pro, is a unique software program for predicting phase transformations, physical/mechanical properties and solidification properties for complex alloys. It provides fast and robust calculations that have been extensively validated to ensure sound predictions of the properties. Our software combines industrial relevance with realistic physical models and user-friendly interfaces that work with "real" materials which are multi-component in nature and exhibit complex behavior. www.jmatpro.com.

Southwire SCR Technologies

Southwire's SCR Technologies provides equipment to the metals industry including continuous casting and rolling lines for aluminum and copper rod and narrow flat sections. Southwire also operates its own copper and aluminum casting lines where SCR Technologies has developed a patented ultrasonic aluminum degasser with substantial advantages over conventional degassing methods for the aluminum industry. Marketed under the brand name Ultra-D™ Degasser it efficiently removes hydrogen and inclusions including alkali metals without the use of corrosive chemicals. The Ultra-D™ Degasser can be easily integrated into die casting, foundry, continuous strip and billet casting facilities. The system consists of a degassing head, electrical controls, and an optional automatic feature which maintains consistent operation as the metal level fluctuates.

Booth #301

STAS

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 well-known agents in specific countries or geographical areas.

Sunstone

Sunstone is the largest anode exporter and one of the largest merchant anode manufacturers in China. It owns and operates two anode production facilities with an annual capacity of 520,000 metric tons. More than half of Sunstone's annual capacity is exported to more than 20 aluminium smelters all over the world. The company holds ISO 9001, ISO 14001 and OHSAS 18001 certifications. Other products and services supplied by Sunstone include anode paste, calcined pet-coke, cathodes, cold ramming paste, other lining materials and all kinds of equipment for aluminium smelters.

Techmo Car

Techmo is an Italian independent company focused in the engineering and production of special mobile and stationary equipment for the aluminium and non ferrous 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/ AlF3 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

Tenova Core, a multi-business unit Tenova company, based in Pittsburgh, Pa., 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. Tenova Core provides a wide range of heat treating, reheating and specialty furnaces as well as technical and spare parts services

Booth #131

Booth #401

Booth #121

Booth #316

Booth #110

Booth #204

Booth # 219



Thermo-Calc Software

Booth #427

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 enables Thermo-Calc to be called directly from in-house 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. TC-PRISMA: a new tool for predictions of concurrent nucleation, growth, dissolution and coarsening of precipitate phases.

Thorpe Technologies, Inc.

Booth #508

TMS Information Center

Booth #118

The TMS Information Center consolidates everything TMS in one convenient location. It is your destination to find how to get the most out of your TMS member benefits, learn about TMS's technical initiatives, be inspired by the work of the TMS Foundation, and discover new opportunities as a TMS volunteer.

UES, Inc.

Booth # 215

RoboMet.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 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. STOP BY BOOTH 215 TO SEE ROBO-MET.3D IN ACTION!



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TECHNICAL PROGRAM

**February 16-20, 2014 • San Diego Convention Center
San Diego, California, USA**

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PROGRAM AT-A-GLANCE

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2014 Aluminum Keynote Session

"Innovation in the Alumina and Primary Aluminum Industries: How Will We Move on to the Next S-curve?"	MON	8:30 AM	SDCC	6A	78
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2014 Functional Nanomaterials: Synthesis, Properties and Applications

Nanomanufacturing I	MON	8:30 AM	Marriott	Ballroom D	78
Nanomanufacturing II & Fabrication and Fundamentals I	MON	2:00 PM	Marriott	Ballroom D	96
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	252
Fabrication and Fundamentals II & Characterization and Properties I	TUE	8:30 AM	Marriott	Ballroom D	118
Characterization and Properties II & Carbon Nanomaterials I	TUE	2:00 PM	Marriott	Ballroom D	140
Carbon Nanomaterials II & Computational Studies on Nanomaterials	WED	8:30 AM	Marriott	Ballroom D	163
Magnetic Nanomaterials	WED	2:00 PM	Marriott	Ballroom D	185
Applications of Nanomaterials I	THU	8:30 AM	Marriott	Ballroom D	208
Applications of Nanomaterials II & Energy Nanomaterials	THU	2:00 PM	Marriott	Ballroom D	232

2014 Materials and Manufacturing Innovation

World Views on Materials and Manufacturing Innovation: Regional Perspectives from Government Organizations	TUE	8:30 AM	SDCC	6A	118
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2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications

Keynote Session on Nanomaterials, General Properties and Others	MON	8:30 AM	Marriott	Ballroom E	78
Keynote Session on Nanomaterials and Applications	MON	2:00 PM	Marriott	Ballroom E	97
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	252
Nanoceramics I--Nanostructured Ceramics-oxides and Thin Film Interfaces	TUE	8:30 AM	Marriott	Ballroom E	119
Nanometals I-Twinning and Interfacial Effects for Application	TUE	2:00 PM	Marriott	Ballroom E	141
Nanometals II-Processing and Strengthening Mechanisms	WED	8:30 AM	Marriott	Ballroom E	163
Nanomaterials for Device Applications and Nanometal III-Deformation Mechanisms	WED	2:00 PM	Marriott	Ballroom E	186
Nanomaterials for Energy Applications and Carbon Related Materials	THU	8:30 AM	Marriott	Ballroom E	208

5th International Symposium on High Temperature Metallurgical Processing

High Efficiency New Metallurgical Technology	MON	8:30 AM	SDCC	18	79
Alloy and Materials Preparation	MON	2:00 PM	SDCC	18	97
Fundamental Research of Metallurgical Process	TUE	8:30 AM	SDCC	18	119



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Roasting, Reduction and Smelting	TUE	2:00 PM	SDCC	18	141
Sintering of Ores and Powder	WED	8:30 AM	SDCC	18	164
Simulation and Modeling	WED	2:00 PM	SDCC	18	186
Treatment of Solid Slag/Wastes and Complex Ores	THU	8:30 AM	SDCC	18	209
Microwave Heating, Energy and Environment	THU	2:00 PM	SDCC	18	232

**“A Lifetime of Experience with Titanium Alloys:
An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer”**

Williams Honorary Session I: Processing Science	MON	8:30 AM	SDCC	1A	79
Williams Honorary Session II: Fatigue I	MON	2:00 PM	SDCC	1A	98
Loretto Honorary Session I: Phase Stability	TUE	8:30 AM	SDCC	1A	120
Loretto Honorary Session II: Fatigue II & Advanced Fabrication	TUE	2:00 PM	SDCC	1A	142
Boyer Honorary Session I: Environmental Effects	WED	8:30 AM	SDCC	1A	164
Boyer Honorary Session II: Structure/Property Correlations	WED	2:00 PM	SDCC	1A	187
General Abstracts	THU	8:30 AM	SDCC	1A	209

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling

Ion Beam Irradiation	MON	8:30 AM	SDCC	33B	80
Ion Beam Irradiation and Advanced Characterization Techniques	MON	2:00 PM	SDCC	33B	98
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	253
Simulation and Modeling	TUE	8:30 AM	SDCC	33B	120
In-situ TEM and Materials Testing Environmental Interactions and Programmatic Aspects	TUE	2:00 PM	SDCC	33B	142
Irradiation Studies in Reactors	WED	8:30 AM	SDCC	32B	165
Fuels	WED	2:00 PM	SDCC	33C	187

**Advanced Characterization Techniques
for Quantifying and Modeling Deformation Mechanisms**

Characterization of Strain	MON	8:30 AM	SDCC	8	80
Dislocations and Plasticity	MON	2:00 PM	SDCC	8	99
Poster Session	MON	6:30 PM	SDCC	8	254
Strain and Plasticity	TUE	8:30 AM	SDCC	8	121
Advanced Materials and HCP Metals	TUE	2:00 PM	SDCC	8	143
Strain and Plasticity II	WED	8:30 AM	SDCC	8	165

Advanced Composites for Aerospace, Marine, and Land Applications

Processing and Design of Composites	MON	8:30 AM	SDCC	6F	81
Characterization of Composite Microstructures and Phases	MON	2:00 PM	SDCC	6F	99
Mechanical and Material Property Evaluation	TUE	8:30 AM	SDCC	6F	121
Interface and Bonding of Composite Systems	TUE	2:00 PM	SDCC	6F	143





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Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion II

Advanced Materials for Power Electronics, Power Conversion, and Power Conditioning	MON	8:30 AM	Marriott	Cardiff	81
Capacitor and Dielectric Materials	MON	2:00 PM	Marriott	Cardiff	100
Wide Bandgap Semiconductors Materials Growth and Characterization	TUE	8:30 AM	Marriott	Cardiff	122
Wide Bandgap Semiconductors Device Processing and Characterization	TUE	2:00 PM	Marriott	Cardiff	144
High Performance Soft Magnets I (This is a joint session with Magnetic Materials for Energy Applications IV)	WED	2:00 PM	Marriott	Cardiff	188
High Performance Soft Magnets II (This is a joint session with Magnetic Materials for Energy Applications IV)	THU	8:30 AM	Marriott	Cardiff	210

Advanced Materials in Dental and Orthopedic Applications

Next Generation Biomaterials for Prosthodontics and Orthopedics	MON	2:00 PM	SDCC	32B	100
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	254
Physical and Mechanical Properties of Orthopedic/Dental Materials	TUE	2:00 PM	SDCC	33A	144
Corrosion and Tribocorrosion Behavior of Orthopedic/Dental Materials	WED	2:00 PM	SDCC	32B	188
Bone/Dental Implants with Enhanced Biomedical Performance	THU	8:30 AM	SDCC	32B	210
Dental and Orthopedic Composites	THU	2:00 PM	SDCC	1A	233

Advances in Surface Engineering: Alloyed and Composite Coatings III

Mechanical, Wear, and Corrosion Properties of Coatings	MON	8:30 AM	SDCC	1B	81
Laser Processing, Thermal Spraying, and Friction Stir Processing of Coatings	MON	2:00 PM	SDCC	1B	101
High Temperature Coatings	TUE	8:30 AM	SDCC	1B	122
Electrochemical and Low Temperature Processing of Coatings	TUE	2:00 PM	SDCC	1B	144
Joint Session I: Recent Developments in Biological, Electronic, and Functional Thin Films and Coatings	WED	8:30 AM	SDCC	1B	166
Joint Session II: Recent Developments in Biological, Electronic, and Functional Thin Films and Coatings	WED	2:00 PM	SDCC	1B	189

Algorithm Development in Computational Materials Science and Engineering

Algorithms for Lower Length Scale Modeling: Ab Initio, Atomistics and Materials Chemistry: Part I	MON	8:30 AM	SDCC	31B	82
Algorithms for Lower Length Scale Modeling: Ab Initio, Atomistics and Materials Chemistry: Part II	MON	2:00 PM	SDCC	31B	101
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	255
Towards Higher Length Scales: Mesoscale Modeling and Scale Bridging: Part I	TUE	8:30 AM	SDCC	31B	123
Towards Higher Length Scales: Mesoscale Modeling and Scale Bridging: Part II	TUE	2:00 PM	SDCC	31B	145
Algorithms for General Materials Modeling and Integrating Experiments: Part I	WED	8:30 AM	SDCC	31B	166



	Day	Time	Building	Room	Page
Algorithms for General Materials Modeling and Integrating Experiments: Part II	WED	2:00 PM	SDCC	31B	189

Alloys and Compounds for Thermoelectric and Solar Cell Applications II

Alloys and Compounds for Thermoelectric and Solar Cell Applications: Thermoelectric I	WED	8:30 AM	Marriott	Cardiff	167
Alloys and Compounds for Thermoelectric and Solar Cell Applications: Thermoelectric II	WED	2:00 PM	Marriott	Cardiff	190
Alloys and Compounds for Thermoelectric and Solar Cell Applications: Thermoelectric III	THU	8:30 AM	Marriott	Cardiff	211

Alumina and Bauxite

Bayer Process/Quality	MON	2:00 PM	SDCC	15B	101
Process Control	TUE	8:30 AM	SDCC	15B	123
Cost Reduction/Alumina Recovery	TUE	2:00 PM	SDCC	15B	146
Non-bayer Process	WED	8:30 AM	SDCC	15B	167
Waste Recovery	WED	2:00 PM	SDCC	15B	190

Aluminum Alloys: Development, Characterization and Applications

Development and Application	MON	2:00 PM	SDCC	12	102
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	255
Processing, Texture and Formability	TUE	8:30 AM	SDCC	12	123
Solutioning and Aging Behaviors	TUE	2:00 PM	SDCC	12	146
Corrosion and Fatigue	WED	8:30 AM	SDCC	12	168
Material Characterization and Modeling	WED	2:00 PM	SDCC	12	191
Emerging Technologies	THU	8:30 AM	SDCC	12	211

Aluminum Processing

Aluminum Processing: Rolling & Twin-Roll Casting	MON	2:00 PM	SDCC	13	102
Aluminum Processing: Extrusion & Miscellaneous Processes	TUE	8:30 AM	SDCC	13	124

Aluminum Reduction Technology

Potline Operations - Cell Operations	MON	2:00 PM	SDCC	14A	103
Cell Design and Performance	MON	2:00 PM	SDCC	14B	103
Cell Design and Performance - Cathodes and Anodes Joint Session with Electrode Technology	TUE	8:30 AM	SDCC	14A	124
Environment I	TUE	2:00 PM	SDCC	13	146
Fundamentals - Chemistry	TUE	2:00 PM	SDCC	14A	147
Environment II	WED	8:30 AM	SDCC	13	168
Fundamentals - Modelling	WED	8:30 AM	SDCC	14A	168
Potline Operations- Equipment	WED	2:00 PM	SDCC	14A	192
Fundamentals - Electrochemistry and New Processes	WED	2:00 PM	SDCC	13	191
Potline Operations- Control	THU	2:00 PM	SDCC	14A	233

Biological Materials Science Symposium

Mechanical Behavior of Biological Materials I: Bone and Teeth (In Honor of Professor Robert O. Ritchie, the 2014 Acta Materialia Gold Medal Award Winner)	MON	8:30 AM	SDCC	33A	82
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PROGRAM AT-A-GLANCE

	Day	Time	Building	Room	Page
Mechanical Behavior of Biological Materials II: Natural Materials	MON	2:00 PM	SDCC	33A	103
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	256
Multi-scale Characterization and Modeling of Biological Materials (Joint session with Characterization of Minerals, Metals and Materials 2014 Symposium)	TUE	8:30 AM	SDCC	33A	125
Bio-mimetic and Bio-inspired Materials Synthesis	WED	8:30 AM	SDCC	33A	169
Multi-functional Surfaces and Interfaces (Joint session with Characterization of Minerals, Metals and Materials 2014 Symposium)	WED	2:00 PM	SDCC	33A	192
Molecular, Cellular and Tissue Engineering	THU	8:30 AM	SDCC	33A	212
Biomedical Materials, Implants and Applications	THU	2:00 PM	SDCC	33A	234

Bulk Metallic Glasses XI

Alloy Development and Applications I	MON	8:30 AM	SDCC	2	83
Structures and Mechanical Properties I	MON	2:00 PM	SDCC	2	104
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	256
Structures and Mechanical Properties II	TUE	8:30 AM	SDCC	2	125
Fatigue and Other Properties	TUE	2:00 PM	SDCC	2	147
Alloy Development and Applications II	WED	8:30 AM	SDCC	2	169
Simulation and Modeling	WED	2:00 PM	SDCC	2	192
Structures and Mechanical Properties III	THU	8:30 AM	SDCC	2	213
Structure and Modeling	THU	8:30 AM	SDCC	1B	212
Mechanical and other Properties	THU	2:00 PM	SDCC	2	234

Cast Shop for Aluminum Production

Macrosegregation and DC Casting	MON	2:00 PM	SDCC	15A	104
Recycling/Cast Shop	TUE	8:30 AM	SDCC	15A	126
Grain Refinement/Solidification	TUE	2:00 PM	SDCC	15A	148
Metal Treatment	WED	8:30 AM	SDCC	15A	169
Furnaces and Energy	WED	2:00 PM	SDCC	15A	193
General Cast Shop	THU	8:30 AM	SDCC	15A	213

“Celebrating the Megascale: An EPD Symposium in Honor of David G.C. Robertson”

Keynote Session	MON	8:30 AM	SDCC	16A	83
Ferro-Alloys	MON	2:00 PM	SDCC	16A	105
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	256
Non-Ferrous Smelting, Converting, and Refining	TUE	8:30 AM	SDCC	16A	126
Iron and Steel Production	TUE	2:00 PM	SDCC	16A	148
Process Modeling and Simulation	WED	8:30 AM	SDCC	16A	170
Metallurgical Education	WED	2:00 PM	SDCC	16A	193
Pyrometallurgy Process Fundamentals I	THU	8:30 AM	SDCC	16A	213



	Day	Time	Building	Room	Page
Pyrometallurgy Process Fundamentals II	THU	2:00 PM	SDCC	16A	235
Pyrometallurgy Process Fundamentals III	THU	2:00 PM	SDCC	13	235

Characterization of Minerals, Metals and Materials 2014

Characterization of Ceramics and Clays	MON	8:30 AM	SDCC	7A	84
Characterization of Composites	MON	2:00 PM	SDCC	7A	105
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	257
Characterization of Environmental Materials	TUE	8:30 AM	SDCC	7A	126
Characterization of Non Ferrous Metals	TUE	2:00 PM	SDCC	7A	149
Characterization of Ferrous Metals	WED	8:30 AM	SDCC	7A	171
Characterization of Material Processing	WED	2:00 PM	SDCC	7A	194
Characterization in Material Extraction	THU	8:30 AM	SDCC	7A	214
Characterization of Soft Materials I	THU	8:30 AM	SDCC	7B	214
Characterization of Minerals	THU	2:00 PM	SDCC	1B	235
Method Development in Characterization	THU	2:00 PM	SDCC	7A	236
Characterization of Soft Materials II	THU	2:00 PM	SDCC	7B	236

Computational Discovery of Novel Materials

Methodologies and Application for Materials Discovery	WED	2:00 PM	SDCC	31A	194
Physical Properties of New Materials	THU	8:30 AM	SDCC	31A	215
Optimization, Validation, and Application of Empirical Potentials	THU	2:00 PM	SDCC	31A	237

Computational Modeling and Simulation of Advanced Materials for Energy Applications

Starting from Quantum Mechanics	MON	8:30 AM	Marriott	Mission Hills	84
Quantum to Atomistic Simulations	MON	2:00 PM	Marriott	Mission Hills	105
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	258
MGI, ICME and Education (This is a joint session with Energy Technologies and Carbon Dioxide Management Symposium)	TUE	8:30 AM	Marriott	Mission Hills	127
Continuum Modeling and Beyond	TUE	2:00 PM	Marriott	Mission Hills	149

Computational Thermodynamics and Kinetics

In Honor of Dr. Mark Asta, EMPMD Outstanding Scientist: Session I	MON	8:30 AM	SDCC	30D	85
In Honor of Dr. Mark Asta, EMPMD Outstanding Scientist: Session II	MON	2:00 PM	SDCC	30D	106
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	258
Thermodynamics and Kinetics	TUE	8:30 AM	SDCC	30D	127
First-principles Calculations	TUE	2:00 PM	SDCC	30D	150
Phase-field Simulations	WED	8:30 AM	SDCC	30D	171
Phase-field Simulations/Molecular Dynamics	WED	2:00 PM	SDCC	30D	194
Plasticity/Alloy/Grain Growth/Grain Boundary Properties	THU	8:30 AM	SDCC	30D	215





PROGRAM AT-A-GLANCE

	Day	Time	Building	Room	Page
Battery/Oxides/Steel/Alloy	THU	2:00 PM	SDCC	30D	237

Data Analytics for Materials Science and Manufacturing

The Business of Data Analytics	MON	8:30 AM	SDCC	15B	85
Emerging Big Data Opportunities in Materials Science	TUE	8:30 AM	SDCC	32B	128
Inverse and Forward Modeling	TUE	2:00 PM	SDCC	32B	150
Inverse Methods II: Reduced Order Modeling	WED	2:00 PM	SDCC	30E	195
Topology, Graph Theory, and Data Fusion	THU	8:30 AM	SDCC	30E	216
Microstructure Quantification	THU	2:00 PM	SDCC	30E	237

Deformation, Damage, and Fracture of Light Metals and Alloys III

Al Alloys	MON	2:00 PM	SDCC	19	106
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	259
Mg Alloys	TUE	8:30 AM	SDCC	19	128
Al-Mg and Other Alloys	TUE	2:00 PM	SDCC	19	150
Modelings	WED	8:30 AM	SDCC	19	172
Ti Alloys	WED	2:00 PM	SDCC	19	195

“Dynamic Behavior of Materials VI - An SMD Symposium in Honor of Professor Marc Meyers”

Shock-Compression of Materials	MON	8:30 AM	SDCC	3	85
High-Strain-Rate Effects in Heterogeneous Materials	MON	2:00 PM	SDCC	3	107
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	259
Simulations and Modeling of Phase Transformations and Reactions	TUE	8:30 AM	SDCC	3	128
High Strain Rate Effects on Shear Localization	TUE	2:00 PM	SDCC	3	151
Shock-Induced Deformation and Failure	WED	8:30 AM	SDCC	3	172
High-Strain-Rate Deformation Mechanisms	WED	2:00 PM	SDCC	3	196
Heterogeneous and Brittle Materials	THU	8:30 AM	SDCC	3	216
Mechanical Properties	THU	2:00 PM	SDCC	3	238

Electrode Technology for Aluminium Production

Anode Raw Materials	MON	4:00 PM	SDCC	14B	107
Paste Plant Operations	TUE	8:30 AM	SDCC	14B	129
Bake Furnace Design and Operation	TUE	2:00 PM	SDCC	14B	151
Anode Quality and Performance	WED	8:30 AM	SDCC	14B	172
Cathode Materials and Wear	WED	2:00 PM	SDCC	14B	196
Rodding Operation and Anode Electrical Connections	THU	8:30 AM	SDCC	14B	217
Inert Anodes, Cathode Design and Alternative Processes	THU	2:00 PM	SDCC	14B	238

EMPMD 2014 Technical Division Student Poster Contest

Poster Judging	MON	3:30 PM	SDCC	Sails Pavilion	259
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EMPMD 2014 Technical Division Young Professional Poster Contest

Posters	MON	6:30 PM	SDCC	Sails Pavilion	260
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Day	Time	Building	Room	Page
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Energy Technologies and Carbon Dioxide Management

Alternative Green Processes	MON	8:30 AM	Marriott	Balboa	86
Energy in Iron and Steel	MON	2:00 PM	Marriott	Balboa	107
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	260
MGI, ICME and Education (This is a joint session with the Computational Modeling and Simulation of Advanced Materials for Energy Applications symposium)	TUE	8:30 AM	Marriott	Mission Hills	130
Carbon Dioxide Management	TUE	8:30 AM	Marriott	Balboa	129
Novel Technologies and Life Cycle Assessment	TUE	2:00 PM	Marriott	Balboa	151
Energy Efficiency and Furnace Technologies	WED	8:30 AM	Marriott	Balboa	173

EPD 2014 Technical Division Student Poster Contest

Poster Judging	MON	3:30 PM	SDCC	Sails Pavilion	260
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EPD 2014 Technical Division Young Professional Poster Contest

Posters	MON	6:30 PM	SDCC	Sails Pavilion	260
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Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention

Emerging Technologies for Data-driven Fatigue Descriptions	MON	8:30 AM	SDCC	7B	86
Microstructure-sensitive and Multiscale Modeling of Fatigue	MON	2:00 PM	SDCC	7B	108
Microstructure-properties-fatigue Relationships	TUE	8:30 AM	SDCC	7B	130
Characterization and Modeling of Fatigue Crack Initiation and Growth	TUE	2:00 PM	SDCC	7B	152
Fatigue Investigations of Novel Materials	WED	8:30 AM	SDCC	7B	173
Design Against Fatigue and Fatigue Property Enhancement	WED	2:00 PM	SDCC	7B	196
Environmental-temperature Effects on Fatigue and Life Prediction	THU	2:00 PM	SDCC	10	239

Fluidization Technologies for the Mineral, Materials, and Energy Industries

Fluidization Technologies for the Mineral, Materials, and Energy Industries	MON	8:30 AM	SDCC	17B	87
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Gamma TiAl Alloys 2014

Session I	MON	8:30 AM	SDCC	6B	87
Session II	MON	2:00 PM	SDCC	6B	108
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	261
Session III	TUE	8:30 AM	SDCC	6B	130
Session IV	TUE	2:00 PM	SDCC	6B	152
Session V	WED	8:30 AM	SDCC	6B	174
Session VI	WED	2:00 PM	SDCC	6B	197
Session VII	THU	8:30 AM	SDCC	6B	217
Session VIII - Panel Discussion	THU	2:00 PM	SDCC	6B	239

General Recycling

General Recycling Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	261
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PROGRAM AT-A-GLANCE

Day	Time	Building	Room	Page
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High-temperature Gamma (f.c.c.) /Gamma-Prime (L12 structure) Co-Al-W Based Superalloys

Diffusion Behavior and Phase Equilibria	MON	8:30 AM	SDCC	5A	87
Oxidation and Alloying Effects on Mechanical Behavior	MON	2:00 PM	SDCC	5A	108
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	262
Processing, Deformation and Interfaces	TUE	8:30 AM	SDCC	5A	131
Defects and Microstructural Evolution	TUE	2:00 PM	SDCC	5A	153

High-temperature Material Systems for Energy Conversion and Storage

High Temperature Separation Membranes & Energy Conversion Materials	MON	8:30 AM	Marriott	Carlsbad	88
Solid Oxide Fuel Cells I	MON	2:00 PM	Marriott	Carlsbad	109
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	262
Solid Oxide Fuel Cells II	TUE	8:30 AM	Marriott	Carlsbad	131

“Hume-Rothery Award Symposium: Thermodynamics and Kinetics of Engineering Materials”

Thermodynamic Modeling and Phase Diagrams	MON	8:30 AM	SDCC	6C	88
Thermodynamic and Kinetic Modeling and Experiments	MON	2:00 PM	SDCC	6C	109
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	262
Light Alloy Systems	TUE	8:30 AM	SDCC	6C	132
Iron-base Systems	TUE	2:00 PM	SDCC	6C	153
Materials Systems for Energy	WED	8:30 AM	SDCC	6C	174

ICME: Linking Microstructure to Structural Design Requirements

ICME: Linking Microstructure to Structural Design Requirements I	MON	8:30 AM	SDCC	31A	89
ICME: Linking Microstructure to Structural Design Requirements II	MON	2:00 PM	SDCC	31A	110
ICME: Linking Microstructure to Structural Design Requirements III	TUE	8:30 AM	SDCC	31A	132
ICME: Linking Microstructure to Structural Design Requirements IV	TUE	2:00 PM	SDCC	31A	153
ICME: Linking Microstructure to Structural Design Requirements- V	WED	8:30 AM	SDCC	31A	175

Integration of Materials Science and Nondestructive Evaluation for Materials Characterization

Quantitative Nondestructive Characterization I	WED	2:00 PM	SDCC	8	197
Quantitative Nondestructive Characterization II: Titanium Alloys	THU	8:30 AM	SDCC	8	218
Quantitative Nondestructive Characterization III	THU	2:00 PM	SDCC	8	239

Length Scaling of Lamellar and Patterned Microstructures During Solid-Solid Phase Transformations and Solidification

Nucleation and Crystallographic Effects	MON	8:30 AM	SDCC	32A	89
Dendrites	TUE	8:30 AM	SDCC	32A	132
Eutectics	WED	8:30 AM	SDCC	32A	175



	Day	Time	Building	Room	Page
Growth Kinetics and Precipitate Morphology	THU	8:30 AM	SDCC	32A	218

Light-metal Matrix (Nano)-composites

Microstructure-Property Relationships I	MON	2:00 PM	SDCC	17B	110
Microstructure-Property Relationships II: Modeling and Advanced Characterization	TUE	8:30 AM	SDCC	17B	133
Emerging Processes	TUE	2:00 PM	SDCC	17B	154
In-situ Synthesis and Novel Additions	WED	2:00 PM	SDCC	16B	198

LMD 2014 Technical Division Student Poster Contest

Poster Judging	MON	3:30 PM	SDCC	Sails Pavilion	262
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LMD 2014 Technical Division Young Professional Poster Contest

Posters	MON	6:30 PM	SDCC	Sails Pavilion	263
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Long-term Stability of High Temperature Materials

Phase Changes in Bulk Material	MON	8:30 AM	SDCC	4	89
Phase Changes in Bulk Material II and Surface Degradation	MON	2:00 PM	SDCC	4	110
Surface Degradation II and Exposure Effects on Mechanical Behavior	TUE	8:30 AM	SDCC	4	133

Magnesium Technology 2014

Keynote Session	MON	8:30 AM	SDCC	17A	90
Powders, Recycling, Hydrometallurgy, Primary Production, and Creep	MON	2:00 PM	SDCC	17A	111
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	263
Deformation I	TUE	8:30 AM	SDCC	17A	134
Deformation II	TUE	2:00 PM	SDCC	17A	154
Melting, Modelling, and Solidification	WED	8:30 AM	SDCC	17A	175
Texture and Wrought Processing I	WED	2:00 PM	SDCC	17A	198
Corrosion and Coatings	THU	8:30 AM	SDCC	19	219
Wrought Processing II and Joining	THU	8:30 AM	SDCC	17A	219
Biomedical Applications	THU	2:00 PM	SDCC	19	240
Alloy Design	THU	2:00 PM	SDCC	17A	240

Magnetic Materials for Energy Applications IV

Rare Earth Permanent Magnets: Processing, Characterization and Modeling	MON	2:00 PM	Marriott	Ballroom G	111
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	264
Rare Earth Free Permanent Magnets	TUE	8:30 AM	Marriott	Ballroom G	134
Fundamentals of the Magnetocaloric Effect and Current Status of Magnetic Cooling Technology	TUE	2:00 PM	Marriott	Ballroom G	155
Magnetocaloric Materials	WED	8:30 AM	Marriott	Ballroom G	176





PROGRAM AT-A-GLANCE

	Day	Time	Building	Room	Page
High Performance Soft Magnets I (This is a joint session with Advanced Materials for Power Electronics, Power Conditioning and Power Conversion II)	WED	2:00 PM	Marriott	Ballroom G	198
High Performance Soft Magnets II (This is a joint session with Advanced Materials for Power Electronics, Power Conditioning and Power Conversion II)	THU	8:30 AM	Marriott	Ballroom G	220

Materials and Fuels for the Current and Advanced Nuclear Reactors III

Fuels I	MON	8:30 AM	SDCC	33C	90
Fuels II	MON	2:00 PM	SDCC	33C	112
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	264
Structural Materials I	TUE	8:30 AM	SDCC	33C	135
Structural Materials II	TUE	2:00 PM	SDCC	33C	155
Structural Materials III	WED	8:30 AM	SDCC	33C	176
Structural Materials IV	THU	8:30 AM	SDCC	33C	220
Modeling	THU	2:00 PM	SDCC	33C	241
General	THU	2:00 PM	SDCC	32B	240

Materials Aspects of Corrosion and Fouling in Oil Refining and Exploration

Session I	WED	8:30 AM	Marriott	Mission Hills	177
Session II	WED	2:00 PM	Marriott	Mission Hills	199
Session III	THU	8:30 AM	Marriott	Mission Hills	221

Materials for High-temperature Applications: Next Generation Superalloys and Beyond

Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	265
Next Generation High-Temperature Materials	TUE	8:30 AM	SDCC	6D	135
Nb- and Ni-Based Alloys	TUE	2:00 PM	SDCC	6D	156
Mo- and Ni-Based Alloys	WED	8:30 AM	SDCC	6D	177
Superalloys	WED	2:00 PM	SDCC	6D	199
Oxidation and Coatings	THU	8:30 AM	SDCC	6D	221
Emerging Materials	THU	2:00 PM	SDCC	6D	241

Materials Processing Fundamentals

Thermodynamic	MON	8:30 AM	SDCC	11B	91
Process & Properties Control	MON	2:00 PM	SDCC	11B	112
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	265
Metal Extraction	TUE	8:30 AM	SDCC	11B	135
TWIP/Steelmaking	TUE	2:00 PM	SDCC	11B	156

Mechanical Behavior at the Nanoscale II

In Situ Nanomechanical Testing	MON	8:30 AM	SDCC	9	91
Nanostructured Materials	MON	2:00 PM	SDCC	9	113



	Day	Time	Building	Room	Page
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	266
Size and Rate Effects	TUE	8:30 AM	SDCC	9	136
Multiscale Modeling	TUE	2:00 PM	SDCC	9	157
Nanostructured Composites and Glasses	WED	8:30 AM	SDCC	9	178
Micro/Nano-crystalline Materials	WED	2:00 PM	SDCC	9	200
Fatigue and Nanoindentation	THU	8:30 AM	SDCC	9	222
Length Scale Effects	THU	2:00 PM	SDCC	9	242

Mechanical Behavior Related to Interface Physics II

Interfacial Effects on Fracture and In situ Straining	MON	2:00 PM	SDCC	11A	113
Interfacial Effects on Radiation Tolerance and Chemical Stability	TUE	2:00 PM	SDCC	11A	157
Twinning Effects on Mechanical Deformation	WED	8:30 AM	SDCC	11A	178
Grain Boundary Effects on Mechanical Deformation	WED	2:00 PM	SDCC	11A	200
Biphase Boundary Effects on Mechanical Response of Composites I	THU	8:30 AM	SDCC	11A	222
Biphase Boundary Effects on Mechanical Response of Composites II	THU	2:00 PM	SDCC	11A	242
Biphase Boundary Effects on Mechanical Response of Composites III	THU	2:00 PM	SDCC	12	243

MPMD 2014 Technical Division Student Poster Contest

Poster Judging	MON	3:30 PM	SDCC	Sails Pavilion	267
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MPMD 2014 Technical Division Young Professional Poster Contest

Posters	MON	6:30 PM	SDCC	Sails Pavilion	268
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Multiscale Approaches to Hydrogen-assisted Degradation of Metals

Overview of Key Issues & Research Directions	MON	8:30 AM	SDCC	11A	91
Experimental Characterisation of H-assisted Damage	TUE	8:30 AM	SDCC	11A	136
Atomistic Modelling of H-microstructure Interactions	WED	8:30 AM	SDCC	11B	179
Meso & Macro-scale Modelling of H-microstructure Interactions	WED	2:00 PM	SDCC	11B	200
Overcoming HE in Service I / H Diffusion & Trapping	THU	8:30 AM	SDCC	11B	223
Overcoming HE in Service II	THU	2:00 PM	SDCC	11B	243

Multiscale Perspectives on Plasticity in HCP Metals

Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	268
Mechanisms & Microstructures I	WED	2:00 PM	SDCC	6C	201
Mechanisms & Microstructures II	THU	8:30 AM	SDCC	6C	223
Multiscale Modeling	THU	2:00 PM	SDCC	6C	244

Nanoparticulate Materials: Production, Consolidation and Characterization

Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	268
Consolidation I: Field Assisted Sintering	TUE	2:00 PM	Marriott	Carlsbad	158





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	Day	Time	Building	Room	Page
Consolidation II: Field Assisted Sintering	WED	8:30 AM	Marriott	Carlsbad	179
Consolidation III: Novel Consolidation Techniques	WED	2:00 PM	Marriott	Carlsbad	201
Particle Synthesis	THU	8:30 AM	Marriott	Carlsbad	224
Novel Synthesis, Processing and Characterization	THU	2:00 PM	Marriott	Carlsbad	244

Nanostructured Materials for Rechargeable Batteries and Supercapacitors II

Session I	MON	8:30 AM	Marriott	Ballroom F	92
Session II	MON	2:00 PM	Marriott	Ballroom F	114
Session III	TUE	8:30 AM	Marriott	Ballroom F	137
Session IV	TUE	2:00 PM	Marriott	Ballroom F	158
Session V	WED	8:30 AM	Marriott	Ballroom F	179
Session VI	WED	2:00 PM	Marriott	Ballroom F	202
Session VII	THU	8:30 AM	Marriott	Ballroom F	224
Session VIII	THU	2:00 PM	Marriott	Ballroom F	244

Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World

Diffraction Centennial - Historic Perspective and Future Challenges	MON	8:30 AM	SDCC	10	92
Complex Materials	MON	2:00 PM	SDCC	10	114
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	268
Advanced Structural Mapping	TUE	8:30 AM	SDCC	10	137
Stressed Materials	TUE	2:00 PM	SDCC	10	159
Multi-Modal Monitoring of Structure Evolution	WED	8:30 AM	SDCC	10	180
Static and Dynamic Displacements	WED	2:00 PM	SDCC	10	202
Plasticity and Deformation	THU	8:30 AM	SDCC	10	225

Pb-free Solders and Emerging Interconnect and Packaging Materials

High Temperature Environments	MON	8:30 AM	SDCC	5B	93
Alloying Additions	MON	2:00 PM	SDCC	5B	115
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	269
Issues in 3-D Packages	TUE	8:30 AM	SDCC	5B	138
Electromigration and Flexible Packages	TUE	2:00 PM	SDCC	5B	159
Characterization and Assessment	WED	8:30 AM	SDCC	5B	180
Interfacial Reactions and Fatigue	WED	2:00 PM	SDCC	5B	203
Whiskering and Substrate Effects	THU	8:30 AM	SDCC	5B	225
Microstructure Evolutions	THU	2:00 PM	SDCC	5B	245



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Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIII

Interfacial Reactions of the Pb-free Solder Joints	MON	8:30 AM	SDCC	32B	93
Phase Equilibria and Transformations of the Pb-free Solders and Energy Materials	MON	2:00 PM	SDCC	32A	115
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	269
Microelectronics Reliability I	TUE	2:00 PM	SDCC	32A	160
General Issues in Microelectronics and Energy Materials	WED	2:00 PM	SDCC	32A	203
Microelectronics Reliability II	THU	2:00 PM	SDCC	32A	246

Phase Transformation and Microstructural Evolution

Carbon Redistribution in Steels I	MON	8:30 AM	SDCC	31C	94
Fundamentals of Diffusion in Transformations in Steels	MON	2:00 PM	SDCC	31C	116
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	269
Carbon Redistribution in Steels II	TUE	8:30 AM	SDCC	31C	138
Multi-scale Modeling of Phase Transformations in Steels	TUE	2:00 PM	SDCC	31C	160
Alloying, Grain Refinement, and Microstructural Evolution in Steels	WED	8:30 AM	SDCC	31C	181
Processing and Microstructural Evolution I	WED	2:00 PM	SDCC	31C	204
Processing and Microstructural Evolution II	THU	8:30 AM	SDCC	31C	227
Martensitic Phase Transformations and Functional Materials	THU	8:30 AM	SDCC	13	226
Phase Transformations Induced by Irradiation I	THU	8:30 AM	SDCC	31B	226
Phase Transformations Induced by Irradiation II	THU	2:00 PM	SDCC	31B	246
Processing and Microstructural Evolution III	THU	2:00 PM	SDCC	31C	246

“Progress Towards Rational Materials Design in the Three Decades Since the Invention of the Embedded Atom Method: An MPMD Symposium in Honor of Dr. Michael I Baskes”

Recent Advances in Interatomic Potentials	MON	8:30 AM	SDCC	30E	94
Interatomic Potentials and Applications	MON	2:00 PM	SDCC	30E	116
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	270
Advances in Atomistic Simulations - I	TUE	8:30 AM	SDCC	30E	139
Advances in Atomistic Simulations - II	TUE	2:00 PM	SDCC	30E	161
Advances in Atomistic Simulations - III	WED	8:30 AM	SDCC	30E	181

Radiation Effects in Oxide Ceramics and Novel LWR Fuels

Experimental Characterization of Radiation Effects in Oxide Ceramics	WED	8:30 AM	SDCC	33B	182
Multi-scale Modeling of Radiation-induced Microstructure Evolution in Oxide Ceramics	WED	2:00 PM	SDCC	33B	204
Effects of Radiation on Thermal and Mechanical Properties of Ceramic Oxide Fuels	THU	8:30 AM	SDCC	33B	227
Novel Fuels, Pellet-cladding Interaction, and Modeling	THU	2:00 PM	SDCC	33B	247

Rare Metal Extraction & Processing Symposium

Metalloids and Rare Extraction Process	MON	8:30 AM	SDCC	16B	95
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PROGRAM AT-A-GLANCE

	Day	Time	Building	Room	Page
Indium, Moly, and Tungsten Metallurgy	MON	2:00 PM	SDCC	16B	117
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	270
Calcium and Rare Earth Metallurgy	TUE	8:30 AM	SDCC	16B	139
Titanium, Lithium, Yttrium, and Zirconium	TUE	2:00 PM	SDCC	16B	161
Rhenium, Tin, Vanadium and SX Processing	WED	8:30 AM	SDCC	16B	182

Recycling and Sustainability Update

Recycling	THU	8:30 AM	SDCC	16B	228
Waste	THU	2:00 PM	SDCC	16B	247

Shape Casting: 5th International Symposium

Process Design and Innovation	WED	8:30 AM	SDCC	17B	183
Solidification and Microstructure I	WED	2:00 PM	SDCC	17B	205
Mechanical Properties	THU	8:30 AM	SDCC	17B	228
Solidification and Microstructure II	THU	2:00 PM	SDCC	17B	248

SMD 2014 Technical Division Student Poster Contest

Poster Judging	MON	3:30 PM	SDCC	Sails Pavilion	270
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SMD 2014 Technical Division Young Professional Poster Contest

Posters	MON	6:30 PM	SDCC	Sails Pavilion	271
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Solar Cell Silicon

Silicon Production and Solidification	WED	2:00 PM	Marriott	Balboa	205
Silicon Refining I	THU	8:30 AM	Marriott	Balboa	229
Silicon Refining II	THU	2:00 PM	Marriott	Balboa	248

Solid-State Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment

Mechanical Properties	MON	8:30 AM	SDCC	6D	95
Interface Structures, Defects, and Shock Response	MON	2:00 PM	SDCC	6D	117
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	271
Oxides and Nanostructures I	TUE	2:00 PM	SDCC	4	161
Oxides and Nanostructures II	WED	8:30 AM	SDCC	4	183
Interface Morphology and Stability	WED	2:00 PM	SDCC	4	206
Grain Boundaries I	THU	8:30 AM	SDCC	4	229
Grain Boundaries II	THU	2:00 PM	SDCC	4	249

Solidification in Additive Manufacturing

Session I: Material Behavior in AM Powder Bed Systems	THU	8:30 AM	SDCC	15B	230
Session II: Solidification in Complex and High Build Rate AM systems	THU	2:00 PM	SDCC	15B	249

Symposium on High Entropy Alloys II

Alloy Development and Applications	WED	8:30 AM	SDCC	5A	184
Modeling and Mechanical Properties	WED	2:00 PM	SDCC	5A	206



Day	Time	Building	Room	Page
THU	8:30 AM	SDCC	5A	230
THU	2:00 PM	SDCC	5A	250

TMS2014 General Poster Session

Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	271
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Ultrafine Grained Materials VIII

Keynote Session	MON	8:30 AM	SDCC	6E	95
Special Session: Gradient and Layered Nanostructures	MON	2:00 PM	SDCC	6E	117
Poster Session	MON	6:30 PM	SDCC	Sails Pavilion	273
Young Scientist I: Deformation and Failure Mechanisms	TUE	8:30 AM	SDCC	6E	140
Young Scientist II: Microstructural Evolution	TUE	2:00 PM	SDCC	6E	162
Stability of Nanomaterials	WED	8:30 AM	SDCC	6F	185
Fundamental Deformation Phenomena	WED	8:30 AM	SDCC	6E	184
Powder Processing of Nanomaterials	WED	2:00 PM	SDCC	6E	207
High Pressure Torsion Studies	WED	2:00 PM	SDCC	6F	207
Equal Channel Angular Processing Studies	THU	8:30 AM	SDCC	6E	231
Roll Processing Studies	THU	8:30 AM	SDCC	6F	231
Alternative SPD and Surface Nanostructuring Methods	THU	2:00 PM	SDCC	6E	250
Applications of UFG Materials	THU	2:00 PM	SDCC	6F	251



2014 Aluminum Keynote Session — Innovation in the Alumina and Primary Aluminum Industries: How Will We Move on to the Next S-curve?

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Barry Sadler, Net Carbon Consulting Pty Ltd

Monday AM Room: 6A
February 17, 2014 Location: San Diego Convention Center

Session Chair: Barry Sadler, Net Carbon Consulting Pty Ltd

8:30 AM Introductory Comments from Dr. Barry Sadler, Managing Director, Net Carbon Consulting Pty Ltd

8:35 AM Invited

Focus Areas and Possible Options for Aluminium Smelter Performance Enhancement: *Barry Welch*¹; ¹Universities of NSW and Auckland and Welbank Consulting Ltd.

9:20 AM Invited

Further Innovation in the Bayer Process: Is This a Reality or a Pipe Dream?: *Gerald Roach*

10:05 AM Break

10:15 AM Invited

The Role of External Research Groups in Aluminium Industry Innovation: *Mark Taylor*¹; ¹University of Auckland

10:50 AM Invited

Hydro's Innovation Engine - From Idea to Business: *Martin Segatz*¹; ¹Hydro Aluminium Deutschland GmbH

11:15 AM Invited

Innovation in the North American Aluminum Industry: *Alton Tabereaux*

11:40 AM Invited

Innovation in Mining – Rio Tinto's "Mine of the Future"(TM)Programme: *Geoff Bearne*¹; ¹Rio Tinto Technology and Innovation

12:10 PM Panel Discussion: Questions can be directed from the audience to a panel of the session presenters.

2014 Functional Nanomaterials: Synthesis, Properties and Applications — Nanomanufacturing I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Monday AM Room: Ballroom D
February 17, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Terry Xu, The University of North Carolina at Charlotte; Jung-Kun Lee, University of Pittsburgh; Nitin Chopra, The University of Alabama

8:30 AM Keynote

Innovation in 2D and 3D Nano and Micro Manufacturing: *Henry Smith*¹; ¹MIT

9:15 AM Invited

Sub-10-nm Patterning: Electron-beam Lithography and Templated Self-assembly: *Karl Berggren*¹; ¹MIT

9:45 AM

A Patterned Memory Array of the Metal Oxide Nanostructure Fabricated by Scanning Probe Lithography and Its Functionalization with Bottom Electrodes: *Nuri Lee*¹; William Jo¹; C. Meny²; ¹Ewha Womans University; ²UMR 7504 ULP-CNRS

10:05 AM Break

10:15 AM

A Scalable Aqueous Solution Synthetic Route to Nanophase TiO₂ Using a Continuous Stirred-tank Reactor: *Fuqiang Guo*¹; Amrita Yasin¹; George Demopoulos¹; ¹McGill University

10:35 AM

Electrically-activated Tip Based Lithography for Writing Nanostructures by Electromigration-induced Liquid Flow: *Zhe Chen*¹; Tarang Mungole¹; Carolyn Stansell²; Indranath Dutta¹; ¹Washington State University; ²Boise State University

10:55 AM

Nano-laminated Ti₃Al Porous Structure Produced by Hot Forging and Selective Dissolution: *Wei Daixiu*¹; Koizumi Yuichiro¹; Chiba Akihiko¹; ¹Tohoku University

11:15 AM Invited

ALICE in Wonderland - A Story of Carbon Nanotube Electron Emission in Space: *Jud Ready*¹; Mitchell Walker¹; Graham Sanborn¹; Lake Singh¹; Stephen Turano¹; Peter Collins²; ¹Georgia Institute of Technology; ²Air Force Institute of Technology

2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications — Keynote Session on Nanomaterials, General Properties and Others

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramki Kalyanaraman, University of Tennessee; Haiyan Wang, Texas A&M University; Yuntian Zhu, North Carolina State University; Justin Schwartz, North Carolina State University; Amit Goyal, Oak Ridge National Laboratories

Monday AM Room: Ballroom E
February 17, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Haiyan Wang, Texas A&M University; Ravindra Nuggehalli, NJIT

8:30 AM Keynote

Frontiers in Thin Film Epitaxy and Novel Nanostructured Materials: *Jagdish (Jay) Narayan*¹; ¹North Carolina State University

9:10 AM Keynote

Probing Structure, Properties and Dynamics of Nanostructures through Scanning Transmission Electron Microscopy: *Stephen Pennycook*¹; Wu Zhou¹; Jaekwang Lee¹; Juan-Carlos Idrobo¹; Myron Kapetanakis²; Junhao Lin²; Sokrates Pantelides²; ¹Oak Ridge National Laboratory; ²Vanderbilt University

9:30 AM Keynote

Design and Applications of Nanostructured Energy Materials: *Sungho Jin*¹; ¹UC San Diego

9:50 AM Keynote

Nanogenerators for Self-powered Systems and as Active Sensors: *Zhong Wang*¹; ¹Georgia Institute of Technology

10:10 AM Break

10:30 AM Keynote

Magnetoelectric Control of Exchange Coupling in Monodomain BiFeO₃ Heterostructures: *Chang-Beom Eom*¹; ¹University of Wisconsin-Madison

10:50 AM Keynote

Stress-engineered Self-organized Nanostructure Array Assembly: A Rich Paradigm: *Anupam Madhukar*¹; ¹University of Southern California

11:10 AM Keynote

Mechanical Behaviors of Heterogeneous Nanostructured Metals: *K. Lu*¹; ¹Chinese Academy of Sciences

11:30 AM Keynote

The Principles of Grain Refinement during Severe Plastic Deformation: Terence Langdon¹; ¹University of Southern California

11:50 AM Keynote

Influence of Length Scales on Precipitation Phenomena in Al Alloys: Tao Hu¹; Julie Schoenung¹; *Enrique Lavernia*¹; ¹University of California, Davis

5th International Symposium on High Temperature Metallurgical Processing — High Efficiency New Metallurgical Technology

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

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Mark Schlesinger, Missouri University of Science and Technology; Onuralp Yücel, ITU; Rafael Padilla, University of Concepcion; Phillip Mackey, P.J. Mackey Technology; Guifeng Zhou, Wuhan Iron and Steel

Monday AM
February 17, 2014

Room: 18
Location: San Diego Convention Center

Session Chairs: Tao Jiang, Central South University; Joseph Lessard, Orchard Material Technology

8:30 AM Introductory Comments**8:35 AM Invited**

Slag Structures and Properties by Spectroscopic Analysis: Effect of Water Vapor Relevant to a Novel Flash Ironmaking Technology: *M. Yousef Mohassab-Ahmed*¹; Hong Yong Sohn¹; ¹University of Utah

8:55 AM

An Innovative Electro-winning Process for Titanium Production: *Giuseppe Granata*¹; Yoshinao Kobayashi¹; Ryota Sumiuchi¹; Akio Fuwa¹; ¹Waseda University

9:10 AM Invited

A New Bottom Gas Purging System for Stationary and Tilting Copper Anode Furnaces: *Goran Vukovic*¹; Klaus Gamweger¹; ¹RHI AG

9:25 AM

Iron Removal from Titanium Ore Through Selective Chlorination and Its Reaction Analysis: *Jungshin Kang*¹; Toru Okabe¹; ¹The University of Tokyo

9:40 AM Invited

Lorentz Force Sigmometry: A Novel Technique for Measuring Thermophysical Properties of Molten Metals: *Shatha Alkhalil*¹; Thomas Fröhlich¹; Yurii Kolesnikov¹; André Thess¹; ¹Ilmenau University of Technology

9:55 AM Break**10:05 AM**

A Pilot-plant Scale Test of Coal-based Rotary Kiln Direct Reduction of Laterite Ore for Fe-Ni Production: *Guanghui Li*¹; Junhao Liu¹; Mingjun Rao¹; Jun Luo¹; Changgen Wang¹; Yuanbo Zhang¹; ¹School of Minerals Processing and Bioengineering, Central South University

10:20 AM Invited

Preparation of Ferronickel Alloy Nugget through Reduction Roasting of Nickel Laterite Ore: Pan Chen¹; *Xuwei Lv*¹; Enguang Guo¹; Qiugang Yuan¹; Mei Liu¹; ¹School of Materials Science and Engineering, Chongqing University, China

10:35 AM

Preparation of High Melting Point Alloys and Refractory Compounds with Its Own Chemical Energy: Dou Zhihe¹; Shi Guanyong¹; *Zhang Ting'an*¹; Guan Yue¹; Wen Ming¹; Jiang Xiaoli¹; Niu Liping¹; ¹Northeastern University

10:50 AM

Reductive Sulfur-fixation Smelting of Stibnite Concentrate in Sodium Molten Salt: *Chen Yongming*¹; Xue Haotian¹; Yang Shenghai¹; Tang Chaobo¹; Tang Motang¹; ¹School of Metallurgy and Environment, Central South University, P.R. China

11:00 AM Invited

Research on the Solid-State Reduction Roasting of Phosphate Rock: Pan Chen¹; Enguang Guo¹; Qiugang Yuan¹; Mei Liu¹; *Xuwei Lv*¹; ¹School of Materials Science and Engineering, Chongqing University, China

11:10 AM

Separation of Perovskite Phase from CaO-TiO₂-SiO₂-Al₂O₃-MgO System by Supergravity: Jintao Gao¹; Jun-cheng Li¹; *Zhan-cheng Guo*¹; ¹University of Science and Technology Beijing

11:20 AM

New Process for Producing High Grade Iron Concentrate by Roasting Siderite Ore with Microwave Energy: Shaohua Ju¹; Libo Zhang¹; *Jinhui Peng*¹; Shenghui Guo¹; Xin Wang¹; Yajian Wang¹; ¹Yunnan Provincial Key Laboratory of Intensification Metallurgy

11:30 AM

Optimization of Flow Control Devices in a Twelve-strand Billet Continuous Casting Tundish with Two Strands Closed: *Jiangshan Zhang*¹; Jingshe Li¹; Shufeng Yang¹; ¹University of Science and Technology Beijing

A Lifetime of Experience with Titanium Alloys: An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer — Williams Honorary Session I: Processing Science

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Adam Pilchak, Air Force Research Laboratory; James Larsen, Air Force Research Laboratory; David Dye, Imperial College London; Jay Tiley, Air Force Research Laboratory

Monday AM
February 17, 2014

Room: 1A
Location: San Diego Convention Center

Session Chairs: John Allison, University of Michigan; Adam Pilchak, Air Force Research Laboratory

8:30 AM Invited

Crystal Plasticity Modeling and Validation of Extrusion Texture and Plasticity in a Near-alpha Titanium Alloy: *Xianfeng Ma*¹; Adam Pilchak²; Patrick Martin²; Mei Li³; Dayong Li⁴; John Allison¹; ¹University of Michigan; ²Air Force Research Laboratory; ³Ford Motor Company; ⁴Shanghai Jiao Tong University

9:00 AM Invited

Some Challenges in the Physics of Thermomechanical Processing (TMP) of Alpha/Beta Titanium Alloys: *Lee Semiatin*¹; Adam Pilchak¹; ¹Air Force Research Laboratory

9:30 AM

Evolution of Microstructure and Transformation Texture Due to Variant Selection during Alpha Precipitation in Polycrystalline Alpha/Beta Titanium Alloys – A Simulation Study: *Rongpei Shi*¹; Yunzhi Wang¹; ¹The Ohio State University

9:50 AM

Variant Selection Due to Dislocations during α Precipitation in α/β Titanium Alloys: *Di Qiu*¹; Rongpei Shi²; Weijie Lu¹; Yunzhi Wang²; ¹Shanghai Jiao Tong University; ²Ohio State University

10:10 AM Break**10:30 AM**

Characterization and Modeling of EBAM processed Ti-6Al-4V: Thomas Ales¹; Iman Ghamarian¹; Graciela Penso¹; Vikas Dixit²; Brian Welk²; *Peter Collins*¹; ¹University of North Texas; ²The Ohio State University

10:50 AM

Microstructural Analysis of Ti-6Al-4V Components Made by Electron Beam Additive Manufacturing: *Rashadd Coleman*¹; Kevin Chou¹; Viola Acoff¹; ¹The University of Alabama

11:10 AM

Texture Development of Ti₆Al₄V Components Fabricated by Electron Beam Melting: *Liming Zhou*¹; Rashadd Coleman¹; Viola Acoff¹; ¹The University of Alabama



11:30 AM

Improving Surface Finish of Electron Beam Melting Parts by Laser Ablation: *Ashfaq Mohammad*¹; Muneer Khan¹; Abdulrahman AlAhmari¹; ¹King Saud University

11:50 AM

A Novel Chemical Pathway for Producing Low Cost Ti by Direct Reduction of Ti Slag: *Scott Middlemas*¹; Z. Zak Fang¹; Jun Guo¹; Peng Fan¹; ¹University of Utah

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling — Ion Beam Irradiation

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

Program Organizers: Peter Hosemann, University of California Berkeley; Julie Tucker, Knolls Atomic Power Laboratory; James Cole, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Monday AM
February 17, 2014

Room: 33B
Location: San Diego Convention Center

Session Chair: Peter Hosemann, University of California Berkeley

8:30 AM

Emulation of High Dose Reactor Irradiations of F-M Alloys Using Self-Ions: *Gary Was*¹; Zhijie Jiao¹; Elizabeth Beckett¹; Anthony Monterrosa¹; Janelle Wharry²; Stuart Maloy³; Osman Anderoglu³; Micah Hackett⁴; ¹University of Michigan; ²Boise State University; ³Los Alamos National Laboratory; ⁴TerraPower LLC

9:10 AM

Heavy Ion Irradiations of Fe-Cr Binary Alloys: *Mychailo Toloczko*¹; *Alicia Certain*¹; Frank Garner²; ¹Battelle/PNNL; ²Radiation Effects Consulting

9:30 AM

Peculiarities of Ion Beam Irradiation Studies: *Igor Usov*¹; ¹Los Alamos National Laboratory

9:50 AM

High-Dose Void Swelling in Ion-Irradiated Ferritic-Martensitic Steels: *Anthony Monterrosa*¹; Elizabeth Beckett¹; Zhijie Jiao¹; Gary Was¹; ¹University of Michigan

10:10 AM Break

10:30 AM

Impact of Beam Rastering on Void Swelling in Pure Iron: *Lin Shao*¹; Jonathan Gigax¹; Chao-chen Wei¹; Abdulla Al Nuaimi¹; Di Chen¹; X. Wang¹; F.A. Garner²; ¹Texas A&M University; ²Radiation Effects Consulting

10:50 AM

What Have We Learned from Ion Bombardment Studies to Allow Development of Improved Swelling-resistant Ferritic-martensitic and ODS Alloys for Service to Very High Neutron Fluence?: *Frank Garner*¹; Mychailo Toloczko²; V. Voyevodin³; V. Bryk³; O. Borodin³; A. Kalchenko³; V. Melnichenko³; I. Neklyudov³; Lin Shao⁴; ¹Radiation Effects Consulting; ²Pacific Northwest National Laboratory; ³Kharkov Institute of Physics and Technology; ⁴Texas A&M University

11:10 AM

Implantation and Characterization of Helium in Nuclear Materials at Jannus-Saclay (France): *Lucile Beck*¹; Patrick Trocellier¹; Shradha Agarwal¹; Yves Serruys¹; Sylvain Vaubaillon¹; ¹CEA

11:30 AM

The Effect of External Stress on Ion Irradiation-induced c-Loop Formation in Zry-4: *Rosmarie Hengstler-Eger*¹; Petra Britt Hoffmann¹; Marquis Kirk²; Winfried Petry³; ¹AREVA GmbH; ²Argonne National Laboratory; ³Technische Universität München and Research Neutron Source Heinz Maier-Leibnitz (FRM 2)

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Characterization of Strain

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Materials Characterization Committee, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Khalid Hattar, Sandia National Laboratories; Marko Knezevic, University of New Hampshire; Irene Beyerlein, Los Alamos National Laboratory

Monday AM
February 17, 2014

Room: 8
Location: San Diego Convention Center

Session Chair: Rodney McCabe, Los Alamos National Laboratory

8:30 AM Invited

Analysis of Plastic Deformation by EBSD Techniques: *David Field*¹; ¹Washington State University

9:00 AM

In Situ X-ray Diffraction of Biaxially Deformed Automotive Steels: *David Collins*¹; Richard Todd¹; Angus Wilkinson¹; ¹University of Oxford

9:20 AM

Grain Rotation and Development of Orientation Spread in a Deforming Polycrystal: *Thomas Buchheit*¹; Jay Carroll¹; Hojun Lim¹; Blythe Clark¹; Corbett Battaile¹; Brad Boyce¹; ¹Sandia National Laboratories

9:40 AM Invited

Analysis of Localized Strain Dependencies during Microstructural Evolution by Correlated Precession Diffraction and In Situ TEM: *Mitra Taheri*¹; ¹Drexel University

10:10 AM Break

10:30 AM Invited

Quantifying Stress and Dislocation Density Distributions at the Microstructural Scale using High Resolution Electron Backscatter Diffraction: *Angus Wilkinson*¹; Jun Jiang¹; T Britton²; ¹University of Oxford; ²Imperial College London

11:00 AM

EBSD Cross Correlation Method to Analyze Slip Bands/Grain Boundary Interactions in a Polycrystalline γ' Strengthened Ni-based Superalloy: *Patrick Villechaise*¹; Jonathan CORMIER¹; Baptiste Larrouy¹; ¹Prime Institut ENSMA -CNRS

11:20 AM

Deformation and Damage Behavior in Alloy 617 with Different Strain Rates and Long Term Ageing: *Guocai Chai*¹; Mattias Calmunger¹; Sten Johansson¹; Johan Moverare¹; ¹Linköping University

11:40 AM

Characterization of Near-surface Microstructure of Surface-treated IN718 Superalloy by X-ray Diffraction and TEM: Amrinder Gill¹; Abhishek Telang¹; Tamas Ungar²; Gunther Eggeler³; Hitoshi Soyama⁴; Young-Sik Pyun⁵; Seetha Mannava¹; Dong Qian⁶; *Vijay Vasudevan*¹; ¹University of Cincinnati; ²Lorand Eotvos University; ³Ruhr University Bochum; ⁴Tohoku University; ⁵Sun Moon University; ⁶University of Texas at Dallas

Advanced Composites for Aerospace, Marine, and Land Applications — Processing and Design of Composites

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

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

Monday AM
February 17, 2014

Room: 6F
Location: San Diego Convention Center

Session Chairs: Liang Dong, University of Virginia; Mike Peretti, GE Aviation

8:30 AM Invited

Ultra-strong Light Weight Cellular Lattice Structures: *Liang Dong*¹; Haydn Wadley¹; ¹University of Virginia

9:10 AM

Deformation Behavior of Aluminum Alloy AA6061– 10% Fly Ash Composite for Aerospace Application: Ajit Bhandakkar¹; R C Prasad¹; Shankar ML Sastry²; ¹IIT, Bombay; ²WUSTL

9:30 AM

Compressive Property of Aluminum Foams Fabricated Under Low Pressure: *Zhuokun Cao*¹; Guangchun Yao¹; ¹Northeastern University, China

9:50 AM Break

10:10 AM

Effect of the Composition of B4C -Al Composites on Their Mechanical Properties and Resistance to Corrosion: *Lucio Vazquez*¹; Alejandro Altamirano²; Edgardo Hernandez²; Víctor Cortés²; Elizabeth Garfias²; Elizabeth Refugio²; Manuel Vite¹; ¹IPN; ²Universidad Autonoma Metropolitana

10:30 AM

Bacterial Cellulose Enhances Beta Phase in PVDF: *Vivek Verma*¹; Sampada Bodkhe²; Rajesh PSM¹; Sudhir Kamle¹; ¹IIT Kanpur; ²GE Aviation

10:50 AM

Geopolymer from Industrial Wastes: A Construction Material for 22nd Century: *Pradeep Rana*¹; Radha Dash¹; Ratan Ganguly¹; ¹GIET

11:10 AM Invited

Synthesis TaC-TaB₂ Composite Nano Powders: *Behzad Mehdikhani*¹; Gholam Borhani¹; ¹Malek-e-ashtar University of Technology

Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion II — Advanced Materials for Power Electronics, Power Conversion, and Power Conditioning

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee, TMS: Magnetic Materials Committee

Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael McHenry, Carnegie Mellon University; Matthew Willard, Case Western Reserve University; Rachael Myers-Ward, NRL; Mike Lanagan, Penn State University; Clive Randall, Penn State University

Monday AM
February 17, 2014

Room: Cardiff
Location: San Diego Marriott Marquis & Marina

Session Chair: Paul Ohodnicki, National Energy Technology Laboratory

8:30 AM Introductory Comments

8:35 AM Invited

GE SiC Power Device Development for High Performance Power Conversion Applications: *Peter Losee*¹; ¹GE Global Research

9:05 AM Invited

Dielectrics for Advanced Power Electronics: *Koichi Banno*¹; Shoichiro Suzuki¹; Toshikazu Takeda¹; Akira Ando¹; ¹Murata Manufacturing Co., Ltd.

9:35 AM Invited

CeraLink™: A New Capacitor Technology for Power Electronics Based on Anti-ferroelectric Ceramics and Copper Electrodes: *Christoph Auer*¹; Michael Schossmann¹; Markus Koini¹; Juergen Konrad¹; Markus Puff¹; ¹EPCOS OHG

10:05 AM Break

10:25 AM Invited

The Status of Commercially Viable GaN Based Power Devices: *Michael Briere*¹; ¹ACOO Enterprises LLC

10:55 AM Invited

Nanocrystalline Magnetic Components for Megawatt Scale High Frequency Power Electronics: *William Reass*¹; Jeffery Audia¹; Alex Scheinker¹; ¹Los Alamos National Laboratory

11:25 AM Invited

A New Insight into Nanocrystallization of Amorphous Fe-based Alloys: *Motoki Ohta*¹; Naoki Ito¹; Yoshihito Yoshizawa²; Ryusuke Hasegawa¹; ¹Metglas(R) Inc.; ²Hitachi Metals, Ltd.

Advances in Surface Engineering: Alloyed and Composite Coatings III — Mechanical, Wear, and Corrosion Properties of Coatings

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee

Program Organizers: Sandip Harimkar, Oklahoma State University; Jeff De Hosson, Univ of Groningen; Roger Narayan, University of North Carolina and North Carolina State University; Efstathios (Stathis) Meletis, University of Texas at Arlington; Virendra Singh, Schlumberger Rosharon Campus; Srinivasa Bakshi, Indian Institute of Technology-Madras; Mathieu Brochu, McGill University; Arvind Agarwal, Florida International University; Jian Luo, UC San Diego; Nancy Michael, University of Texas at Arlington; Nuggehalli Ravindra, New Jersey Institute of Technology; Adele Carrado, IPCMS; Choong-un Kim, University of Texas at Arlington; Amit Pandey, Rolls Royce LG Fuel Cell

Monday AM
February 17, 2014

Room: 1B
Location: San Diego Convention Center

Session Chairs: Sandip Harimkar, Oklahoma State University; Patrick Masset, Fraunhofer UMSICHT

8:30 AM Invited

Flexible Diamond-like Carbon Films on Viscoelastic Substrates: An Overview: *Jeff De Hosson*¹; Y Pei¹; Diego Martinez-Martinez¹; ¹Univ of Groningen

8:50 AM Invited

Characterization of Nanostructured Al-Si Claddings on Al-7075 Substrate Using Nano-impact Indentation Technique: Abhi Ghosh¹; Javier Arreguin¹; Jason Milligan¹; *Mathieu Brochu*¹; ¹McGill University

9:10 AM Invited

Improved Mechanical Properties of Cermet Coatings as a Function of Grain Size: *Chris Melnyk*¹; Robert Gansert²; Brian Weinstein¹; David Grant¹; ¹California Nanotechnologies, Inc.; ²Advanced Materials & Technology Services, Inc.

9:30 AM

Sub-surface Mechanical Properties Evaluation of Oilfield Alloys Treated by Surface Ultrasonic Peening: *Virendra Singh*¹; Manuel Marya¹; ¹Schlumberger

9:45 AM

Wear Resistance of Anodic TiO₂ Coating Produced on Ti-6Al-4V Alloys: Maria Vera¹; Mario Rosenberger¹; *Carlos Schvezov*¹; Alicia Ares¹; ¹CONICET-UNAM

10:00 AM

Understanding Compatibilities between Advanced Coatings and Lubricants via Tribo-film Characterization: *Jun Qu*¹; Zhen-bing Cai²; Harry Meyer¹; Cheng Ma¹; Miaofang Chi¹; Huimin Luo¹; ¹Oak Ridge National Laboratory; ²Southwest Jiaotong University



10:15 AM Break**10:25 AM**

Conditioning of Composite Lubricant Powder for Cold Spray: *Maryam Neshastehriz*¹; Ivi Smid¹; Al Segall¹; Tim Eden¹; ¹Penn State

10:40 AM

Wear and Corrosion Performance of Modified Ni-based WC Metal Matrix Composite Overlays for Use in Severe Wear Applications: *Tonya Wolfe*¹; Hani Henein²; Gary Fisher¹; ¹Alberta Innovates - Technology Futures; ²University of Alberta

10:55 AM

Wear Resistance of Iron Aluminide/Titanium Carbide Composite Coatings Prepared by In-Situ Precipitation: *Mahdi Amiryan*¹; Houshang Alamdari¹; Carl Blais¹; Robert Schulz²; ¹Université Laval; ²Hydro-Quebec Research Institute (IREQ)

11:10 AM

Corrosion Resistance of Metals in Molten Zn Alloys: *Jong Min Byun*¹; Seok Hyun Hwang¹; Tae Yeob Kim²; Woo Sung Jung²; Young Do Kim¹; ¹Hanyang University; ²POSCO

11:25 AM

Ni-Al₂O₃ Based Thermal Spray Coatings for Protection Against Erosion: *Harpreet Grewal*¹; Harpreet Arora²; Harpreet Singh¹; Anupam Agrawal¹; Sundeep Mukherjee²; ¹Indian Institute of Technology; ²University of North Texas

11:40 AM

Experimental Investigation of Silt Erosion Resistance of SiC Nanoparticle Reinforced Polyurethane Coating on 16Cr-5Ni Martensitic Steel: *C. Syamsundar*¹; Dhiman Chatterjee¹; M. Kamaraj¹; A. K. Maiti²; ¹Indian Institute of Technology, Madras; ²BHEL (R&D), Hyderabad

11:55 AM

Wear Resistant Cu-Ag Alloys Obtained by Sliding-induced Chemical Nanolayering Reaction: *Fuzeng Ren*¹; Pascal Bellon¹; Robert Averback¹; ¹University of Illinois at Urbana-Champaign

Algorithm Development in Computational Materials Science and Engineering — Algorithms for Lower Length Scale Modeling: Ab Initio, Atomistics and Materials Chemistry: Part I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee
Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas; Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, Army Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology

Monday AM

Room: 31B

February 17, 2014

Location: San Diego Convention Center

Session Chairs: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas

8:30 AM Invited

A Computational Algorithm to Produce Virtual X-ray and Electron Diffraction Patterns of Interfaces from Atomistic Simulations: Shawn Coleman¹; Mehrdad Mirzaei Sichani¹; *Douglas Spearot*¹; ¹University of Arkansas

9:10 AM

Microstructural Characterization of Shape Memory Alloys on the Atomic Scale: *Christoph Begau*¹; Alexander Hartmaier¹; ¹Ruhr-Universität Bochum

9:30 AM

Tracking Microstructure Evolution in Crystalline Materials: A Post-processing Algorithm for Atomistic Simulations: *Jason Panzarino*¹; Seyed Saeidi¹; Timothy Rupert¹; ¹University of California Irvine

9:50 AM

Stick Slip Response of Dislocation Core: *Mishreyee Bhattacharya*¹; Amlan Dutta²; Parthasarathi Barat¹; ¹Variable Energy Cyclotron Centre; ²S.N. Bose

National Centre for Basic Sciences

10:10 AM Break**10:30 AM**

A Fractal Dimension Based Approach to Decipher Grain Boundary Chemomechanics at Quantum Scale: You Sung Han¹; *Vikas Tomar*¹; ¹Purdue University

10:50 AM

Ab Initio Determination of Interfacial Energetics of Alloys: *Liang Qi*¹; Maarten de Jong¹; Mark Asta¹; ¹University of California, Berkeley

11:10 AM

Linear Scaling DFT for Defects in Metals: *Mauricio Ponga*¹; Michael Ortiz¹; Kaushik Bhattacharya¹; ¹California Institute of Technology

11:30 AM

Smart Use of Density Functional Theory Calculations to Drive Newtonian Dynamics: *Reese Jones*¹; Michael Shaughnessy¹; ¹Sandia National Laboratories

Biological Materials Science Symposium — Mechanical Behavior of Biological Materials I: Bone and Teeth (In Honor of Professor Robert O. Ritchie, the 2014 Acta Materialia Gold Medal Award Winner)

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Po-Yu Chen, National Tsing Hua University; Rajendra Kasinath, Johnson and Johnson Company; Dwayne Arola, University of Washington; Kalpana Katti, North Dakota State University

Monday AM

Room: 33A

February 17, 2014

Location: San Diego Convention Center

Session Chairs: Po-Yu Chen, National Tsing Hua University; Wen Yang, ETH Zurich; Dwayne Arola, University of Maryland Baltimore County

8:30 AM Introductory Comments**8:35 AM Invited**

Creep Deformation of Trabecular Bone: *Joanna McKittrick*¹; Ekaterina Novitskaya¹; Robert Sah¹; Darryl D'Lima²; Peter Chen¹; ¹University of California, San Diego; ²Scripps Translational Science Institute

9:05 AM

Micromechanical Characterization of Selected Hierarchical Components of Bovine Cortical Bone: *Kelly Kranjc*¹; Katharine Flores¹; ¹Washington University

9:25 AM

Bird Bones in Bending and Torsion: *Ekaterina Novitskaya*¹; Melisa Ribero Vairo²; Carolyn Zin¹; Marc Meyers¹; Joanna McKittrick¹; ¹UC San Diego; ²Universidad Nacional de Cuyo, Centro Universitario

9:45 AM

Doctor Blading Artificial Nacre and Bone: Sacha Cavelier¹; Xuan Hu¹; *Francois Barthelat*¹; Mohammad Seyed Mirkhalaf¹; ¹McGill University

10:05 AM Break**10:20 AM Keynote**

Multi-scale Study of Deformation and Fracture in Diseased Bone: *Robert Ritchie*¹; Elizabeth Zimmermann²; Hrishikesh Bale¹; Bernd Gludovatz³; Holly Barth⁴; Claire Acevedo³; Alessandra Carriero⁵; Björn Busse²; ¹University of California Berkeley; ²University Medical Center Hamburg-Eppendorf; ³Lawrence Berkeley National Laboratory; ⁴Lawrence Livermore National Laboratory; ⁵Imperial College London

11:00 AM

Molecular and Ultrastructural Changes in Human Bone with Osteogenesis Imperfecta: *Kalpana Katti*¹; Chunju Gu¹; Scott Payne¹; Dinesh Katti¹; ¹North Dakota State University

11:20 AM

Effect of Aging on the Microstructure, Hardness and Chemical Composition of Human Dentin: *Carolina Montoya Mesa*¹; Edgar Ossa Henao¹; Dwayne Arola²; ¹Eafit University; ²University of Maryland Baltimore County

11:40 AM

The Importance of Proteins on the Crack Growth Resistance of Enamel: *Mobin Yahyazadehfar*¹; Dwayne Arola¹; ¹University of Maryland Baltimore County

Bulk Metallic Glasses XI — Alloy Development and Applications I

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

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Monday AM
February 17, 2014

Room: 2
Location: San Diego Convention Center

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

8:30 AM Keynote

Composition Variation of Glass Formation in Novel Multicomponent Ni-based Bulk metallic Glasses: *William Johnson*¹; Jong Ha¹; Marios Demetriou¹; ¹California Institute of Technology

9:00 AM

Formation of In Situ and Ex Situ Composites in Zr-based Bulk Metallic Glass: *Gerhard Castro*¹; Atakan Peker¹; ¹Applied Sciences Laboratory/ Institute for Shock Physics/ Washington State University

9:10 AM Invited

New Atomization Technology for Fine Amorphous Alloy Powder Production: *Y. Yokoyama*¹; Torao Yamagata²; Hiroshi Izaki²; Takuichi Yamagata²; Yusuke Suenaga³; ¹Institute for Materials Research; ²Hard Industry; ³Iwate University

9:30 AM

Development of Ex-situ Bulk Metallic Glass Composites through Tailoring Transformation Character of NiTi-X Secondary Phases: *Hyunseok Oh*¹; Jinkyu Lee²; Yeonwook Kim³; Wancheok Woo⁴; Eunsoo Park¹; ¹Seoul National University; ²Kongju National University; ³Keimyung University; ⁴Korea Atomic Energy Research Institute

9:40 AM Invited

Processing of Bulk Metallic Glasses for Enabling Applications: *Atakan Peker*¹; ¹Washington State University

10:00 AM Break

10:20 AM Invited

Identifying Bulk Metallic Glass Compositions Through Combinatorial Strategies: *Yanhui Liu*¹; Yanglin Li¹; Sungwoo Sohn¹; *Jan Schroers*¹; ¹Yale University

10:40 AM Invited

BMG Nanoglass Synthesized by Mechanical and Chemically Driven Methods: *Hans Fecht*¹; ¹Ulm University

11:00 AM

An Efficient Method to Identify Glass Forming Alloys: *Peter Tsai*¹; Katharine Flores¹; ¹Washington University in St. Louis

11:10 AM Invited

Exploiting Surface Chemistry to Develop Wear-resistant Bulk Metallic Glass Gears for Aerospace and Planetary Gearboxes: *Douglas Hofmann*¹; Joanna Kolodziejska¹; Scott Roberts¹; Laura Andersen²; Kenneth Vecchio²; William Johnson³; Andrew Kennet¹; ¹NASA JPL/Caltech; ²UC San Diego; ³Caltech

11:30 AM

Novel Strategies for Improving the Glass-forming Ability and Mechanical Properties of Zr-based Bulk Metallic Glasses: *Davide Granata*¹; Erwin Fischer¹; Jörg F. Löffler¹; ¹ETH Zürich, Laboratory of Metal Physics and Technology

11:40 AM Invited

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

12:00 PM Invited

Deformations in Nano-sized Pillars of Metallic Glasses: *Jeff De Hosson*¹; ¹Univ of Groningen

Celebrating the Megascale: An EPD Symposium in Honor of David G.C. Robertson — Keynote Session

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, W A School of Mines; Geoffrey Brooks, Swinburne University of Technology

Monday AM
February 17, 2014

Room: 16A
Location: San Diego Convention Center

Session Chairs: Phillip Mackey, P.J. Mackey Technology; Eric Grimsey, Curtin University, W A School of Mines

8:30 AM Introductory Comments

8:35 AM Invited

David Gordon Campbell Robertson: A Biographical Sketch: *John See*¹; ¹Consultant

8:55 AM Invited

Evolution of the Large Copper Smelter – 1800s to 2013: *Phillip Mackey*¹; ¹P.J. Mackey Technology Inc.

9:20 AM Invited

Evolution of the Mega-scale in Ferro-alloy Electric Furnace Smelting: *Lloyd Nelson*¹; ¹Anglo American Platinum Ltd

9:45 AM Invited

From Sulfide Flash Smelting to a Novel Flash Ironmaking Technology: *Hong Yong Sohn*¹; ¹University of Utah

10:10 AM Break

10:25 AM Invited

Fostering Minerals Workforce Skills of Tomorrow through Education and Training Partnerships: *Gavin Lind*¹; ¹Minerals Council of Australia

10:50 AM Invited

Modeling of Ladle Metallurgy in Steelmaking: *Gordon Irons*¹; Krishnakumar Krishnapisharody²; Kevin Graham³; ¹McMaster University; ²Saarstahl; ³Vale

11:15 AM Invited

Process Metallurgy an Enabler of Resource Efficiency – Linking Product Design to Metallurgy: *Markus Reuter*¹; ¹Outotec Oyj

11:40 AM Invited

Horizontal Single Belt Casting (HSBC) of Ca-based, Bulk Metallic Glass (BMG) Strips: *Roderick Guthrie*¹; Mihaiela Isac¹; Donghui Li¹; Luis Calzado¹; ¹McGill University



Characterization of Minerals, Metals and Materials 2014 — Characterization of Ceramics and Clays

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

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhamyies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Monday AM Room: 7A
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Benjamin Iverson, Halliburton; Takashi Nagai, Chiba Institute of Technology

8:30 AM

FTIR and Raman Spectroscopic Investigation on the Structure of CaO-SiO₂-TiO₂ Ternary Slags: *Long Wang*¹; Liangying Wen¹; Jiajia Tu¹; Shengfu Zhang¹; Chenguang Bai¹; ¹Chongqing University

8:50 AM

Characterization of Heavy Clay Ceramic Mixed with Red Mud Waste: *Carlos Mauricio Vieira*¹; Michelle Babisk¹; Sergio Monteiro¹; ¹State University of the North Fluminense

9:10 AM

High Temperature Exposure of Oil Well Cements: *Benjamin Iverson*¹; ¹Halliburton

9:30 AM

Determination of Temperature and Time Calcination of Clays for Production of Metakaolin based on Pozzolanic Activity: *Jonas Alexandre*¹; Afonso Azevedo¹; Gustavo Xavier¹; Sergio Monteiro²; Carlos Mauricio Vieira¹; ¹UENF; ²IME

9:50 AM Break

10:00 AM

Platinum Group Metal Oxide Absorption Properties of Perovskite-type Oxide: *Takashi Nagai*¹; Kazuma Nagumo¹; Hiroyuki Ishii¹; Takuya Wada¹; ¹Chiba Institute of Technology

10:20 AM

PBT/Brazilian Clay Nanocomposites Prepared by Melt Intercalation: Effects of Organophilic Clay Content and Ionizing Radiation Treatment: Mariana Sartori¹; Maiara Ferreira¹; Franciso Dfiaz²; Vijaya Rangari³; Shaik Jeelani³; *Esperidiana Moura*¹; ¹Nuclear and Energy Research Institute, IPEN-CNEN/SP; ²Metallurgical and Materials Engineering Department, Polytechnic School, University of São Paulo; ³Tuskegee University

10:40 AM

Modification Research of Si₃N₄-SiC Heat Absorption Ceramic Material Used for Tower Type Solar Thermal Power Plant: *Meng Liu*¹; Xiaohong Xu²; Jianfeng Wu²; Guotao Xu¹; Gaifeng Xue¹; Jixiong Liu¹; ¹Research and Development center of Wuhan Iron and Steel (group) Corporation; ²Wuhan University of Technology

11:00 AM

Microstructural and Electrical Properties of 0.5 mol% Al₂O₃-0.1 mol% B₂O₃-Doped ZnO Ceramics: Berat Yüksel¹; *Gökhan Hardal*¹; ¹Istanbul University

11:20 AM

Redox Behavior of Macroporous CeO₂-ZrO₂ Solid Solutions: *Hua Wang*¹; ¹Kunming University of Science and Technology

Computational Modeling and Simulation of Advanced Materials for Energy Applications — Starting from Quantum Mechanics

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee

Program Organizers: Lan Li, Boise State University; Laura Bartolo, Kent State University; Cong Wang, Northwestern University; Chandler Becker, NIST

Monday AM Room: Mission Hills
February 17, 2014 Location: San Diego Marriott Marquis & Marina

Session Chair: Lan Li, Boise State University

8:30 AM Introductory Comments

8:40 AM Invited

Ab Initio Simulations of Li-ion Battery Materials: From Modeling of Cationic Ordering and Phase Behavior of the High-voltage Spinel to Large-scale investigations for Novel Electrode Materials and the Materials Project: *Kristin Persson*¹; ¹LBNL

9:10 AM Invited

Computational Approaches to Critical Challenges of Li-air and Li-ion Batteries: Electrolyte Transport and Reactant Spectroscopy: *Boris Kozinsky*¹; ¹Bosch Research

9:40 AM

Density Functional Theory Study on Nitrogen-derived Non-precious Transition Metal Carbon Nanomaterials as Fuel Cell Electrocatalysts: *Guofeng Wang*¹; Shyam Kattel¹; Kexi Liu¹; ¹Univeristy of Pittsburgh

10:00 AM Break

10:20 AM Invited

Theoretical Studies of Hydrogen Effects on Lithium-based Ceramics for Tritium-breeding Application in Fusion Reactor: *Tao Tang*¹; Ruizhi Qiu²; Jiangli Cao³; Yu Wang⁴; ¹China Academy of Engineering Physics; ²Science and Technology on Surface Physics and Chemistry Laboratoy; ³Institute for Advanced Materials and Technology, University of Science and Technology Beijing; ⁴Department of Applied Physics, The Hong Kong Polytechnic University

10:50 AM

Theoretical Study on the Interactions of Impurity Boron on Si(110) Surface with H⁺, OH⁻ and O₂: Jianwen Tang¹; Zili Liu²; *keqiang Xie*¹; Xiumin Chen¹; Wenhui Ma¹; Bin Yang¹; ¹Kunming University of Science and Technology; ²Kunming Metallurgy College

11:10 AM

Reaction Pathways and Activation Energies of Precious Metal-free Electrocatalyst for Oxygen Reduction Reaction: *Shwetank Yadav*¹; Chandra Veer Singh¹; ¹University of Toronto

Computational Thermodynamics and Kinetics — In Honor of Dr. Mark Asta, EMPMD Outstanding Scientist: Session I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

Monday AM Room: 30D
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Jeff Hoyt, McMaster University; Vidvuds Ozolins, University of California, Los Angeles

8:30 AM Introductory Comments

8:35 AM Invited

Atomistic Simulation Studies of Materials Interfaces: Recent Insights and Remaining Challenges: *Mark Asta*¹; ¹University of California, Berkeley

9:10 AM Invited

Compressive Sensing as a Robust and Easy-to-use Tool for Doing Alloy Theory: Weston Nielson¹; Fei Zhou²; Yi Xia¹; Lance Nelson³; Gus Hart³; Vidvuds Ozolins¹; ¹University of California, Los Angeles; ²Lawrence Livermore National Laboratory; ³Brigham Young University

9:40 AM Invited

First-principles Investigation of Mg-Rare Earth Precipitates and LPSO Structures: Ahmed Issa¹; James Saal¹; *Chris Wolverton*¹; ¹Northwestern University

10:10 AM Break

10:30 AM Invited

Accelerated Molecular Dynamics Simulation via “SISYPHUS”: *Axel van de Walle*¹; ¹Brown University

11:00 AM Invited

Interface Thermodynamics and Phase Transformations in Solid-solid Interfaces: T. Frolov¹; *Y. Mishin*²; ¹University of California, Berkeley; ²George Mason University

11:30 AM Invited

Superionic Conductor Lithium Conduction: *Gerbrand Ceder*¹; Yifei Mo¹; Shyue Ping Ong¹; William Davidson Richards¹; ¹Massachusetts Institute of Technology

Data Analytics for Materials Science and Manufacturing — The Business of Data Analytics

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Jeff Simmons, Air Force Research Laboratory; Charles Bouman, Purdue University; Fariba Fahroo, Air Force Office of Scientific Research; Surya Kalidindi, Georgia Institute of Technology; Jeremy Knopp, Air Force Research Laboratory; Peter Voorhees, Northwestern University

Monday AM Room: 15B
February 17, 2014 Location: San Diego Convention Center

Session Chairs: David Furrer, Pratt & Whitney; Russell Irving, GE Global Research

8:30 AM Invited

The MGI and the Role of Theory: *James Warren*¹; ¹NIST

9:00 AM Invited

Analyzing and Mining Materials Data: From Academia to Industry: *Bryce Meredig*¹; C. Wolverton²; ¹Citrine Informatics; ²Northwestern University

9:30 AM Invited

Foundational Engineering Problem: Uncertainty Quantification in Multi-disciplinary Analysis of Bulk Residual Stresses in Disks: *Lauren Gray*¹; Grant Reinman¹; Vasisht Venkatesh¹; Vikas Saraf²; Christopher Szczepanski³;

Michael Caton³; ¹Pratt & Whitney; ²ATI Ladish Forging; ³Air Force Research Laboratory

10:00 AM Break

10:30 AM Invited

An ICME Example in Production: ICME-net: *Russell Irving*¹; ¹GE

11:00 AM Invited

Rapid Ideation, Modeling and Simulation in a Collaborative Crowdsourcing Environment for Evolutionary Design (CEED): *Joseph Salvo*¹; Rusty Irving¹; ¹GE

11:30 AM Invited

Phase-based Property Data Informatics: *Carelyn Campbell*¹; Ursula Kattner¹; Alden Dima¹; ¹National Institute of Standards and Technology

Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — Shock-Compression of Materials

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Monday AM Room: 3
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

8:30 AM Introductory Comments

8:35 AM Keynote

On the Shocking Behavior of Professor Marc Meyers: *L. Murr*¹; ¹University of Texas at El Paso

9:05 AM Invited

On the Behaviour of Condensed Matter in Extremes: *Neil Bourne*¹; ¹AWE

9:25 AM

Alpha/Omega Orientation Relationships and Habit Planes in Shocked Zr: *Robert Dickerson*¹; Robert Field¹; Juan Escobedo-Diaz¹; Ellen Cerreta¹; ¹Los Alamos National Laboratory

9:45 AM Invited

The Influence of Shock-loading Path and Wave Profile on the Spallation Response of Ta: *George Gray*¹; Neil Bourne²; Veronica Livescu¹; Carl Trujillo¹; ¹Los Alamos National Laboratory; ²AWE Aldermaston

10:05 AM Break

10:25 AM

Shock Compression Behavior of Bi-material Powder Composites with Disparate Melting Temperatures: *Kyle Sullivan*¹; Damian Swift¹; Matthew Barham¹; James Stolken¹; Joshua Kuntz¹; Mukul Kumar¹; ¹Lawrence Livermore National Lab

10:45 AM Invited

Instability of Explosively Collapsing Thick-walled Homogeneous and Laminate Cylinders: *Vitali Nesterenko*¹; Karl Olney¹; Po-Hsun Chiu¹; Melissa Ribero Vairo²; Andrew Higgins³; Matt Serge³; David Benson¹; ¹University of California, San Diego; ²Universidad Nacional de Cuyo; ³McGill University

11:05 AM Invited

Fabrication of Parts for Nuclear Reactors by Explosive Compaction: *A.G. Mamalis*¹; A. Szalay²; ¹Project Center for Nanotechnology and Advanced Engineering, NCSR; ²S-Metalltech 98 Materials Research and Development Ltd

11:25 AM

The Role of Interfaces on Shock-induced Damage in Two-phase Metals: Copper-lead: *Saryu Fensin*¹; Ellen Cerreta¹; George Gray¹; Brian Patterson¹; Steve Valone¹; Juan Escobedo-Diaz¹; Carl Trujillo¹; ¹Los Alamos National Laboratory



11:45 AM

Contrasting the Microstructural Response of Cold Rolled and Annealed Copper to Shock Loading: *Daniel Higgins*¹; Bo Pang¹; Ian Jones¹; Yu Lung Chiu¹; Jeremy Millett²; Glenn Whiteman²; ¹University of Birmingham; ²AWE

Energy Technologies and Carbon Dioxide Management — Alternative Green Processes

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Education Committee, TMS: Energy Committee

Program Organizers: Cong Wang, Northwestern University; Jan de Bakker, BBA, Inc; Cynthia Belt, Consultant; Animesh Jha, University of Leeds; Neale Neelameggham, Ind LLC; Soobhankar Patil, MOXST Inc.; Leon Prentice, CSIRO

Monday AM
February 17, 2014

Room: Balboa
Location: San Diego Marriott Marquis & Marina

Session Chairs: Cong Wang, Northwestern University; Adam Powell, INFINIUM, Inc.

8:30 AM Introductory Comments

8:35 AM Keynote

TMS Initiatives in Energy and Sustainability: *George Spanos*¹; Justin Scott¹; ¹The Minerals, Metals & Materials Society

8:55 AM Keynote

A Review: Solar Thermal Reactors for Materials Production: Ben Ekman¹; *Geoff Brooks*¹; M Rhamdhani¹; ¹Swinburne University

9:20 AM

Liquid Metal, a Heat Transport Fluid for High Temperature Solar Concentrator Application: *Peter Hosemann*¹; David Frazier¹; Cristian Cionea¹; Stephen Parker¹; Miroslav Popovic¹; Ouliana Panova¹; Mark Asta¹; ¹UC Berkeley

9:40 AM

Effect of Cu Thin Films' Thickness on the Electrical Parameters of Metal-porous Silicon Direct Hydrogen Fuel Cell: *Cigdem Oruc Lus*¹; Sevinc Yildirim¹; ¹Yildiz Technical University

10:00 AM Break

10:20 AM Keynote

Cool Roofs and Solar Shingles: *Husnu Kalkanoglu*¹; ¹CertainTeed Corporation

10:45 AM

Preparation of Silica Encapsulated Stearic Acid as Composite Phase Change Material via Sol-gel Process: *Xueting Liu*¹; *Hao Bai*¹; Yuanyuan Wang¹; Kang Zhou¹; Hong Li¹; ¹University of Science and Technology Beijing

11:05 AM

Ferroelectric-enhanced Photocatalysis with TiO₂/BiFeO₃: *Yiling Zhang*¹; Gregory Rohrer¹; Paul Salvador¹; ¹Carnegie Mellon University

11:25 AM

Photochemical Activity of Heterostructured Core/Shell Particles: Nanostructured TiO₂ Shells Surrounding Microcrystalline ATiO₃ (A = Ba, Sr, Pb, Fe) Cores: *Li Li*¹; Paul Salvador¹; Gregory Rohrer¹; ¹Carnegie Mellon University

11:45 AM

Cellulose Acetate Membranes for CO₂ Separation from Water-gas-shift Reaction Products: *Naidu Seetala*¹; Upali Siriwardane²; Tushar Kudale²; ¹Grambling State University; ²Louisiana Tech University

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Emerging Technologies for Data-driven Fatigue Descriptions

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

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

Monday AM
February 17, 2014

Room: 7B
Location: San Diego Convention Center

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

8:30 AM Introductory Comments

8:35 AM Keynote

Advances in Fatigue Crack Growth Modeling: *Huseyin Sehitoglu*¹; Piyas Chowdury¹; Garrett Pataky¹; Richard Rateick²; Hans Maier³; ¹University of Illinois; ²Honeywell Aerospace; ³University of Hannover

9:15 AM Invited

Exploiting MEMS Technologies to Investigate the Fatigue Properties of Micro and Nano Scale Materials: *Olivier Pierron*¹; ¹Georgia Institute of Technology

9:35 AM Invited

X-Ray Micro Computed Tomography Based Study of the Effects of Copper-rich Segregation Structures on Microstructurally-small Fatigue-crack Propagation in Al-Cu Alloys: *Jacob Hochhalter*¹; Vipul Gupta²; John Newman¹; F Parker¹; Scott Willard³; Edward Glaessgen¹; Stephen Smith¹; ¹NASA LaRC; ²National Institute of Aerospace; ³Science & Technology Co

9:55 AM Invited

High-temperature Creep-Fatigue Behavior Study of INCONEL Alloy 617 by In Situ Neutron Diffraction: Bo-Han Wu¹; Yu-Lih Huang¹; Harjo Stefanus²; *E-Wen Huang*¹; Gong Wu²; ¹National Central University; ²High Energy Accelerator Research Organization

10:15 AM Break

10:35 AM Invited

Microstructure-sensitive Fatigue using a Quantitative NDE Approach: *Antonios Kotsos*¹; Kavan Hazeli¹; Jefferson Cuadra¹; Rami Carmi¹; ¹Drexel University

10:55 AM

SEM Study of Fatigue Crack Growth Behavior in Duplex Stainless Steels: *Ru Lin Peng*¹; Guo-Cai Chai²; Sten Johansson¹; Robert Eriksson¹; ¹Linköping University; ²Sandvik Materials Technology

11:15 AM

Microscale Cyclic Deformation of Nanocrystalline NiTi Shape Memory Alloys: *Hassan Ghassemi Armaki*¹; Sharvan Kumar¹; ¹Brown University

11:35 AM

Evolution of Short Crack Propagation in Nickel-base Superalloy Using X-ray Tomography: *Olivier Messe*¹; Cathie Rae¹; Joel Lachambre²; Jean-Yves Buffière²; Andrew King³; ¹University of Cambridge; ²INSA Lyon; ³Synchrotron SOLEIL

11:55 AM Concluding Comments

Fluidization Technologies for the Mineral, Materials, and Energy Industries — Fluidization Technologies for the Mineral, Materials, and Energy Industries

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

Program Organizers: Jerome Downey, Montana Tech of the Univ of Montana; Lawrence May, Hazen Research, Inc.

Monday AM Room: 17B
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Jerome Downey, Montana Tech of the University of Montana; Lawrence May, Hazen Research, Inc.

8:30 AM Invited

Fluidized Bed Technology in Practical Examples: *Andre Krzysik*¹; ¹Metso Minerals

8:55 AM Invited

Fluidized Bed Applications for the Minerals Industry and Renewable Energy: *Marcus Runkel*¹; *Andreas Wirtz*²; *Joerg Hammerschmidt*²; *Kent Pope*²; ¹Outotec (USA) Inc.; ²Outotec GmbH; ³Outotec (USA) Inc., Energy Technology Center

9:20 AM Invited

Evaluating a Fluidized-bed Process through Applied Research and Development: A Practical Approach to a Successful Project: *Lawrence May*¹; *Harry Mudgett*¹; ¹Hazen Research, Inc.

9:45 AM

Experiment Study on Elutriation Characteristics of Slag Bearing High Titania in Gas-solid Fluidized Bed: *Guoliang Yin*¹; *Liangying Wen*¹; *Hailong Liang*¹; ¹Chongqing University

10:10 AM Break

10:20 AM Invited

Energy Efficient Fluidized Bed Systems: *Kamal Adham*¹; ¹Hatch Ltd.

10:45 AM Invited

The Use of Pilot Scale Fluidized Beds for the Development of a Commercial Plant Design: *Jesse White*¹; *Arlin Olson*²; ¹Hazen Research, Inc; ²THOR Treatment Technologies

11:10 AM

Advanced Green Petroleum Coke Calcination In Electrothermal Fluidized Bed: *Aleksandr Kozlov*¹; *Yaroslav Chudnovsky*¹; *Mark Khinkis*¹; *Huajun Yuan*²; *Mark Zak*³; ¹Gas Technology Institute; ²Superior Graphite; ³Industrial Consultant

11:35 AM

Study on Phosphorus Removal of High-phosphorus Iron Ore by Microwave Carbothermic Reduction and Separation: *Zhou Cai*¹; ¹Chongqing University of Science and Technology

Gamma TiAl Alloys 2014 — Session I

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Titanium Committee

Program Organizers: Young-Won Kim, Gamteck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimiduk, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

Monday AM Room: 6B
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Wilfried Smarsly, MTU Aero Engines GmbH; Juraj Lapin, Slovak Academy of Sciences

8:30 AM Introductory Comments

8:40 AM Invited

The Industrialization of Near-net Shape Titanium Aluminide Investment Castings: *Paul McQuay*¹; ¹Precision Castparts Corp

9:10 AM

Study on Hot-cracking of TiAl-based Alloys: *Tian Jing*¹; *Masayuki Nishida*²; *Xiao Shulong*¹; *Xu Lijuan*¹; *M. Rifai Muslih*³; *Chen Yuyong*¹; ¹Harbin Institute of Technology; ²Kobe City College of Technology; ³National Nuclear Energy Agency in Indonesia

9:30 AM Invited

A Quarter Century Journey of Boron as a Grain Refiner in TiAl Alloys: *Dawei Hu*¹; ¹University of Birmingham

9:55 AM

Response of Melt Treatment on the Solidified Microstructure of Ti48Al2Cr2Nb Alloy: *Hongchao Kou*¹; *Guang Yang*¹; *Jun Wang*¹; *Rui Hu*¹; *Jinshan Li*¹; ¹Northwestern Polytechnical University

10:15 AM Break

10:35 AM Invited

Near-net-shape Casting of TiAl Components for Aero Engine Applications: A Casting Process Evaluation: *Julio Aguilar*¹; *Oliver Kaettlitz*¹; *Todor Stoyanov*¹; *Ruediger Tiefers*¹; *Santhanu Jana*¹; ¹Access e.V.

11:00 AM

Impact of ISM Crucible Tilting Process on Mould Filling and Yield of Near-net Shape TiAl Turbine Blades: *Oliver Kaettlitz*¹; *Julio Aguilar*¹; *Santhanu Jana*¹; ¹Access e.V.

11:20 AM

Effect of Centrifugal Force and Pouring Atmosphere on Casting Quality of TiAl Base Alloys: *Seung Eon Kim*¹; *Seong Woong Kim*¹; *Jae Keun Hong*¹; *Young Sang Na*¹; *Jong Moon Park*²; *Myung Hoon Oh*²; *Dongyi Seo*²; *Young Jig Kim*⁴; ¹Korea Institute of Materials Science; ²Kumoh National Institute of Technology; ³National Research Council Canada; ⁴Sung Kyun Kwan University

11:40 AM

Fracture and Fatigue Crack Growth Behavior of Cast Titanium Aluminide: *Mohsen Seifi*¹; *Matt Dahar*¹; *Petharnan Subramanian*²; *Bernard Bewlay*²; *John Lewandowski*¹; ¹Case Western Reserve University; ²GE Global Research Center

High-temperature Gamma (f.c.c.) /Gamma-Prime (L12 structure) Co-Al-W Based Superalloys — Diffusion Behavior and Phase Equilibria

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee

Program Organizers: David Seidman, Northwestern University; David Dunand, Northwestern University; Chantal Sudbrack, NASA Glenn Research Center; Carelyn Campbell, National Institute of Standards and Technology; Ursula Kattner, National Institute of Standards and Technology; David Dye, Imperial College

Monday AM Room: 5A
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Carelyn Campbell, National Institute of Standards and Technology; Ursula Kattner, National Institute of Standards and Technology

8:30 AM Introductory Comments

8:35 AM Plenary

Recent Progress in Co-Base Superalloy: *Kiyohito Ishida*¹; ¹Tohoku University

9:15 AM Invited

Interdiffusion and Atomic Mobility in f.c.c Co-Al Based Ternary Alloys: *Yuwen Cui*¹; *Jose M. Torralba*¹; *Toshihiro Omori*²; *Ryosuke Kainuma*²; *Kiyohito Ishida*²; ¹IMDEA Materials Institute; ²Tohoku University

9:45 AM

The Effect of Quaternary Alloying Additions on Diffusivity in the Co-Al-W System: *Robert Rhein*¹; *Tresa Pollock*¹; ¹University of California Santa Barbara



10:05 AM Break**10:25 AM Invited**

A Many Fold Way to Model the Thermodynamics of Co-Al-W: *Suzana Fries*¹; Mauro Palumbo²; Abed Al Hasan Breidi²; Joerg Kossmann¹; Thomas Hammerschmidt¹; Steffen Neumeier³; Mathias Goeken³; ¹ICAMS, Ruhr University Bochum; ²ICAMS SKTS; ³GMP, University Erlangen-Nuernberg

10:55 AM Invited

Phase Equilibria in the Ternary Co-W-Al Alloy System: *Eric Lass*¹; ¹NIST

11:25 AM

Stability of TCP Phases in Co-based Superalloys: Comparison of Ab Initio Results with Structure Maps: *Jörg Koßmann*¹; Ralf Drautz¹; Thomas Hammerschmidt¹; ¹ICAMS, Ruhr-University Bochum

11:45 AM

Thermodynamic Database for High Temperature Co-based Superalloys: *Jun Zhu*¹; Chuan Zhang¹; Weisheng Cao¹; Shuanglin Chen¹; Fan Zhang¹; ¹CompuTherm LLC

High-temperature Material Systems for Energy Conversion and Storage — High Temperature Separation Membranes & Energy Conversion Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Energy Conversion and Storage Committee

Program Organizers: Kyle Brinkman, Savannah River National Laboratory (SRNL); Xingbo Liu, West Virginia University; Kevin Huang, University of South Carolina

Monday AM
February 17, 2014

Room: Carlsbad
Location: San Diego Marriott Marquis & Marina

Session Chairs: Frank Chen, University of South Carolina; Junhang Dong, University of Cincinnati

8:30 AM Invited

First Principles Modeling of Hydrogen Permeation through Intermetallic Alloys, Amorphous Metals, and Proton Conducting Perovskites: *David Sholl*¹; Rongshun Zhu¹; Nita Chandrasekhar¹; ¹Georgia Tech

9:00 AM

Cost-effective Low-temperature Protonic Ceramic Fuel Cells: *Jianhua Tong*¹; Meng Shang¹; Daniel Clark¹; Stefan Nikodemski¹; Phil Parilla²; David Ginley²; Joseph Berry²; Ryan O'Hayre¹; ¹Colorado School of Mines; ²National Renewable Energy Laboratory

9:20 AM

Active Metals Surface Modified BaCo_{0.7}Fe_{0.2}Nb_{0.103}-d Membranes for Hydrogen Production from Coke Oven Gas: *Wei Tao*¹; Hongwei Cheng¹; Naijun Zhang¹; Xionggang Lu¹; ¹Shanghai University

9:40 AM

Multi-scale Membrane Design: *Kyle Brinkman*¹; Kenneth Reifsnider²; Frank Chen²; Fazle Rabbi²; Lin Ye²; Wilson Chiu³; William Harris³; Dong Su⁴; Yong Chu⁴; Jun Wang⁴; Yu-chen (Karen) Chen-Wiegart⁴; ¹Savannah River National Laboratory (SRNL); ²University of South Carolina; ³University of Connecticut; ⁴Brookhaven National Laboratory

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

Characterization of La₂NiO_{4+d} Infiltrated La_{0.6}Sr_{0.4}Co_{0.8}Fe_{0.203}-d Cathode for Solid Oxide Fuel Cells: *Xinxin Zhang*¹; Hui Zhang¹; *Xingbo Liu*¹; ¹West Virginia University

10:40 AM

Thermoelectric Energy Conversion in Transient Thermal Gradients: *Jeffrey Fergus*¹; Kirk Yerkes²; Kevin Yost²; Ryan Snyder²; ¹Auburn University; ²Wright-Patterson Air Force Research Lab

11:00 AM

Antiferromagnetic and Expansion Behavior of Alkaline-doped Lanthanum Ferrites: *Patrick Price*¹; Geoffrey Beausoleil¹; David Thomsen¹; Darryl Butt¹; ¹Boise State University

11:20 AM

High Temperature Composite in Coating of Petrochemistry Reactors: *Ilyoukha Nickolai*¹; Valentina Timofeeva¹; ¹Academic Ceramic Center

11:40 AM

The Impact of Temperature and Chemistry on Phase Equilibria in Coal-petcoke Gasification Slags Containing High Vanadium Oxide: *Jinichiro Nakano*¹; Kyei-Sing Kwong¹; James Bennett¹; Xueyan Song²; Anna Nakano¹; ¹US DOE NETL; ²West Virginia University

Hume-Rothery Award Symposium: Thermodynamics and Kinetics of Engineering Materials — Thermodynamic Modeling and Phase Diagrams

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Alloy Phases Committee

Program Organizers: Hans Juergen Seifert, Karlsruhe Institute of Technology (KIT); Alan Luo, The Ohio State University; Peter Uggowitzer, ETH Zürich; Fan Zhang, CompuTherm, LLC

Monday AM
February 17, 2014

Room: 6C
Location: San Diego Convention Center

Session Chairs: Hans Juergen Seifert, Karlsruhe Institute of Technology (KIT); Fan Zhang, CompuTherm

8:30 AM Invited

Phase Diagrams - The Beginning of Wisdom: *Rainer Schmid-Fetzer*¹; ¹Clausthal University of Technology

9:10 AM Invited

Broad Guidelines in Predicting High-entropy Alloy Formation: *Yong Zhang*¹; ¹University of Science and Technology Beijing

9:30 AM

Ab Initio Prediction of Chemical Trends for Phase Transitions in Magnetic Shape Memory Alloys: *Biswanath Dutta*¹; *Tilmann Hickel*¹; Jörg Neugebauer¹; ¹Max-Planck-Institut fuer Eisenforschung GmbH

9:50 AM

Modeling of Thermal Vacancies in Metals within the Framework of the Compound Energy Model: *Peter Franke*¹; ¹Karlsruhe Institute of Technology

10:10 AM Break**10:30 AM Invited**

Progress of First-principles Study on Phase Equilibria by Cluster Variation Method: *Tetsuo Mohri*¹; Ying Chen²; ¹Hokkaido University; ²Tohoku University

10:50 AM

Temperature-dependent Properties of TCP Phases in Re-based Alloys: *Mauro Palumbo*¹; Suzana G Fries¹; Dario Alfè²; Alain Pasturel³; ¹ICAMS, Ruhr-Universität Bochum; ²University College London; ³SIMAP, UMR CNRS-INPG-UJF 5266

11:10 AM

Thermodynamic Modeling of Liquid-gas Equilibrium in NaCl-KCl-ZnCl₂ Ternary: *Venkateswara Rao Manga*¹; Stefan Bringer¹; Saivenkataraman Jayaraman²; Pierre Deymier¹; Krishna Muralidharan¹; ¹University of Arizona; ²Massachusetts Institute of Technology

ICME: Linking Microstructure to Structural Design Requirements — ICME: Linking Microstructure to Structural Design Requirements I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Rajiv Mishra, University of North Texas; David Furrer, Pratt & Whitney; Peter Collins, University of North Texas; Charles Ward, Air Force Research Laboratory; Craig McClung, Southwest Research Institute

Monday AM Room: 31A
February 17, 2014 Location: San Diego Convention Center

Session Chair: Rajiv Mishra, University of North Texas

8:30 AM Invited

Estimation of Bounds on Strength and Ductility in Titanium Alloys: *Paul Dawson*¹; Marc De Graef²; Tresa Pollock³; Robert Suter²; Matthew Miller¹; James Williams⁴; ¹Cornell University; ²Carnegie Mellon University; ³University of California, Santa Barbara; ⁴Ohio State University

9:10 AM

Strategies for Embedding Validated Microstructure-sensitive Material Models to Solve Engineering Problems: *Ricardo Lebensohn*¹; ¹Los Alamos National Laboratory

9:30 AM

Using the DAMASK Suite to Study Micro Mechanics and Crystal Plasticity of Heterogeneous Materials: *Philip Eisenlohr*¹; Martin Diehl²; Pratheek Shanthraj²; Christoph Kords²; Franz Roters²; ¹Michigan State University; ²Max-Planck-Institut für Eisenforschung

9:50 AM

Non-schmid Crystal Plasticity Modeling of Deformation of Single Crystal Niobium: *Aboozar Mapar*¹; Farhang Pourboghra¹; Thomas Bieler¹; Christopher Compton²; ¹Michigan State University; ²National Superconducting Cyclotron Lab

10:10 AM Break

10:30 AM

Dislocation Glide through Non-randomly Distributed Point Obstacles: *Alban de Vaucorbeil*¹; Chad Sinclair¹; Warren Poole¹; ¹University of British Columbia

10:50 AM

Crystal Plasticity Finite Element Modeling of Heterogeneous Deformation of Pb-free Tin Based Solder Joints: *Payam Darbandi*¹; *Farhang Pourboghra*¹; Thomas Bieler¹; Tae-kyu Lee¹; ¹Michigan State University

Length Scaling of Lamellar and Patterned Microstructures During Solid-Solid Phase Transformations and Solidification — Nucleation and Crystallographic Effects

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee, TMS: Solidification Committee
Program Organizers: Robert Hackenberg, Los Alamos National Lab; Carlos Capdevila-Montes, CENIM-CSIC; Amy Clarke, Los Alamos National Laboratory; John Perepezko, University of Wisconsin-Madison

Monday AM Room: 32A
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Tadashi Furuhashi, Tohoku University; Jeffrey Hoyt, McMaster University

8:30 AM Invited

Effects of Ferrite/Austenite Orientation Relationship on Pearlite Transformation and Interphase Precipitation of Alloy Carbide: *Goro Miyamoto*¹; Yongjie Zhang¹; Yosuke Karube²; Tadashi Furuhashi¹; ¹Tohoku University; ²Nippon Steel & Sumitomo Metal

9:00 AM Invited

Molecular Dynamics Simulation of Nucleation and Growth of Ferrite from Austenite: *Jeffrey Hoyt*¹; Huajing Song¹; ¹McMaster University

9:30 AM Invited

Symmetry of Austenite Diffusional Transformation Products in Steel: *Annika Borgenstam*¹; ¹KTH

10:00 AM Break

10:20 AM Invited

Pattern Formation in Pearlite Structure: A View from Ferrite Crystallography: *Tadashi Furuhashi*¹; ¹Tohoku University

10:50 AM

Elastic Interactions between Lamellar Structural Units within LPSO Structure in Magnesium Alloys: *Xinfu GU*¹; Tadashi Furuhashi¹; ¹Institute for Materials Research, Tohoku University, Japan

11:15 AM Invited

Enhanced Nucleation of the fcc-phase in Liquid Metals by Icosahedral Quasicrystals: *Michel Rappaz*¹; Güven Kurtuldu; ¹EPFL

Long-term Stability of High Temperature Materials — Phase Changes in Bulk Material

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee
Program Organizers: Mark Hardy, Rolls-Royce plc; Awadh Pandey, Pratt & Whitney Rocketdyne; David Mourer, General Electric Aircraft Engines; Jeffrey Hawk, National Energy Technology Laboratory

Monday AM Room: 4
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Mark Hardy, Rolls-Royce plc; Jeffrey Hawk, National Energy Technology Laboratory

8:30 AM

Microstructural Stability in Advanced 9% Cr Martensitic Steel: *Jeffrey Hawk*¹; Paul Jablonski¹; ¹U.S. Department of Energy, National Energy Technology Laboratory

8:50 AM

Phase Stability in High Cobalt-containing Nickel-based Superalloys: *Katerina Christofidou*¹; Nicholas Jones¹; Steffen Neumeier²; Mark Hardy³; Howard Stone¹; ¹University of Cambridge; ²University of Erlangen-Nuremberg; ³Rolls-Royce plc

9:10 AM

Nano Twinning Induced Toughening in Alloy 617 with Long Term Ageing: *Guocai Chai*¹; Mattias Calmunger²; Sten Johansson²; Johan Moverare²; ¹Sandvik Materials Technology; ²Linköping University

9:30 AM

High Temperature Stability of High Entropy Alloys: *Nicholas Jones*¹; Aliqi Frezza²; Bryce Conduit³; John Aveson¹; Howard Stone¹; ¹University of Cambridge; ²University of Padova; ³Rolls-Royce plc

9:50 AM

Atomic Imaging of M2B-type Boride in Nickel-based Superalloy: *Xiaobing Hu*¹; Yinlian Zhu¹; Xiuliang Ma¹; ¹Institute of Metal Research, Chinese Academy of Sciences

10:10 AM Break

10:30 AM

The Role of Al:Nb Ratio and Long Term Exposure Temperature on the Precipitate Distribution of Nickel Base Superalloys: *Paul Mignanelli*¹; David Collins²; Bryce Conduit³; Ayan Bhowmik¹; Nicholas Jones¹; Mark Hardy³; Howard Stone¹; ¹University of Cambridge; ²University of Oxford; ³Rolls-Royce plc



10:50 AM

Microstructural Changes in Inconel® Alloy 740 after Long-term Aging in the Presence and Absence of Stress: *Peter Tortorelli*¹; K.A. Unocic¹; J.P. Shingledecker²; ¹Oak Ridge National Laboratory; ²Electric Power Research Institute

11:10 AM

Coarsening Mechanism for Y-Ti-O Nanofeatures in Aged MA₉₅₇: *Nicholas Cunningham*¹; G. Odette¹; Matthew Alinger²; Doug Klingensmith¹; ¹UC Santa Barbara; ²GE Global Research

11:30 AM

Microstructure Stability of a Ni-Cr-W Superalloy Subjected to Long-term Aging to Elevated Temperature: *Rui Hu*¹; Yang Chen¹; Hongchao Kou¹; Tiebang Zhang¹; Jinshan Li¹; ¹State Key Lab of Solidification Processing, Northwestern Polytechnical University

Magnesium Technology 2014 — Keynote Session

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Monday AM Room: 17A
February 17, 2014 Location: San Diego Convention Center

Session Chair: Martyn Alderman, Magnesium Elektron

8:30 AM Introductory Comments: Welcome and Review of Magnesium Committee Meeting

8:35 AM Award Presentation: Best Paper and Poster Awards from Magnesium Technology 2013 in San Antonio

8:45 AM Keynote

Automotive Magnesium: Impacts and Opportunities: *William Joost*¹; ¹U.S. Department of Energy

9:20 AM Keynote

Alloy Development, Manufacturing and Design for Magnesium Applications: *Alan Luo*¹; ¹The Ohio State University

9:50 AM Break

10:10 AM Keynote

Life Cycle Assessment of Eco-Magnesium Alloy Produced by Green Metallurgy EU Project Process Route: *Fabrizio D'Errico*¹; Gerardo Plaza; Franz Giger²; Shae K. Kim³; ¹Politecnico di Milano; ²Buhler AG; ³Korea Institute of Industrial Technology

10:40 AM Invited

The IMA Study on the Life Cycle Assessment (LCA) of Magnesium: *Horst Friedrich*¹; Simone Ehrenberger¹; ¹Institute of Vehicle Concepts, German Aerospace Centre (DLR)

11:10 AM

Dynamic Behaviour of a Rare Earth Containing Mg Alloy, WE₄₃B-T₅, Plate with Comparison to Conventional Alloy, AM₃₀-F: *Sean Agnew*¹; Jishnu Bhattacharyya¹; Matt Shaeffer²; Kalia Ramesh²; Wilburn Wittington³; Andrew Oppedal³; Haitham El Kadiri³; Richard DeLorme⁴; Bruce Davis⁴; ¹University of Virginia; ²John Hopkins University; ³Mississippi State University; ⁴Magnesium Elektron, North America

11:40 AM

Thermodynamic and Kinetic Calculations for TRC (Twin Roll Casting) Mg Alloy Design: *In-Ho Jung*¹; Manas Paliwal¹; ¹McGill University

Materials and Fuels for the Current and Advanced Nuclear Reactors III — Fuels I

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

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Monday AM
February 17, 2014

Room: 33C
Location: San Diego Convention Center

Session Chair: Ramprashad Prabhakaran, Idaho National Laboratory

8:30 AM Invited

The Fuel Fabrication Capability and Uranium-molybdenum Alloy: An Overview: *Douglas Burkes*¹; David Senor¹; ¹Pacific Northwest National Laboratory

8:55 AM

Characterization of U-7Mo Alloy Microstructure Irradiated to High Fission Density: *Dennis Keiser*¹; Jan-Fong Jue¹; Jian Gan¹; Brandon Miller¹; Adam Robinson¹; Pavel Medvedev¹; ¹Idaho National Laboratory

9:10 AM

Microstructural Characteristics of As-fabricated Monolithic U-Mo Nuclear Fuels: *Jan-Fong Jue*¹; Dennis Keiser¹; Cynthia Breckenridge¹; Adam Robinson¹; Francine Rice¹; Glenn Moore¹; Mitchell Meyer¹; ¹Idaho National Laboratory

9:25 AM

Development of Phase Constituents and Microstructure in Monolithic U-Mo Fuel Plate Assembly during Hot Isostatic Pressing: Youngjoo Park¹; Jongwon Kang¹; Dennis Keiser²; *Yongho Sohn*¹; ¹University of Central Florida; ²Idaho National Laboratory

9:40 AM

The Effect of Time, Temperature and Processing on the Microstructure Development in U-10 wt% Mo: Curt Lavender¹; *Vineet Joshi*²; Eric Nyberg²; Dean Paxton²; Doug Burkes²; ¹Pacific Northwest National Laboratory; ²PNNL

9:55 AM Break

10:10 AM Invited

High-density Fuel Development for High Performance Research Reactors at TUM: *Winfried Petry*¹; R Jungwirth¹; H-Y Chiang¹; T Zweifel¹; H Palancher²; ¹Technische Universität München (Munich University of Technology); ²CEA

10:35 AM Invited

Thermodynamics of U-Mo-Zr Alloys: Application to RERTR Nuclear Fuels: *Alexander Landa*¹; Patrice Turchi¹; Per Söderlind¹; ¹Lawrence Livermore National Laboratory

11:00 AM

Thermal Stability of Uranium-rich U-Mo Alloys for Advanced Nuclear Fuels: *Joseph McKeown*¹; Sangjoon Ahn²; Mark Wall¹; Luke Hsiung¹; Sean McDeavitt²; Patrice Turchi¹; ¹Lawrence Livermore National Laboratory; ²Texas A&M University

11:15 AM

Finite Element Analysis of the Rolling of U₁₀Mo Alloy: Parametric Study on Rolling Process Parameters: *Ayoub Soulami*¹; Curt Lavender¹; Dean Paxton¹; Douglas Burkes¹; ¹Pacific Northwest National Laboratories

11:30 AM

Elevated Temperature Compression Testing of the U-10 wt% Mo Alloy: Impact of Homogenization Treatments: *Curt Lavender*¹; Eric Nyberg²; Vineet Joshi²; Dean Paxton²; Doug Burkes²; ¹Pacific Northwest National Laboratory; ²PNNL

11:45 AM

On the Intermetallic Phases Formed between U, Pu-based Fuels and Fe-based Alloys: *Assel Aitkaliyeva*¹; Brandon Miller¹; James Madden¹; Thomas O'Holleran¹; Bulent Sencer¹; Rory Kennedy¹; ¹Idaho National Laboratory

Materials Processing Fundamentals — Thermodynamic

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: James Yurko, Materion Brush Beryllium and Composites; Lifeng Zhang, University of Science and Technology Beijing; Antoine Allanore, Massachusetts Institute of Technology; Cong Wang, Northwestern University

Monday AM
February 17, 2014

Room: 11B
Location: San Diego Convention Center

Session Chair: Guillaume Lamotte, Massachusetts Institute of Technology

8:30 AM

Thermodynamic Properties of Equilibrium Phases in the Ag-Cu-S System Below 500 K: Experimental Study: *Fiseha Tesfaye*¹; Pekka Taskinen¹; ¹Aalto University School of Chemical Technology

8:50 AM

Iron-Carbon Phase Diagram: A Century at Variance with Chemical Thermodynamics: *Helfried Näfe*¹; ¹University of Stuttgart

9:10 AM

Phase Relations for the Ce₂O₃-Al₂O₃-CaO System at Steelmaking Temperatures: *Ishii Makoto*¹; Morita Kazuki¹; ¹University of Tokyo

9:30 AM

Thermochemical Stability of Blue Ceramic Powders: *Henry A. Colorado*¹; J Posada²; Oscar Restrepo; Jenn-Ming Yang; ¹University of California, Los Angeles; ²University of California Los Angeles

9:50 AM

Effect of Water Vapor on S and P Distribution between Liquid Fe and MgO-Saturated Slag Relevant to a Flash Ironmaking Technology: *M. Yousef Mohassab-Ahmed*¹; Hong Yong Sohn; ¹University of Utah

10:10 AM Break

10:20 AM

FEM Simulations of Material Behavior during Stationary-shoulder Friction Stir Processing: *Ali Ammouri*¹; Ramsey Hamade¹; ¹American University of Beirut

10:40 AM

Microstructural and Mechanical Property Changes in a Friction Stir Processed Nanolamellar Cu-Nb Composite: *Josef Cobb*¹; John Carpenter²; Judy Schneider¹; ¹Mississippi State University; ²Los Alamos National Labs

11:00 AM

Numerical Analysis of Thermo-mechanical Behavior during Laser Cladding Process: *Tian Tang*¹; Sergio Felicelli¹; ¹University of Akron

11:20 AM

Surrogacy of the Be/AlSi Welding System: *Everett Criss*¹; Marc Meyers¹; ¹UCSD

Mechanical Behavior at the Nanoscale II — In Situ Nanomechanical Testing

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

Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Monday AM
February 17, 2014

Room: 9
Location: San Diego Convention Center

Session Chairs: Evan Ma, Johns Hopkins University; Andrew Minor, UC Berkeley & LBL

8:30 AM Invited

New In Situ TEM Techniques for Investigating Deformation Mechanisms in Small Volumes: *Andrew Minor*¹; ¹UC Berkeley & LBL

9:00 AM Invited

On the Occurrence of Deformation Twinning and Dislocation Plasticity in Small Scale Mg Samples: *Daniel Kiener*¹; Jiwon Jeong²; Markus Alfreider¹; Ruth Tremel¹; Sang Oh²; ¹University of Leoben; ²Pohang University of Science and Technology

9:30 AM

Elasticity and Plasticity of Submicron-sized Metallic Glasses: An In Situ TEM Study: *Lin Tian*¹; Zhi-Wei Shan¹; Evan Ma²; ¹CAMP-Nano, Xi'an Jiaotong University; ²Johns Hopkins University

9:50 AM

Experimental Test of Universality Over Boundary Conditions in Small Scale Mechanical Testing: *Robert Maass*¹; Matthew Wraith²; Peter Derlet³; Julia Greer¹; Karin Dahmen²; ¹California Institute of Technology; ²University of Illinois at Urbana Champaign; ³Paul Scherrer Institute

10:10 AM Break

10:30 AM Invited

Grain Boundary Dynamics in the Deformation of Nanocrystalline Metals: *David Srolovitz*¹; Siu Sin Quek²; Zhaoxuan Wu²; YongWei Zhang²; ¹University of Pennsylvania; ²Institute of High Performance Computing

11:00 AM

Temperature and Strain-rate Dependent Dislocation Nucleation in Pd Nanowhiskers: Lisa Chen¹; Soraya Terrab¹; Gunther Richter²; *Daniel Gianola*¹; ¹University of Pennsylvania; ²Max-Planck-Institute for Intelligent Systems

11:20 AM

In Situ Observations of Stress-Coupled Grain Boundary Migration in Nanocrystalline Metals: *Paul Rottmann*¹; Marc Legros²; Saritha Samudrala³; Frederic Mompou²; Kevin Henker¹; Julie Cairney³; ¹Johns Hopkins University; ²CEMES-CNRS; ³University of Sydney

11:40 AM

Fracture in Nanostructures with Pre-fabricated Notches: *X. Wendy Gu*¹; David Chen¹; Zhaoxuan Wu²; Yong-Wei Zhang²; David Srolovitz²; Julia Greer¹; ¹Caltech; ²Institute of High Performance Computing; ³University of Pennsylvania

Multiscale Approaches to Hydrogen-assisted Degradation of Metals — Overview of Key Issues & Research Directions

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

Program Organizers: Nicholas Winzer, Fraunhofer IWM; Matous Mrovec, Fraunhofer IWM; Brian Somerday, Sandia National Laboratories; Petros Sofronis, University of Illinois; David Bahr, Purdue University; Srinivasan Rajagopalan, ExxonMobil Research and Engineering Company

Monday AM
February 17, 2014

Room: 11A
Location: San Diego Convention Center

Session Chairs: Reiner Kirchheim, Universität Göttingen; William Gerberich, University of Minnesota

8:30 AM Invited

Connecting Hydrogen-enhanced Plasticity with the Fracture Mechanism: Megan Emigh¹; *Ian Robertson*²; Petros Sofronis¹; Kelly Nygren¹; Akihide Nagao³; May Martin¹; ¹University of Illinois; ²University of Wisconsin-Madison; ³JFE Steel Corporation

9:10 AM Invited

Measurement and Modeling of Hydrogen Environment Assisted Cracking in Monel K-500: *Richard Gangloff*¹; Hung Ha¹; James Burns¹; John Scully¹; ¹University of Virginia



9:50 AM Break

10:10 AM Invited

Hydrogen Embrittlement of Steels: New Observations and Modeling of Micromechanisms of Fracture: *Neeraj Thirumalai*¹; Srinivasan Rajagopalan²; Ju Li; ¹ExxonMobil Development Company; ²ExxonMobil Research and Engineering Company

10:50 AM Invited

Comparisons and Conflicts between Various Atomistic Models and between Models and Experimental Observations: Paul White¹; *Stan Lynch*¹; ¹Defence Science and Technology Organisation

11:30 AM

Modeling Dislocation Mediated Hydrogen Transport: *Mohsen Dadfarnia*¹; May Martin¹; Akihide Nagao²; Petros Sofronis¹; Ian Robertson³; ¹University of Illinois Urbana-Champaign; ²JFE Steel Corporation; ³University of Wisconsin-Madison

Nanostructured Materials for Rechargeable Batteries and Supercapacitors II — Session I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Energy Conversion and Storage Committee

Program Organizers: David Mitlin, University of Alberta and NINT NRC; Reza Shahbazian-Yassar, Michigan Technological University; Peter Kalisvaart, University of Alberta and NINT NRC

Monday AM
February 17, 2014

Room: Ballroom F
Location: San Diego Marriott Marquis & Marina

Session Chairs: David Mitlin, University of Alberta; Reza Shahbazian-Yassar, Michigan Technological University

8:30 AM Invited

Se-based Positive Electrode Material for Rechargeable Battery Applications: *Ali Abouimrane*¹; Yanjie Cui¹; Khalil Amine¹; ¹Argonne National Laboratory

8:45 AM Invited

Why Do Graphene Anodes Offer Superior Energy Densities as Compared to Graphitic Anodes in Li-ion Batteries?: *Nikhil Koratkar*¹; ¹Rensselaer Polytechnic Institute

9:00 AM Invited

Stress Effect on Charge and Discharge Rate and Energy Efficiency of Li-alloy Electrodes: Yifan Gao¹; *Min Zhou*¹; ¹Georgia Institute of Technology

9:15 AM Invited

In Situ Aberration-corrected Scanning Transmission Electron Microscopy of Anode Materials for Li Ion Batteries: *Reza Shahbazian-Yassar*¹; ¹Michigan Technological University

9:30 AM Invited

Complexion Engineering of Batteries and Solid-state Electrolytes: Jiajia Huang¹; Mojtaba Samiee¹; *Jian Luo*¹; ¹UC San Diego

9:45 AM Invited

Understanding and Controlling the SEI in Li Ion Batteries: *Andrew Gewirth*¹; Hadi Tavassol¹; ¹University of Illinois

10:00 AM Break

10:15 AM Invited

Application of In Situ ec-S/TEM for Energy Storage Research: *Raymond Unocic*¹; Robert Sacchi¹; Nancy Dudley¹; Karen More¹; ¹Oak Ridge National Laboratory

10:30 AM Invited

Composite Silicon Carbon Nano-fiber Anode for High Energy Advance Lithium Batteries: *Gholam-Abbas Nazri*¹; Maryam Nazri¹; ¹Frontier Applied Sciences and Technologies, LLC

10:45 AM Invited

Challenges in Developing High Energy Density Li-ion Batteries with High Voltage Cathodes: *Taiquan Jow*¹; Jan Allen¹; Oleg Borodin¹; Samuel Delp¹; Joshua Allen¹; ¹Army Research Laboratory

11:00 AM Invited

First Principles Investigation on the Lithiation Behavior of Nanostructured Silicon-based Alloys and Composites: Chia-Yun Chou¹; *Gyeong Hwang*¹; ¹University of Texas at Austin

11:15 AM Invited

Nano-structured Lithium Battery Electrode Materials via Aerosol Assisted Synthesis: *Juchen Guo*¹; ¹University of California, Riverside

11:30 AM Invited

Nanoporous Silicon Networks as Anodes for Lithium Ion Batteries: *Jia Zhu*¹; Xiang Zhang¹; ¹UC Berkeley

11:45 AM Invited

Design of Nano/Microstructures for Highly Stable and Active Electrodes for Lithium Batteries: *Xiao-Dong Zhou*¹; FuSheng Ke¹; Ling Huang²; Juntao Li²; Shi-Gang Sun²; ¹University of South Carolina; ²Xiamen University

Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World — Diffraction Centennial - Historic Perspective and Future Challenges

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

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kosterz, ETH; Brent Fultz, California Institute of Technology; Peter Liaw, The University of Tennessee

Monday AM
February 17, 2014

Room: 10
Location: San Diego Convention Center

Session Chairs: Rozaliya Barabash, ORNL; Gernot Kosterz, ETH

8:30 AM Introductory Comments

8:40 AM Keynote

Local Structure in Wüstite, Fe_{1-x}O, by Single Crystal Diffuse Scattering and PDF Analysis: *Richard Welberry*¹; Darren Goossens¹; ¹Australian National University

9:20 AM Invited

A Case Study in Future Energy Challenges: Towards In Situ Hard X-ray Microscopy of Photovoltaic Systems: *Jörg Maser*¹; Barry Lai¹; Ross Harder¹; Tonio Buonassisi²; Mariana Bertoni³; ¹Argonne National Laboratory; ²Massachusetts Institute of Technology; ³Arizona State University

9:45 AM Invited

Neutron Scattering Studies of the Advanced Multi-phases Steels at HANARO: *Baek Seok Seong*¹; Apichate Maneewong¹; Eun Joo Shin¹; Young-Soo Han¹; Wan Chuck Woo¹; Kye Hong Lee¹; Eun-Young Kim²; Shi-Hoon Choi²; ¹KAERI; ²Sunchon National Univ.

10:10 AM Break

10:20 AM Invited

New Roles for Small-angle X-ray and Neutron Scattering in Real-time Crystallography of Processes in Technological Materials: *Andrew Allen*¹; Fan Zhang¹; Lyle Levine¹; Jan Ilavsky²; ¹NIST; ²Argonne National Laboratory

10:45 AM Invited

A New High Energy Beamline at the Cornell High Energy Synchrotron Source: *Matthew Miller*¹; Jay Schuren²; Ernest Fontes¹; Darren Dale¹; Margaret Koker¹; Peter Ko¹; Paul Shade²; Todd Turner²; ¹Cornell University; ²Air Force Research Laboratory

11:10 AM Invited

Analyzing Diffraction Data in the 21st Century: *Brian Toby*¹; Robert Von Dreele¹; ¹Argonne National Lab

11:35 AM Invited

In Situ Neutron Diffraction during Multi-axial Deformation: *Steven Van Petegem*¹; Helena Van Swygenhoven¹; Julia Repper¹; Werner Wagner¹; ¹Paul Scherrer Institut

Pb-free Solders and Emerging Interconnect and Packaging Materials — High Temperature Environments

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch Automotivve

Monday AM
February 17, 2014

Room: 5B
Location: San Diego Convention Center

Session Chairs: Fay Hua, Intel Corporation; Thomas Bieler, Michigan State University

8:30 AM

Development of Pb-free Composite Solder Paste to Replace High-Pb Hierarchical Solders: *Iver Anderson*¹; Kathlene Lindley; ¹Ames Laboratory

8:50 AM

Effect of Cr and Ca Alloying Elements on the Solder Joint Reliability in Sn-0.7Cu System for High-temperature Automotive Electronics: *Won Sik Hong*¹; A Young Kim¹; ¹Korea Electronics Technology Institute(KETI)

9:10 AM

The Performance of Hypereutectic Sn-Cu Pb-free Solder in Elevated Temperature Service: *Takatashi Nishimura*¹; Keith Sweatman¹; ¹Nihon Superior

9:30 AM

Eutectic Al-Ge Thin Film for High-temperature Bonding: *Chia-Hao Chang*¹; Po-Chen Lin¹; Albert T. Wu¹; ¹National Central University

9:50 AM

The Effect of Cr Addition on the Wetting Behavior on Cu of High Temperature Zn₂₅Sn_{0.15}A_{10.1}Ga-xCr Pb-free Solder: *Chin-Wei Liu*¹; Kwang-Lung Lin¹; ¹National Cheng Kung University

10:10 AM Break

10:30 AM

NanoCopper based Solder-free Electronic Assembly: Alfred Zinn¹; Karl Schnabl²; Luke Wentlent²; Debora Schmitz²; Kevin Mootoo²; Jenai Beddow¹; Ed Hauptfleisch³; Daniel Blass³; *Peter Borgesen*²; ¹Lockheed Martin Space Systems Company; ²Binghamton University; ³Lockheed Martin Mission Systems & Training

10:50 AM

Pressureless Bonding Using Cu and Sn Nanoparticles: *Toshitaka Ishizaki*¹; Ryota Watanabe¹; ¹Toyota Central R&D Laboratories, Inc.

11:10 AM

Mechanical Properties of Sintered Ag as a New Material for Die Bonding: Influence of the Elaboration Porosity: Vincenzo Caccuri¹; *Xavier Milhet*¹; Pascal Gadaud¹; Denis Bertheau¹; Michel Gerland¹; ¹Prime Institute UPR CNRS 3346

11:30 AM

Pressure-less Si Wafer Bonding Using Sputtered Ag Thin Films: *Chulmin Oh*¹; Shijo Nagao¹; Katsuaki Sugauma¹; ¹ISIR, Osaka University

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIII — Interfacial Reactions of the Pb-free Solder Joints

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Chao-hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikuo Ohnuma, Tohoku University; Clemens Schmetterer, Forschungszentrum Juelich GmbH.; Yee-Wen Yen, National Chung Cheng University; Shien Ping Feng, The University of Hong Kong; Shih-Kang Lin, National Cheng Kung University

Monday AM
February 17, 2014

Room: 32B
Location: San Diego Convention Center

Session Chairs: Chao-Hong Wang, National Chung Cheng University; Yee-wen Yen, National Taiwan University of Science and Technology

8:30 AM Invited

Suppression of Cu₃Sn in High Cu Content Pb-free Solders: *Kazuhiro Nogita*¹; Stuart McDonald¹; Guang Zeng¹; Jonathan Read¹; Takatoshi Nishimura²; ¹The University of Queensland; ²Nihon Superior Co. Ltd.

8:50 AM

Interfacial Reactions between Sn and Ni-xW Alloys: *Chao-Wei Chiu*¹; Yee-Wen Yen¹; ¹National Taiwan University of Science & Technology

9:10 AM

Interfacial Reaction and Mechanical Characterization of Sn-Ag-Cu/Au/Pd(P)/Cu Solder Joints: Thick Pd(P) Case: *Hsin-Hui Hua*¹; Shih-Ju Wang¹; Tsai-Tung Kuo¹; Cheng-En Ho¹; ¹Yuan Ze University

9:30 AM

Influence of Ni/Zn on the Interfacial Reactions between Sn-0.7Cu Solder and Cu Substrates: *Guang Zeng*¹; Stuart McDonald¹; Qinfen Gu²; Hideyuki Yasuda³; Yasuko Terada⁴; Kazuhiro Nogita¹; ¹The University of Queensland; ²The Australian Synchrotron; ³Kyoto University; ⁴Japan Synchrotron Radiation Research Institute

9:50 AM

Channel Formation in Cu₆Sn₅ and Cu₃₅n Layers during Reflowing: *Wei-Lan Chiu*¹; Chien-Min Liu¹; Yi-Sa Huang¹; Chih Chen¹; ¹National Chiao Tung University

10:10 AM Break

10:30 AM Invited

Kinetics of Reactive Diffusion between Co and Sn at Solid-state Temperatures: *Masanori Kajihara*¹; Minh O¹; ¹Tokyo Institute of Technology

10:50 AM

Interfacial Reactions of Sn-Zn Solders with Pd and Au/Pd/Ni Substrates: *Chao-hong Wang*¹; Po-yi Li¹; Chun-wei Chiu¹; ¹National Chung Cheng University

11:10 AM

Microstructure and Phase Transformation of Cu-Sn Intermetallics in Microbumps: Cheng-En Ho¹; Ling-Huang Hsu¹; Hsin-Hui Hua¹; *Shih-Ju Wang*¹; ¹Yuan Ze University

11:30 AM

Interfacial Reactions between Sn-4Ag-0.5Cu Solder and Ni-coated Bi₂Te₃ Substrate: *Chih Fan Lin*¹; Shien Ping Tony Feng²; Nga Yu Hau²; Chih Ming Chen¹; ¹National Chung Hsing University; ²University of Hong Kong



Phase Transformation and Microstructural Evolution — Carbon Redistribution in Steels I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Monday AM Room: 31C
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Mohamed Gouné, Université Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC)

8:30 AM Invited

Modeling of Carbon Diffusion in Fe-C Martensite Phase: *Helena Zapolsky*¹; Mykola Lavrskyi¹; Marilyne Certain¹; Frédéric Danoix¹; Armen Khachaturyan²; ¹University of Rouen; ²University of Rutgers

9:00 AM

Carbon Ordering in Ferrite: Stability and Diffusion by Atomistic Simulation in High-carbon Ferrite: *Benjamin Lawrence*¹; Chad Sinclair¹; Michel Perez²; ¹University of British Columbia; ²INSA-Lyon

9:20 AM

Decomposition of Cementite under Strain in Pearlitic Steels: An Ab Initio Study: *Ali Nemaollahi*¹; Blazej Grabowski¹; Dierk Raabe¹; Jörg Neugebauer¹; ¹Max-Planck Institute for Iron Research

9:40 AM Invited

Contribution of Synchrotron X-ray Diffraction to the Study of the Phase Transformation in Metallic Alloys: *Moukrane Dehmas*¹; Elisabeth Aebly-Gautier¹; Benoit Appolaire²; Benoit Denand¹; Guillaume Geandier¹; Sabine Denis¹; ¹Institut Jean Lamour; ²ONERA/LEM

10:10 AM Break

10:25 AM Invited

Redistribution of Carbon in Steel – Perspectives Using Atom Probe Tomography: *Ross Marceau*¹; Michael Herbig²; Ivan Gutierrez-Urrutia²; Pyuck-Pa Choi²; Dierk Raabe²; ¹Deakin University; ²Max-Planck-Institut für Eisenforschung

10:55 AM

Atom Probe Tomography Investigation of C Redistribution in Sub-zero Ms FeNiC Martensites: *Frederic Danoix*¹; Mohamed GOUNE²; Sebastien ALLAIN³; ¹CNRS - Université de Rouen; ²University of Bordeaux; ³ArcelorMittal

11:15 AM Invited

Carbon Enrichment in Austenite during Ferrite Transformation and Austenite Reversion: *Goro Miyamoto*¹; ZhenQing Liu¹; Naoki Takayama²; Tadashi Furuhashi¹; ¹Tohoku University; ²JFE Steel Corporation

11:45 AM

Microstructural Development at the Nanoscale in Quench and Tempered 4340 Steel: *Amy Clarke*¹; Michael Miller²; Robert Field¹; Paul Gibbs¹; Kester Clarke¹; David Alexander¹; Kathy Powers¹; Daniel Coughlin¹; George Krauss³; ¹Los Alamos National Laboratory; ²Oak Ridge National Lab; ³Colorado School of Mines

12:05 PM

Precipitation Sequence in a Dual Precipitation Medium Carbon Martensitic Steel Aged at 500°C: *Frederic Danoix*¹; Raphaële Danoix²; Denis Delagnes³; ¹CNRS - Université de Rouen; ²Normandy University; ³Institut Clement ADER

Progress Towards Rational Materials Design in the Three Decades Since the Invention of the Embedded Atom Method: An MPMD Symposium in Honor of Dr. Michael I Baskes — Recent Advances in Interatomic Potentials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Srinivasan Srivilliputhur, University of North Texas; Amit Misra, Los Alamos National Laboratory; Neville Moody, Sandia National Laboratories; Stephen Foiles, Sandia National Laboratories; Mark Asta, University of California; Alan Needleman, University of North Texas

Monday AM Room: 30E
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Amit Misra, Los Alamos National Laboratory; Alan Needleman, University of North Texas; Srinivasan Srivilliputhur, University of North Texas

8:30 AM Keynote

A History Of The Embedded Atom Method: *Michael Baskes*¹; ¹UCSD

9:00 AM Keynote

Importance of Directional Bonding in Studies of Screw Dislocations in BCC Transition Metals: *Vaclav Vitek*¹; Roman Gröger²; ¹University of Pennsylvania; ²Institute of Physics of Materials, Academy of Sciences of the Czech Republic

9:30 AM Invited

A Parameterized Interatomic Potential for Saturated Hydrocarbons Using the Modified Embedded-atom Method: *Sasan Nouranian*¹; Michael Baskes²; Mark Tschoop³; Steven Gwaltney¹; Mark Horstemeyer¹; ¹Mississippi State University; ²University of California, San Diego; ³US Army Research Laboratory

9:50 AM Invited

Interatomic Potentials for Metallic Systems: Recent Progress and Applications: *G. P. Purja Pun*¹; *Y. Mishin*¹; ¹George Mason University

10:10 AM Break

10:20 AM Invited

Interatomic Forces in Iron: *Graeme Ackland*¹; ¹University of Edinburgh

10:40 AM Invited

Modelling Carbon with Transferable Empirical Potentials: *Nigel Marks*¹; ¹Curtin University

11:00 AM Invited

Predicting Interfacial Interactions and Surface Chemistry Using Charge Optimized Many-body (COMB) Potentials: *Susan Sinnott*¹; Tao Liang¹; Yu-Ting Cheng¹; Simon Phillpot¹; ¹University of Florida

11:20 AM Invited

MEAM with Charge Transfer for TM Oxide Modeling: *Fantai Kong*¹; Hengji Zhang¹; Roberto Longo¹; Byeongchan Lee²; *Kyeongjae Cho*¹; ¹UT Dallas; ²Kyung Hee University

11:40 AM Invited

Ensuring Reliability, Reproducibility and Transferability in Atomistic Simulations: The Knowledgebase of Interatomic Models (openKIM.org): *Ellad Tadmor*¹; Ryan Elliott¹; ¹University of Minnesota

Rare Metal Extraction & Processing Symposium — Metalloids and Rare Extraction Process

Sponsored by: Associação Brasileira de Metalurgia, Materiais e Mineração – ABM, Chinese Society for Metals, Metallurgy and Materials Society of CIM, Institute of Materials, Minerals and Mining, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Neale Neelameggham, Ind LLC; Shafiq Alam, Memorial University of Newfoundland; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto, Kennecott Utah Copper Refinery

Monday AM Room: 16B
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Shafiq Alam, Memorial University of Newfoundland; Katsutoshi Inoue, Saga University

8:30 AM Introductory Comments

8:40 AM

2014 EPD Distinguished Lecture: How Critical is Recycling for Critical Materials' Sustainability?: *Brajendra Mishra*¹; ¹Colorado School of Mines

9:20 AM

Adsorptive Recovery of Antimony (III, V) Using Metal-loaded Orange Juice Residue: *Katsutoshi Inoue*¹; Jun-ichi Inoue¹; Shafiq Alam²; ¹Saga University; ²Memorial University

9:40 AM

The Synthesis and Stability of Yukonite: Implications in Solid Arsenical Waste Storage: *Matthew Bohan*¹; George Demopoulos¹; John Mahoney²; ¹McGill University; ²Mahoney Geochemical Consulting LLC

10:00 AM Break

10:20 AM

The Evolving Copper-Tellurium Byproduct System: A Review of Extraction & Processing Technologies: *Michele Bustamante*¹; Gabrielle Gaustad¹; ¹Rochester Institute of Technology

10:40 AM

Conversion of Strontium Sulfate to Strontium Oxalate in Solutions Containing Ammonium Oxalate as Reactant: *Mert Zoraga*¹; *Cem Kahruman*¹; Ibrahim Yusufoglu¹; ¹Istanbul University

11:00 AM

Electrodeposition of Zinc from Zinc Oxide Using Urea and Choline Chloride Mixture: Effect of Process Variables on Current Efficiency, Energy Consumption, and Surface Morphology: *Haoxing Yang*¹; Ramana Reddy¹; ¹The University of Alabama

11:20 AM

Effect of Physical Parameters on the Stirred Separation Process in Rare Earth Extraction System: *Wang Shuchan*¹; Zhang Ting'an¹; Zhang Zimu¹; Zhao Qiuyue¹; Liu Yan¹; Lv Chao¹; ¹Northeastern University

11:40 AM

Slurry Electrolysis of As-rich Antimonic Gold Concentrate Ores: *Chengyan Wang*¹; Yongqiang Chen¹; Yongqiang Yang¹; Yonglu Zhang¹; Baozhong Ma¹; ¹Beijing General Research Institute of Mining and Metallurgy

Solid-state Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment — Mechanical Properties

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Xiang-Yang Liu, Los Alamos National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Stephen Foiles, Sandia National Laboratories; Mitra Taheri, Drexel University; Rampi Ramprasad, University of Connecticut

Monday AM Room: 6D
February 17, 2014 Location: San Diego Convention Center

Session Chair: Xiang-Yang (Ben) Liu, Los Alamos National Laboratory

8:30 AM Invited

Designing Interfaces for Maximum Strength, Deformability and Toughness in Metal-ceramic Nanocomposites: *Amit Misra*¹; ¹Los Alamos National Laboratory

9:10 AM Invited

Viscoelasticity of Stepped Interfaces: *Michael Demkowicz*¹; Scott Skirlo¹; ¹Massachusetts Institute of Technology

9:50 AM

A Study of Interfacial Sliding in Cu/Nb Bicrystals: *Jason Mayeur*¹; Irene Beyerlein¹; Curt Bronkhorst¹; ¹Los Alamos National Laboratory

10:10 AM Break

10:20 AM

Environment-dependent Interfacial Strength Using First Principles Thermodynamics: The Example of the Pt-HfO₂ Interface: *Yenny Cardona-Quintero*¹; Ganpati Ramanath²; *Rampi Ramprasad*¹; ¹University of Connecticut; ²RPI

10:40 AM

Interfacial Migration and Deformation during Indentation-induced Grain Growth of Nanocrystalline Nickel: *Garritt Tucker*¹; Stephen Foiles²; ¹Drexel University; ²Sandia National Laboratories

11:00 AM

Atomic Scale Investigation of Grain Boundary Structure role on Deformation and Crack Growth Dynamics in Aluminum: *Ilaksh Adlakha*¹; Kiran Solanki¹; Mark Tschopp²; ¹Arizona State University; ²Army Research Laboratory

11:20 AM

Conditions for Mechanical Equilibrium of a 4-Node in the Interfacial Network in 3D: *Vasily Bulatov*¹; Bryan Reed¹; Jeremy Mason¹; Mukul Kumar¹; ¹LLNL

Ultrafine Grained Materials VIII — Keynote Session

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Lavernia, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuning Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Monday AM Room: 6E
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Suveen Mathaudhu; Yuntian Zhu, North Carolina State University; Yuri Estrin, Monash University

8:30 AM Invited

Breakdown of Hall-Petch Strengthening for UFG Metals at Elevated Temperatures: *Martin Heilmaier*¹; Joachim H. Schneibel²; Daniel Schliephake¹; ¹Karlsruhe Institute of Technology; ²Formerly Oak Ridge National Laboratory



8:50 AM Invited

Dislocation Hardening Versus Softening: Size Effect: *Xiaoxu Huang*¹; ¹Technical University of Denmark

9:10 AM Invited

Grain Boundaries and Advanced Properties of Ultrafine-grained Metals: *Ruslan Valiev*¹; ¹Ufa State Aviation Technical University

9:30 AM Invited

Microstructural Evolution and Superplastic Behavior in Two-phase Alloys Processed by High-pressure Torsion: *Megumi Kawasaki*¹; *Terence Langdon*²; ¹Hanyang University; ²Univ of Southern California

9:50 AM Invited

Grain Boundaries in Severely Deformed Metals: Effect of Deformation Temperature and Stacking Fault Energy: *Sergii Divinsky*¹; ¹University of Münster

10:10 AM Break

10:25 AM Invited

Insight into Microstructural Evolution during Severe Plastic Deformation Processes Gained from In Situ Microscopy: *Mitra Taheri*¹; ¹Drexel University

10:45 AM Invited

Nanocrystalline Grain Boundary Engineering Enabled by Novel Deformation Physics: *Timothy Rupert*¹; ¹University of California, Irvine

11:05 AM Invited

Recent Developments in Grain Refinement Modeling during Severe Plastic Deformation: *Laszlo Toth*¹; *Chengfan GU*²; ¹Université de Lorraine; ²The University of New South Wales

11:25 AM Invited

Microstructural Design of Ultrafine Grained Magnesium Alloys through Severe Thermo-mechanical Processing: *Ibrahim Karaman*¹; *E. Dogan*¹; *K. Ted Hartwig*¹; ¹Texas A&M University

11:45 AM Invited

New Insights into the Formation of Solute Nanostructures in an Al-Mg-Si Alloy during HPT Processing: *Gang Sha*¹; *Xiaozhou Liao*¹; *Ruslan Valiev*²; *Maxim Murashkin*²; *Simon Ringer*¹; ¹The University of Sydney; ²Ufa State Aviation Technical University

12:05 PM

Application of High-pressure Torsion to TiFe Hydrogen Storage Material: No Requirement for Activation: *Kaveh Edalati*¹; *Junko Matsuda*¹; *Makoto Arita*¹; *Takeshi Daio*¹; *Hideaki Iwaoka*¹; *Shoichi Toh*¹; *Etsuo Akiba*¹; *Zenji Horita*¹; ¹Kyushu University

2014 Functional Nanomaterials: Synthesis, Properties and Applications — Nanomanufacturing II & Fabrication and Fundamentals I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Nanomaterials Committee

Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Monday PM
February 17, 2014

Room: Ballroom D
Location: San Diego Marriott Marquis & Marina

Session Chairs: Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Nitin Chopra, The University of Alabama

2:00 PM

Production of Zirconia Nanofibers Using Electrospinning Method: *Durgha Rajamanikkam*¹; ¹Anna University

2:20 PM

Rapid Synthesis and Annealing System for ZnO Thin Films Using Inductively Coupled Thermal Plasma: *Michael Kinsler*¹; *Rabiah Harrison*¹; *Kyle Ng*¹; *Kwok-Siong Teh*¹; ¹San Francisco State University

2:40 PM

Synthesis of Monolithic Iron Incorporated Silica Aerogels by Ambient Pressure Drying: *Xuan Cheng*¹; *Fengzuan Luo*¹; *Zaidong Shao*¹; *Ying Zhang*¹; ¹Xiamen University

3:00 PM

Ultrahigh Aspect-ratio Nano-gratings of Ti-Al Alloy Fabricated by a Combined Top-down Bottom-up Approach: *Yuichiro Koizumi*¹; *Daixiu Wei*¹; *Akihiko Chiba*¹; *Akinori Yamanaka*²; *Masahiko Yoshino*³; *Hiroaki NISHIYAMA*⁴; ¹Tohoku University; ²Tokyo University of Agriculture and Technology; ³Tokyo Institute of Technology; ⁴Yamagata University

3:20 PM

Novel Synthesis of Nanostructured Hairy Aluminum/AlOOH Core-shell Particles: *Jiaquan Xu*¹; *Marc Estruga*¹; *Lianyi Chen*¹; *Hongseok Choi*¹; *Xiaochun Li*¹; ¹University of Wisconsin-Madison

3:40 PM Break

4:00 PM

Synthesis of Ultrahigh-density Sub 10 nm Co Nanowires Arrays by the Method of Phase Separation: *Yuan Tian*¹; *Pinaki Mukherjee*¹; *Tanjore Jayaraman*¹; *Zhanping Xu*¹; *Jeffrey Shield*¹; *Chad Briley*¹; *Daniel Schmidt*¹; *Li Tan*¹; *Mathias Schubert*¹; ¹University of Nebraska-Lincoln

4:20 PM

A Simple Green Synthesis of Type II Water Soluble CdTe/CdS Core Shell Nanoparticles: *Oluwafemi Oluwatobi*¹; *Olamide Daramola*¹; *Anda Tywabi*¹; *Sandile Songca*¹; ¹Walter Sisulu University

4:40 PM

Ag Nanostructures with Various Morphologies Fabricated through Facile Wet-chemical Synthesis: *Ping Yang*¹; *Yulan Zhang*¹; ¹University of Jinan

5:00 PM

Electrochemical Oxidation of Ethanol on Mesoporous NiO Fibers in Alkaline Media: *Jing Zhan*¹; *Meng Cai*¹; *Chuanfu Zhang*¹; *Chen Wang*¹; ¹Central South University

5:20 PM

Effect of Co Substitution on Microwave Absorption of BaFe₁₂O₁₉: *Abhishek Kumar*¹; *Vijaya Agarwala*¹; *Dharmendra Singh*¹; ¹IIT Roorkee

2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications — Keynote Session on Nanomaterials and Applications

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Nugehalli Ravindra, New Jersey Institute of Technology; Ramki Kalyanaraman, University of Tennessee; Haiyan Wang, Texas A&M University; Yuntian Zhu, North Carolina State University; Justin Schwartz, North Carolina State University; Amit Goyal, Oak Ridge National Laboratories

Monday PM
February 17, 2014

Room: Ballroom E
Location: San Diego Marriott Marquis & Marina

Session Chairs: Ke Lu, Institute of Metal Research; Dieter Wolf, Argonne National Laboratory

2:00 PM Keynote

Colossal Injection of Catalyst Atoms into Epitaxial Silicon Nanowires:

David Seidman¹; Oussama Moutanabbir²; Dieter Isheim¹; Horst Blumtritt³; Stephan Senz³; Eckhard Pippel³; ¹Northwestern University; ²Ecole Polytechnique de Montreal; ³Max Planck Institute of Microstructure Physics

2:20 PM Keynote

Solidification Mechanisms of Carbon as Graphene, Graphite and Diamond from Metal-carbon Melts: Reza Abbaschian¹; Shaahin Amini¹; ¹University of California, Riverside

2:40 PM Keynote

Hierarchical Microstructural Architecture for High-performance Thermoelectrics: Vinayak Dravid¹; ¹Northwestern University

3:00 PM Keynote

Coarsening of Nanoscale Precipitates in Al-Li Alloys: Martin Glicksman¹; Ke-gang Wang¹; Ben Pletcher²; ¹Florida Institute of Technology; ²Select Arc Corp.

3:20 PM Break

3:40 PM Keynote

Fundamentals of Ion-solid Interactions in Ceramic and Structural Materials: Steven Zinkle¹; ¹Oak Ridge National Laboratory

4:00 PM Keynote

Plastic Deformation in Nanoindentation of a BCC Metal: Marc Meyers¹; Carlos Ruestes¹; Tane Remington¹; Eduardo Bringa²; Bruce Remington³; Bimal Kad¹; ¹UCSD; ²CONICET/U. Nacional de Cuyo; ³LLNL

4:20 PM Keynote

Strengthening of Steels by Nanodispersoids: G Sundararajan¹; R Vijay¹; ¹ARCI

4:40 PM Keynote

Role of Dislocations during Processing and Deformation of Nanocrystalline Materials: Farghalli Mohamed¹; ¹University of California, Irvine

5th International Symposium on High Temperature Metallurgical Processing — Alloy and 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; Mark Schlessinger, Missouri University of Science and Technology; Onuralp Yücel, ITU; Rafael Padilla, University of Concepcion; Phillip Mackey, P.J. Mackey Technology; Guifeng Zhou, Wuhan Iron and Steel

Monday PM
February 17, 2014

Room: 18
Location: San Diego Convention Center

Session Chairs: Onuralp Yücel, ITU; Tobias Dubberstein, Institute of Iron and Steel Technology

2:00 PM Introductory Comments

2:05 PM

A Refinement Study of SHS Alloys by Mini Vacuum Arc Melting System: Murat Alkan¹; Seref Sonmez¹; Bora Derin¹; Onuralp Yucel¹; ¹Istanbul Technical University

2:20 PM

An Investigation on the Self-propagating High Temperature Synthesis of TiB₂: Onuralp Yucel¹; Mehmet Bugdayci¹; Ahmet Turan¹; ¹Istanbul Technical University

2:35 PM

Characteristics of Solidification Structure of Wide-thick Slab of Steel Q345: Sen Luo¹; Miaoyong Zhu¹; Weiling Wang¹; Shuguo Zheng¹; Fan Xu¹; ¹Northeastern University

2:50 PM

Determination of Surface Tension for FeCrMnNi Alloy with Varying Sulfur and Phosphorus Relevant to Gas Atomization: Tobias Dubberstein¹; Hans-Peter Heller¹; ¹TU Bergakademie Freiberg

3:05 PM

Behavior Analysis of Ag in Ag-Sn-Zn Alloy: Guang-yao Xu¹; Yang Tian¹; Da-chun Liu¹; Bin Yang¹; Bao-qiang Xu¹; ¹Kunming University of Science and Technology

3:20 PM

Effects of Zirconium Content on Nano Inclusion Morphology of Hull Structure Steel Plate during the High Heat Input Welding: Guoli Liang¹; Shaoqiang Yuan¹; Huibin Wu²; ¹Tangshan College; ²National Engineering Research Center for Advanced Rolling Technology

3:35 PM Break

3:45 PM

Electrochemical Synthesis of TiC-transition Metal-based Complex Powder in Molten Chloride: Qian Xu¹; Qiu-Shi Song¹; Lin Sun¹; Liang Xu¹; ¹Northeastern University

4:00 PM

Electrolysis Contribution to the Yield of Alloy Elements and the Exchange Current Density of Manganese and Chromium during DC-Arc Steel Melting/Refining Process: Jianbin Chen¹; Mao-fa Jiang²; ¹Shanghai Institute of Technology; ²School of Materials and Metallurgy, Northeastern University

4:15 PM

Experimental Study of the Thermodynamics of the Fe-Nb-C Melts: Baijun Yan¹; Dongdong Guo¹; Lu Zhang¹; Jiayun Zhang¹; ¹University of Science and Technology Beijing

4:30 PM

Influence of Rapid Cooling on Structure and Performance of Niobium Containing Steels: Banglun Wang¹; Fenglian Wang²; ¹College of Materials Science and Engineering of Chongqing University; ²School of Economics and Business Administration, Chongqing University



4:45 PM

Preparation of Nitrogenous Ferrovandium by Gaseous Nitriding in the Liquid Phase Ferrovandium: *Wenjuan Liu*¹; Kai Dong¹; Rong Zhu¹; ¹University of Science and Technology Beijing

5:00 PM

Study on Key Technologies of 38CrMoAl Steel Produced by BOF-LF-RH-CC Process: *Yong Chen*¹; Min Zhang²; Jian-hua Zeng²; Hong Pan²; ¹PANsteel Group Research Institute Co., Ltd.; ²PANsteel Group Research Institute Co., Ltd.

5:10 PM

The Evolution and Morphology of Sulfide Inclusions in 95CrMo Hollow Steel: *Jing Chen*¹; Shaobo Zheng¹; Chuanjie Cai¹; Yongqiu Liu¹; Huigai Li¹; Jieming Yang²; ¹Shanghai University; ²Shougang Guiyang Special Steel

5:20 PM

Electrochemically Preparing of Ni-Fe Alloys in Molten Sodium Hydroxide: *Jianbang Ge*¹; Jiusan Xiao¹; Shuqiang Jiao¹; Hongmin Zhu¹; ¹University of Science and Technology Beijing

A Lifetime of Experience with Titanium Alloys: An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer — Williams Honorary Session II: Fatigue I

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Adam Pilchak, Air Force Research Laboratory; James Larsen, Air Force Research Laboratory; David Dye, Imperial College London; Jay Tiley, Air Force Research Laboratory

Monday PM Room: 1A
February 17, 2014 Location: San Diego Convention Center

Session Chairs: George Gray, Los Alamos National Laboratory; Peter Collins, University of North Texas

2:00 PM Invited

The Response of Ti-alloys to Extreme Loading Environments: *George Gray*¹; ¹Los Alamos National Laboratory

2:30 PM Invited

Creep and Fatigue of Titanium Alloys: Mechanisms and Microstructure-based Modeling: Matthew Brandes¹; Adam Pilchak²; Stan Rokhlin¹; Somnath Ghosh³; *Michael Mills*¹; ¹The Ohio State University; ²Air Force Research Laboratories; ³Johns Hopkins University

3:00 PM

TriBeam Tomography of Ti6-4 for Plasticity Characterization: *McLean Echlin*¹; Jean-Charles Stinville¹; Euan Wielewski²; Paul Dawson²; Matthew Miller²; Tresa Pollock¹; ¹UC Santa Barbara; ²Cornell University

3:20 PM

Mechanisms of Damage Accumulation during Superelastic Cycling of Metastable Beta Titanium Alloys: *Vassili Vorontsov*¹; Nicholas Jones²; Khandaker Rahman¹; Oliver Joris¹; David Dye¹; ¹Imperial College London; ²University of Cambridge

3:40 PM Break

4:00 PM Invited

Fatigue Characteristics and Microstructures of Laser- and Non-laser Welded Low Cost Ti-4.5Al-2.5Cr-1.2Fe-0.1C for Use in Next Generation Aircrafts: *Mitsuo Niinomi*¹; Masaaki Nakai¹; Junko Hieda¹; Ken Cho¹; Yoshio Itsumi²; Shogo Murakami²; Hideo Oyama²; Wataru Abe³; ¹Tohoku University; ²Kobe Steel, Ltd.; ³Kawasaki Heavy Industries, Ltd.

4:30 PM Invited

Multi-time Scaling Image Based Crystal Plasticity FE Models Dwell Fatigue Initiation in Polycrystalline Ti Alloys: *Somnath Ghosh*¹; Michael Mills²; Stan Rokhlin²; Jim Williams²; ¹Johns Hopkins University; ²The Ohio State University

5:00 PM

Reducing Uncertainties in Life Limits of Titanium Alloys in Turbine Engine Rotors: *James Larsen*¹; Sushant Jha²; Christopher Szczepanski¹;

Reji John¹; Andrew Rosenberger¹; Michael Caton¹; Patrick Golden¹; Dennis Buchanan³; Jay Jira¹; ¹Air Force Research Laboratory; ²UTC; ³University of Dayton Research Institute

5:20 PM

Combined Experimental and Computational Modeling to Understand the Role of Microstructure on Fatigue Behavior of Ti-6Al-2Sn-4Zr-2Mo-0.08Si: *Christopher Szczepanski*¹; Adam Pilchak¹; Sushant Jha²; Reji John¹; James Larsen¹; ¹US Air Force Research Laboratory; ²UTC/AFRL

5:40 PM

MD Simulations of Dislocation Nucleation and Reaction during Cyclic Loading in hcp Titanium: *Dongsheng Xu*¹; Hao Wang¹; David Rugg²; Aijun Huang³; Rui Yang⁴; James Williams⁴; ¹Institute of Metal Research, Chinese Academy of Sciences; ²Rolls-Royce PLC; ³Baosteel Group Corporation; ⁴Ohio State University

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling — Ion Beam Irradiation and Advanced Characterization Techniques

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

Program Organizers: Peter Hosemann, University of California Berkeley; Julie Tucker, Knolls Atomic Power Laboratory; James Cole, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Monday PM Room: 33B
February 17, 2014 Location: San Diego Convention Center

Session Chair: James Cole, Idaho National Laboratory

2:00 PM

Behavior of Fe-Cr Alloys under Ion or Neutron Irradiation: *Emmanuelle Marquis*¹; Mukesh Bachhav¹; Reshma Mathew¹; G.Robert Odette²; ¹University of Michigan; ²University of California, Santa Barbara

2:40 PM

Effect of Neutron Irradiation on Select Mn+1AXn Phases: *Darin Tallman*¹; Elizabeth Hoffman²; El'ad Caspi¹; Gordon Kohse³; Robert Sindelar²; Michel Barsoum¹; ¹Drexel University; ²Savannah River National Lab; ³MIT Nuclear Reactor Laboratory

3:00 PM

Ion Irradiation Effects on Nanocluster Precipitation in Steels: *Z. W. Zhang*¹; C. T. Liu²; X-L. Wang²; M. K. Miller³; D. Ma³; J. R. Williams⁴; B. A. Chin⁴; ¹Harbin Engineering University; ²City University of Hong Kong; ³Oak Ridge National Laboratory; ⁴Auburn University

3:20 PM

Influence of Proton Irradiation on the Precipitation Kinetics and Mechanical Properties of an Intermetallic Precipitation Hardened Steel: *Christina Hofer*¹; E. Stergar²; H. Leitner¹; Y. Wang³; P. Hosemann⁴; ¹Montanuniversität Leoben; ²SCKCEN Belgian Nuclear Research Center; ³Los Alamos National Laboratory; ⁴University of California, Berkeley

3:40 PM Break

4:00 PM

Characterization of Radiation Damage Tolerant Cu/Nb Nanocomposites Using Synchrotron Based X-ray Methods and Transmission Electron Microscopy: *Simerjeet Gill*¹; Lynne Ecker¹; Mike Demkowicz²; Amit Misra³; ¹Brookhaven National Laboratory; ²Massachusetts Institute of Technology; ³Los Alamos National Laboratory

4:20 PM

In Situ Measurement of Heavy-ion-irradiation-induced Plastic Flow of Amorphous CuTiAg Micropillars: *Sezer Ozerinc*¹; Robert Averback¹; William King¹; ¹University of Illinois at Urbana-Champaign

4:40 PM

Contribution from Anisotropic Dislocation Loop Distribution to Irradiation Creep of F-M Steel T₉₁: *Cheng Xu*¹; Gary Was¹; ¹University of Michigan

5:00 PM

Relaxation Time of Transient Radiation Induced Defects: *Thomas Schenkel*¹; Steven Lidia¹; Peter Hosemann²; Andrew Minor²; Kin Yu¹; Christoph Weis¹; ¹Lawrence Berkeley National Laboratory; ²University of California

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Dislocations and Plasticity

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Materials Characterization Committee, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Khalid Hattar, Sandia National Laboratories; Marko Knezevic, University of New Hampshire; Irene Beyerlein, Los Alamos National Laboratory

Monday PM
February 17, 2014
Room: 8
Location: San Diego Convention Center

Session Chairs: Tom Bieler, Michigan State; Irene Beyerlein, Los Alamos National Laboratory

2:00 PM Invited

Slip and Slip Traces in BCC Metals: In Situ Laue Diffraction: *Helena Van Swygenhoven*¹; Cecile Marichal¹; Ainara Irastorza-Landa¹; Steven Van Petegem¹; Camelia Borca¹; ¹Paul Scherrer Institut

2:30 PM Invited

Four-dimensional Deformation Studies in the Electron Microscope: Ian Robertson¹; Josh Kacher²; ¹University of Wisconsin-Madison; ²Lawrence Berkeley National Laboratory

3:00 PM Invited

Quantifying the Dislocation Structure Evolution Induced by Neutron Irradiation, Plastic Deformation and Annealing in Zr-2.5Nb by Diffraction Line Profile Analysis: *Levente Balogh*¹; Donald Brown²; Paula Mosbrucker³; Fei Long¹; Mark Daymond¹; ¹Queen's University; ²Los Alamos National Laboratory; ³Kinectrics Inc.

3:30 PM Break

3:50 PM

Defect Analysis Using a Segmented STEM Detector: Theory and Potential Applications: *Matthew Bowers*¹; Michael Mills¹; Marc de Graef¹; ¹The Ohio State University

4:10 PM

Identification of Deformation Mechanisms by Crystal Plasticity Models with Hardening Laws Based on Dislocation Density: *Marko Knezevic*¹; Milan Ardeljan¹; Rodney McCabe²; Irene Beyerlein²; Thomas Nizolek³; Nathan Mara²; Tresa Pollock³; Donald Brown²; Carlos Tome²; ¹University of New Hampshire; ²Los Alamos National Laboratory; ³University of California at Santa Barbara

4:30 PM

Full Field Modeling of TWIP Steels Deformation Behavior Combining Fast Fourier Transforms and a Micromechanical Viscoplastic Texture Model: *Vahid Tari*¹; Anthony Rollett²; Hossein Beladi³; Haitham Kadiri¹; ¹Mississippi State University; ²Carnegie Mellon University; ³Deakin University

4:50 PM

Crystal Plasticity and Grain-orientation-dependent hkl-lattice Strain in Polycrystalline SUS316: *Lili Zheng*¹; Wei Yuan¹; Harsha Badarinarayan¹; ¹Hitachi America Ltd

5:10 PM

Microstructure-informed Modeling of the Deformation Response of Advanced High Strength Steels: Peng Chen¹; *Hassan Ghassemi Armaki*¹; Shrikant Bhat²; Sriram Sadagopan²; Allan Bower¹; Sharvan Kumar¹; ¹Brown University; ²ArcelorMittal

Advanced Composites for Aerospace, Marine, and Land Applications — Characterization of Composite Microstructures and Phases

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

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

Monday PM
February 17, 2014
Room: 6F
Location: San Diego Convention Center

Session Chairs: Tushar Borkar, University of North Texas; Tirumalai Srivatsan, University of Akron

2:00 PM Invited

Three-dimensional Tomographic Characterization of Woven Ceramic Textile Composites under In Situ Loading at Ultrahigh Temperatures: Hrishikesh Bale¹; Siyuan Xin¹; Brian Cox²; David Marshall²; *Robert Ritchie*¹; ¹University of California Berkeley; ²Teledyne Science Center

2:40 PM

Laser Deposited In Situ TiC Reinforced Nickel Matrix Composites: Microstructure and Tribological Properties: *Tushar Borkar*¹; Sundeepp Gopagoni¹; Junyeon Hwang²; Soumya Nag¹; Jamie Tiley³; Rajarshi Banerjee¹; ¹University of North Texas; ²Korea Advance Institute of Science and Technology; ³Airforce Research Laboratory

3:00 PM

Squeeze Infiltration Processing of Micro Silica Reinforced Aluminium-based Metal Matrix Composites: V. Resmi¹; Prince Joseph¹; T. Rajan¹; B. Pai¹; Tirumalai Srivatsan²; *K. Sree Manu*¹; ¹CSIR; ²The University of Akron

3:20 PM

Fabrication and Characterization of a Hybrid Functionally Graded Metal-based Composite Using the Technique of Squeeze Infiltration: *K. Sree Manu*¹; V. Resmi¹; Prince Joseph¹; T. P. Rajan¹; B. Pai¹; Tirumalai Srivatsan²; ¹CSIR; ²The University of Akron

3:40 PM Break

4:00 PM

The Microstructure and Mechanical Properties of Magnetic Shape Memory Alloys NiCo₄₀+xA₁₃₀-x(X=0, 3, 6, 10): *Jia Ju*¹; Feng Xue¹; Jian Zhou¹; Jing Bai¹; Huan Liu¹; ¹Southeast University

4:20 PM

Microstructural Analysis of a Diffusion Bonded Titanium Alloy with Titanium Alloy and Titanium Alloy with Copper: *Chandrappa Kasigavi*¹; ¹Siddaganga Institute Of Technology

4:40 PM Invited

Metal Matrix Composites Directionally Solidified: Alicia Ares¹; *Carlos Schvezov*¹; ¹Materials Institute of Misiones (IMAM)-Faculty of Sciences (FCEQyN-UNaM)



Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion II — Capacitor and Dielectric Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Energy Conversion and Storage Committee, TMS; Magnetic Materials Committee
Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael McHenry, Carnegie Mellon University; Matthew Willard, Case Western Reserve University; Rachael Myers-Ward, NRL; Mike Lanagan, Penn State University; Clive Randall, Penn State University

Monday PM Room: Cardiff
 February 17, 2014 Location: San Diego Marriott Marquis & Marina

Session Chair: Michael Lanagan, Penn State University

2:00 PM Invited

High Temperature Capacitor Films: *Daniel Tan*¹; Yang Cao¹; Xiaomei Fang¹; Patricia Irwin¹; ¹GE

2:30 PM Invited

Barium Oxide Based Glasses for Dielectric Material: *Charles Stutz*¹; Chad Holbrook¹; Shibalik Chakraborty²; Sriram Ravindren²; Punit Boolchand²; Jonathan Goldstein¹; ¹US Air Force; ²University of Cincinnati

3:00 PM

Characterization of Degradation for MLCC under Thermal and Electrical Load Using DLTS Method: *Takafumi Okamoto*¹; Noriyuki Inoue¹; Clive Randall²; ¹Murata Mfg. Co., Ltd.; ²The Pennsylvania State University

3:20 PM

Investigation of Low Oxygen Partial Pressure Processing of Alkali Niobate Perovskite: *Hiroyuki Shimizu*¹; Keisuke Kobayashi²; Yutaka Doshida²; Youichi Mizuno²; Clive A. Randall³; ¹Taiyo Yuden Co., Ltd./PennState; ²Taiyo Yuden Co., Ltd.; ³PennState

3:40 PM Break

4:00 PM Invited

Capacitor Development for Reliable High Temperature Operation in Inverter Applications: Harlan Brown-Shaklee¹; *Geoff Brennecke*¹; Natthaphon Raengthon²; David Cann²; Stan Atcity¹; ¹Sandia National Laboratories; ²Oregon State University

4:30 PM Invited

High-dielectric Constant, High-Temperature Ceramic Capacitors for Power Inverters: *U. (Balu) Balachandran*¹; Manoj Narayanan¹; Zhongqiang Hu¹; Chan Park¹; Tae Lee¹; Stephen Dorris¹; Beihai Ma¹; ¹Argonne National Laboratory

5:00 PM

Strongly Dipolar Polythiourea, Polyurea Dielectrics with High Electrical Breakdown, Low Loss, and High Electrical Energy Density: *Shan Wu*¹; Minren Lin¹; Qiming Zhang¹; ¹The Penn State University

5:20 PM

Self Healing Thin Film Electrodes for Increased Electrical Component Reliability: *Betul Akkopru Akgun*¹; ¹The Pennsylvania State University

Advanced Materials in Dental and Orthopedic Applications — Next Generation Biomaterials for Prosthodontics and Orthopedics

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS; Biomaterials Committee
Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Hanson Fong, University of Washington; Mathew Mathew, Rush University Medical Center; Cortino Sukotjo, University of Illinois at Chicago

Monday PM Room: 32B
 February 17, 2014 Location: San Diego Convention Center

Session Chairs: Terry Lowe, Manhattan Scientifics Inc. Company; Tolou Shokuhfar, Michigan Technological University

2:00 PM Invited

From Nanotechnology To Picotechnology: Revolutionizing Medicine: Thomas Webster¹; ¹Northeastern University

2:30 PM Invited

Endurance of Low-modulus Beta-type Titanium Alloys for Spinal Fixation: *Mitsuo Niinomi*¹; Masaaki Nakai¹; Junko Hieda¹; Ken Cho¹; Kengo Narita¹; ¹Tohoku University

3:00 PM

“Changing Landscape Coatings” for Bone Fixation Implants: Greg Nelson¹; *John Nychka*¹; Andre McDonald¹; ¹University of Alberta

3:20 PM Break

3:40 PM Invited

Multifunctional Nanostructured Orthopedic Implant Surfaces - Characteristics and Fabrication Processes: *Craig Friedrich*¹; ¹Michigan Technological University

4:10 PM

Ti-Nb-based Metastable Materials with Improved Biomechanical Properties: *Mariana Calin*¹; Matthias Bönisch¹; Arne Helth¹; Ksenia Zhuravleva¹; Jose Julio Gutiérrez Moreno²; Christina Lekka²; Annett Gebert¹; Jürgen Eckert¹; ¹IFW Dresden; ²University of Ioannina

4:30 PM

Next Generation Surface Modification of Ni-Ti Alloys for Stent Application after Magnetoelectropolishing: *Puneet Gill*¹; Vishal Musaramthota¹; Norman Munroe¹; Waseem Haider²; Amit Datye³; Rupak Dua¹; Ryszard Rokicki⁴; Anthony McGoron¹; ¹Florida International University; ²University of Texas; ³The University of Tennessee; ⁴Electrobright

4:50 PM

Design Strategy for Biodegradable Mg-based Alloys for Medical Applications: *Yongjun Chen*¹; Zhigang Xu¹; Christopher Smith¹; Jag Sankar¹; ¹Department of Mechanical Engineering, North Carolina Agricultural & Technical State University

5:10 PM

Fabrication of TiO₂ Nanotube Arrays Using 1,2-Propanediol Electrolyte for Application in Biomedical Implants.: *Debmalya Ganguly*¹; Yu Zhao¹; ¹Michigan Technological University

Advances in Surface Engineering: Alloyed and Composite Coatings III — Laser Processing, Thermal Spraying, and Friction Stir Processing of Coatings

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee

Program Organizers: Sandip Harimkar, Oklahoma State University; Jeff De Hosson, Univ of Groningen; Roger Narayan, University of North Carolina and North Carolina State University; Efstathios (Stathis) Meletis, University of Texas at Arlington; Virendra Singh, Schlumberger Rosharon Campus; Srinivasa Bakshi, Indian Institute of Technology-Madras; Mathieu Brochu, McGill University; Arvind Agarwal, Florida International University; Jian Luo, UC San Diego; Nancy Michael, University of Texas at Arlington; Nugehalli Ravindra, New Jersey Institute of Technology; Adele Carrado, IPCMS; Choong-un Kim, University of Texas at Arlington; Amit Pandey, Rolls Royce LG Fuel Cell

Monday PM
February 17, 2014

Room: 1B
Location: San Diego Convention Center

Session Chairs: Srinivasa Bakshi, Indian Institute of Technology-Madras; Mathieu Brochu, McGill University

2:00 PM Invited

Use of Two Photon Polymerization to Create Microscale and Nanoscale Features: *R. Narayan*¹; ¹UNC/NCSSU Joint Department of Biomedical Engineering

2:20 PM Invited

Fiber Laser Cladding of Spherotene Spherical Fused WC/Inconel 625 Metal Matrix Composite (MMC) Coatings: *Jianyin Chen*¹; Lijue Xue¹; ¹National Research Council Canada

2:40 PM

Laser Surface Hardening of Fe-based Bulk Amorphous Alloys: Ashish Singh¹; Farhadul Haque¹; Shravan Katakam²; Narendra Dahotre²; *Sandip Harimkar*¹; ¹Oklahoma State University; ²University of North Texas

2:55 PM

Fabrication of Surface Composite via Additive Friction Stir Technology: Kumar Kandasamy¹; Jacob Calvert¹; Liam Renaghan¹; Kevin Creehan¹; *Jeffrey Schultz*¹; ¹Aeroprobe Corporation

3:10 PM

Prediction of Intermetallics Evolved during Laser Surface Alloying of Molybdenum on Aluminum: Experimental & Theoretical Approach: *Ravi Rajamure*¹; Hitesh Vora¹; Srinivasan Srivilliputhur¹; Narendra Dahotre¹; ¹University of North Texas

3:25 PM

New Developments in High Velocity Air-fuel Spraying: *Andrew Verstak*¹; ¹Kermetico inc.

3:40 PM Break

3:50 PM

Development of Solvothermally Densified Thermal Sprayed Coatings for Waste Incinerator Plants: *Patrick Masset*¹; Sebastian Schuster¹; Thomas Fehr²; ¹Fraunhofer UMSICHT; ²Dept. für Geo- & Umweltwissenschaften

4:05 PM

Improvement of Arbid Type Refractories Using Thermal Plasma Treatments: *Aleksandar Mitrasinovic*¹; Larry Pershin¹; Javad Mostaghimi¹; ¹University of Toronto

4:20 PM

Nanostructured Plasma Sprayed 6061Al-SiC Composite Coatings: *Satish Tailor*¹; V. K. Sharma Sharma¹; R. M. Mohanty²; P. R. Soni¹; ¹Malaviya National Institute of Technology Jaipur; ²Council of Scientific and Industrial Research

4:35 PM

Texturing of Steel Surfaces by Friction Stir Processing: *Dulce Rodrigues*¹; Inês Costa¹; ¹CEMUC-University of Coimbra

4:50 PM

Oxide Based Thermal Sprayed Coatings for Metal Dusting Applications: Patrick Masset¹; *Eva Drechsler*¹; Christoph Weih¹; ¹Fraunhofer UMSICHT

Algorithm Development in Computational Materials Science and Engineering — Algorithms for Lower Length Scale Modeling: Ab Initio, Atomistics and Materials Chemistry: Part II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee

Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas; Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, Army Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology

Monday PM
February 17, 2014

Room: 31B
Location: San Diego Convention Center

Session Chairs: Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, U.S. Army Research Laboratory

2:00 PM Invited

Structure Identification, Quantification and Visualization for Atomistic Simulations: *Alexander Stukowski*¹; ¹Darmstadt University of Technology

2:40 PM

The Elastic-plastic Decomposition of the Atomistic Stress Tensor: *Nikhil Chandra Admal*¹; Ellad Tadmor¹; ¹University of Minnesota

3:00 PM

A Kinetic Monte Carlo Model for Material Aging: Simulations of Second Phase Formation at Au/Bi₂Te₃ Junction in Oxygen Environments: *Xiaowang Zhou*¹; Nancy Yang¹; ¹Sandia National Laboratories

3:20 PM

Green's Function Methods for Monte Carlo Simulations of Materials on Extended Time Scales: *Vasily Bulatov*¹; ¹LLNL

3:40 PM Break

4:00 PM

Implementation and Validation of a Multiphase Multigrain Model of Equiaxed Solidification: *Marcelo Martorano*¹; Juan Arango¹; Franco Ramunno¹; ¹University of São Paulo

4:20 PM

Numerical Simulation of Macroseggregation with Multiphase Model and Non-orthogonal Grids: *Wutao Tu*¹; Wensheng Li²; Houfa Shen¹; Baicheng Liu¹; ¹Tsinghua University; ²Electric Power Research Institute of Guangdong Power Grid Corporation

4:40 PM

Parallel-tempering Implementation of Grand-canonical Monte Carlo Simulation for Solids: *Tongsik Lee*¹; Michael Baskes¹; Christopher Taylor¹; Michael Demkowicz²; ¹Los Alamos National Laboratory; ²Massachusetts Institute of Technology

Alumina and Bauxite — Bayer Process/Quality

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Ian Duncan, Hatch Ltd

Monday PM
February 17, 2014

Room: 15B
Location: San Diego Convention Center

Session Chair: Stephen Lindsay, Alcoa

2:00 PM Introductory Comments

2:05 PM

Evolution of the Technology for the Production of Alumina from Bauxites: Viktor Medvedev¹; Serguey Akhmedov¹; ¹ALCORUS Co Ltd



2:30 PM

Approaches to the Processing of Jamaican Bauxite with High Aluminous Goethite Content: *Desmond Lawson*¹; Ab Rijkeboer²; Horace Lawrence¹; Dejan Dajkovic¹; Marvin Jackson²; ¹est Indies Alumina Co; ²Rinalco B.V

2:55 PM

Improvement of Processing Characteristics of High Carbonate and High Silica Diasporic Bauxite by Enriching Roasting: *Andrey Panov*¹; Alexander Suss¹; Irina Paromova¹; Alexander Fedyayev¹; ¹RUSAL Engineering & Technology Centre

3:20 PM

New High Performance Crystal Growth Modifiers to Improve Alumina Trihydrate Quality and Yield: Ryan Chester¹; John Kildea¹; *Everett Phillips*²; ¹Nalco Australia Pty Ltd; ²Nalco Company

Aluminum Alloys: Development, Characterization and Applications — Development and Application

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Xiyu Wen, University of Kentucky

Monday PM
February 17, 2014

Room: 12
Location: San Diego Convention Center

Session Chair: Zhengdong (Steven) Long, Kaiser Aluminum

2:00 PM Invited

Aluminum Alloys and Manufacturing Processes for Automotive Structural Applications: *Alan Luo*¹; ¹The Ohio State University

2:20 PM

AMAG 6XXX Series Alloys for Chassis Application in the Automotive Industry: *Josef Berneder*¹; Ramona Prillhofer¹; Josef Enser¹; Torsten Grohmann¹; ¹AMAG Rolling

2:40 PM

Unusual Nanostructures in a Rapidly-solidified Aluminum Alloy for Advanced Energy Applications: *Manuel Marya*¹; Indranil Roy¹; ¹Schlumberger Technology Corporation

3:00 PM

Friction Stir Welding of Al-Cu-Li-Mg-Ag (2098), Al-Cu-Li-Mg-Zn (2199) and Al-Mg-Li (1424): A Comparative Study of Resulting Microstructure and Mechanical Property: *Harpreet Sidhar*¹; Rajiv Mishra¹; Anthony Reynolds²; John Baumann³; Juergen Silvanus⁴; ¹University of North Texas; ²University of South Carolina; ³The Boeing Company; ⁴EADS Innovation Works Germany

3:20 PM

Heat Treating of High Pressure Die Castings; Challenges and Possibilities: *Salem Seifeddine*¹; Darya Poletaeva²; Mohammad Ghorbani²; Anders Jarfors²; ¹Swerea SWECAS; ²School of Engineering, Jönköping University

3:40 PM Break

3:55 PM

Influence of the Chemical Composition on the Ductility of an AlSiCuZnFe Recycling Foundry Alloy: *Philip Pucher*¹; Holm Böttcher¹; Helmut Antrekowitsch²; Peter Uggowitzer³; Helmut Kaufmann⁴; ¹AMAG CASTING; ²University of Leoben; ³ETH Zurich; ⁴AMAG AG

4:15 PM

Assessment of Hot Cracking during TIG Welding of B206 Aluminum Alloy: *Francesco D'Elia*¹; Anthony Lombardi¹; Comondore (Ravi) Ravindran¹; Dimitry Sediako²; K. Prasad Rao³; ¹Ryerson University; ²Canadian Neutron Beam Centre - National Research Council of Canada; ³Indian Institute of Technology Madras

4:35 PM

Influence of Microstructure on the Folding Behavior of Crash Relevant Aluminum Extrusion Parts: *Marcel Rosefort*¹; Ruven Baumgart¹; Christiane Matthies¹; Hubert Koch¹; ¹TRIMET Aluminium SE

4:55 PM

Effect of TiC Powder Addition on the Grain Refinement Response of B319 Aluminum Alloy: *Vishank Kumar*¹; Lukas Bichler¹; ¹University of British Columbia, Canada

5:15 PM

Properties of AlZn10Si8Mg Alloys for High Performances Application: *Mario Rosso*¹; ¹POLITECNICO di Torino

Aluminum Processing — Aluminum Processing: Rolling & Twin-Roll Casting

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Kai Karhausen, Hydro Aluminium Rolled Products GmbH

Monday PM
February 17, 2014

Room: 13
Location: San Diego Convention Center

Session Chair: To Be Announced

2:00 PM Introductory Comments

2:05 PM Invited

Towards Real-time Physics-based Simulation of Al Sheet Processing: *Günter Gottstein*¹; Markus Kuehbach¹; Luis Barrales-Mora¹; ¹RWTH Aachen University

2:25 PM

Comparison of Texture Prediction in Cold Rolling of Aluminum with VPSC, CP-FEM and GIA: *Stephan Hojda*¹; Markus Bambach¹; Stephan Heppner¹; ¹Institute of Metal Forming

2:45 PM

Evolution of Microstructure and Texture during Severe Cold Rolling and Annealing of Al-2.5%Mg and Al-2.5%Mg-0.2%Sc Alloys: *Jagga Gatti*¹; Pinaki Bhattacharjee¹; ¹Indian Institute of Technology Hyderabad

3:05 PM

Dynamic Simulation of Internal Logistics in Aluminum Downstream Manufacturing: *Anton Winkelmann*¹; Sverre Brandal²; Stefan Neumann³; Juliens Desjardins⁴; ¹Hydro Aluminium Deutschland GmbH; ²Hydro Aluminium AS; ³Hydro Aluminium Rolled Products; ⁴Idecraft

3:25 PM Break

3:40 PM

Study of Wire Fabrication of Aluminum Treated with Diboride Particles: *Alexandra Padilla*¹; Raul Marrero¹; David Florian¹; Marcelo Suarez¹; ¹University of Puerto Rico, Mayagüez Campus

4:00 PM

Influence of the Twin-roll Casting Parameters on the Microsegregation in Thin Strips of the Aluminium Alloy EN AW-6082: *Olexandr Grydin*¹; Mykhailo Stolbchenko²; Florian Nürnberger¹; Mirko Schaper²; ¹Leibniz Universität Hannover; ²Universität Paderborn

4:20 PM

Determination of Aluminum Rolling Oil and Machinery Oil Residues on Aluminum Sheet and Foil by Using Elemental Analysis and Fourier Transform Infrared Spectroscopy Coupled with Multivariate Calibration: *Özlem Inanç Uçar*¹; *Hatice Mollaoglu Altuner*¹; Mert Günyüz¹; Mustafa Murat Dündar¹; Durmus Özdemir¹; ¹Assan Alüminyum

4:40 PM

Flow Behaviour and Constitutive Modelling of Aluminium Alloy Sheet for Hot Blank-cold Die (HB-CD) Forming: *Fadi Abu-Farha*¹; ¹Clemson University

5:00 PM

Analysis of Interdendritic Strain during Dendritic Solidification in Twin-roll Strip Casting of Aluminum Alloys: *Mostafa ElBealy*¹; ¹Company Chair of JK

Aluminum Reduction Technology — Cell Design and Performance

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Margaret Hyland, University of Auckland

Monday PM
February 17, 2014

Room: 14B
Location: San Diego Convention Center

Session Chair: Pascal Lavoie, Light Metals Research Centre

2:00 PM Introductory Comments

2:05 PM

Preparation and Start-Up of Arvida Smelter, AP60 Technological Center: *René Gariépy*¹; *André Couturier*¹; *Olivier Martin*¹; *Bertrand Allano*¹; *André Machado*¹; *François Charmier*¹; ¹Rio Tinto Alcan

2:30 PM

Industrial Running of the 530kA Potline in North-western China: *Xiping Chen*¹; *Xuemin Liang*²; ¹Zhengzhou Research Institute of Chalco; ²Central South University Institute Co. Ltd

2:55 PM

The End of an Era for Söderberg Technology in North and South America: *Michael Barber*¹; *Alton Tabereaux*¹; ¹Consultant

3:20 PM

Successful Startup of World Largest Greenfield Smelter: *Raja Javed Akhtar*¹; *Salman Abdulla*¹; *Mohammed Al Qassemi*¹; ¹Emirates Aluminium Company (Emal)

Aluminum Reduction Technology — Potline Operations - Cell Operations

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Margaret Hyland, University of Auckland

Monday PM
February 17, 2014

Room: 14A
Location: San Diego Convention Center

Session Chair: Olivier Martin, Rio Tinto Alcan

2:00 PM Introductory Comments

2:05 PM

Cell Electrical Preheating Practices at DUBAL: *Michel Reverdy*¹; *Abdulla Zarouni*¹; *Rawa Ba Raheem*¹; *Ali Al Zarouni*¹; *Nadia Ahli*¹; *Mahasal Khan*¹; *Mohamed Tawfik*¹; *Maryam Al Jallaf*¹; *Ibrahim Baggash*¹; *Kamel Alaswad*¹; *Sergey Akhmetov*¹; *Abdulla Al Jaziri*¹; *Vinko Potocnik*²; *Alexander Arkhipov*¹; ¹DUBAL; ²Vinko Potocnik Consultant Inc.

2:30 PM

DUBAL Cell Voltage Drop Initiatives Towards Low Energy High Amperage Cells: *Michel Reverdy*¹; *Abdulla Zarouni*¹; *Bernard Jonqua*¹; *Nadia Ahli*¹; *Ali Al Zarouni*¹; *Lalit Mishra*¹; *Marwan Bastaki*¹; *Amal Al Jasmi*¹; *Vinko Potocnik*¹; ¹DUBAL

2:55 PM

Start up of the Shut Down Pots - Problems and Solutions to Improve the Results: *Diego Marinho*¹; ¹Votorantim Metais CBA

3:20 PM

Thermal Events of the Early Life of an Aluminium Electrolysis Cell: *Adam Ugron*¹; *Laszlo Kiss*¹; *Sebastien Guerard*²; *Jean-Francois Bilodeau*²; ¹UQAC/GRIPS; ²RTA/CRDA

3:45 PM Break

4:00 PM

Regulation System to Improve Quality of the Metal Sucked during Tapping Operation: *Anne-Gaëlle Hequet*¹; ¹ECL

4:25 PM

Key Success Factors Deploying a Manufacturing Excellence Solution(MESAL™) in Rio Tinto Alcan: *Manuel Chareyre*¹; *Steve Boivin*²; ¹Rio Tinto Alcan – Smelter Technology (AP); ²Rio Tinto Alcan - IS&T

Biological Materials Science Symposium — Mechanical Behavior of Biological Materials II: Natural Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Po-Yu Chen, National Tsing Hua University; Rajendra Kasinath, Johnson and Johnson Company; Dwayne Arola, University of Washington; Kalpana Katti, North Dakota State University

Monday PM

February 17, 2014

Room: 33A

Location: San Diego Convention Center

Session Chairs: Francois Barthelat, McGill University; Dwayne Arola, University of Maryland Baltimore County

2:00 PM Invited

Flexible Dermal Armor: Perspectives for Bioinspired Designs: *Marc Meyers*¹; *Robert Ritchie*²; *Wen Yang*¹; *Bernd Gludovatz*³; *Elizabeth Zimmermann*³; *Irene Chen*¹; ¹UCSD; ²LBL/UCBerkeley; ³Lawrence Berkeley Lab.

2:30 PM

Flexible Dermal Armor: Biodesigns Learned from Nature: *Irene Chen*¹; *Wen Yang*¹; *Marc Meyers*¹; ¹UC San Diego

2:50 PM

An Alternate Approach for Characterizing the Fracture Resistance of Cycloid Fish Scales: *Sandra Murcia*¹; *Edgar Ossa*²; *Dwayne Arola*¹; ¹UMBC; ²Universidad Eafit

3:10 PM

Protective Role of Arapaima Scales: Structure and Mechanical Behavior: *Vincent Sherman*¹; *Wen Yang*¹; *Bernd Gludovatz*²; *Elizabeth A. Zimmermann*³; *Eric Schaible*⁴; *Zhao Qin*⁵; *M. J. Buehler*⁵; *Robert O. Ritchie*⁶; *Marc A. Meyers*¹; ¹Materials Science and Engineering Program, University of California, San Diego; ²Materials Sciences Division, Lawrence Berkeley National Laboratory; ³Department of Osteology and Biomechanics (IOBM), University Medical Center Hamburg-Eppendorf; ⁴Experimental Systems Group, Advanced Light Source, Lawrence Berkeley National Laboratory; ⁵Department of Civil and Environmental Engineering, Massachusetts Institute of Technology; ⁶Department of Materials Science and Engineering, University of California, Berkeley

3:30 PM Break

3:40 PM Invited

Overcoming the Brittleness of Glass through Bio-inspiration and Microarchitecture: *Mohammad Seyed Mirkhalaf*¹; *Ahmad Khayer Dastjerdi*¹; *Francois Barthelat*¹; ¹McGill University

4:10 PM

Multiscale Structural and Mechanics Study of the Red-bellied Woodpecker Beak: *Nayeon Lee*¹; *M Horstemeyer*¹; *Hongjoo Rhee*¹; *Jun Liao*¹; *Lakiesha Williams*¹; ¹Mississippi State University

4:30 PM

Bioinspired Grippers Based on the Seahorse Tail: *Michael Porter*¹; *Tomas Praet*²; *Anabela Maia*²; *Shengqiang Cai*¹; *Benedict Verheghe*²; *Dominique Adriaens*²; *Marc Meyers*¹; *Joanna McKittrick*¹; ¹University of California, San Diego; ²Ghent University



4:50 PM

Roles of Collagen Fibrils on the Mechanical Properties of Skin: Wen Yang¹; Vincent Sherman¹; Bernd Gludovatz²; Elizabeth Zimmermann³; Eric Schaible²; Polite Stewart²; Robert Ritchie⁴; *Marc Meyers*¹; ¹University of California, San Diego; ²Lawrence Berkeley National Laboratory; ³University Medical Center Hamburg-Eppendorf; ⁴University of California, Berkeley

5:10 PM

A Physics-based Model for Mechanical Deformation in Nacre: Sina Askarinejad¹; *Nima Rahbar*¹; ¹Worcester Polytechnic Institute

Bulk Metallic Glasses XI — Structures and Mechanical Properties I

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

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Monday PM

Room: 2

February 17, 2014

Location: San Diego Convention Center

Session Chairs: John Lewandowski, Case Western Reserve University; Ken Kelton, Washington University

2:00 PM Invited

Ductilization of Metallic Glasses by Mechanical Treatment: *Jurgen Eckert*¹; Sergio Scudino¹; Denise Beitelschmidt¹; Hamed Shakur Shahabi¹; Uta Kuehn¹; Mihai Stoica¹; ¹IFW Dresden

2:20 PM

Changes in Microstructure of Zr-Based Bulk Metallic Glass Composites as a Function of Deformation Temperature: *Jessica Booth*¹; John Lewandowski¹; Jennifer Carter¹; ¹Case Western Reserve University

2:30 PM Invited

Fracture Toughness, Flaw Sensitivity, and Engineering Applicability of Ferrous-metal Glasses: *Marios Demetriou*¹; Bernd Gludovatz²; Jong-Hyun Na³; Glenn Garrett³; Robert Ritchie²; William Johnson¹; ¹California Institute of Technology; ²Lawrence Berkeley National Laboratory; ³Glassmetal Technology

2:50 PM

Characterizing Spatial Variations in the Mechanical Properties of Metallic Glass Matrix Composites Using Nanoindentation: *Kelly Kranjc*¹; Douglas Hofmann²; Allen Hunter³; Emmanuelle Marquis³; Wolfgang Windl⁴; Katharine Flores¹; ¹Washington University; ²NASA Jet Propulsion Laboratory; ³University of Michigan; ⁴Ohio State University

3:00 PM Invited

Flow, Fracture, and Fatigue Studies on Bulk Metallic Glasses: *John Lewandowski*¹; ¹Case Western Reserve University

3:20 PM

Controlled Crystallization Behaviour of Metallic Glass Forming Alloys Measured by Electrostatic Levitation: *Chae Woo Ryu*¹; Eun Soo Park¹; Dong Hee Kang²; Geun Woo Lee²; ¹Seoul National University; ²Korea Research Institute of Standards and Science

3:30 PM Break

3:50 PM Invited

Nano-sized Metallic Glasses: A Suite of Unique Properties: *Julia Greer*¹; Jan Rys¹; Dongchan Jang¹; David Chen¹; ¹California Institute of Technology

4:10 PM

Micromechanical Behaviors of Fe Based Bulk Metallic Glass: *Thien Phan*¹; Andrea Hodge¹; Michael Kassner¹; Olivia Graeve²; James Kelly²; ¹University of Southern California; ²University of California, San Diego

4:20 PM Invited

A Bulk Metallic Glass with Record-breaking Damage Tolerance: *Evan Ma*¹; ¹Johns Hopkins University

4:40 PM

Catalytic Behavior of PdSiCu Metallic Glass in Bulk and Thin Film Forms: *Yiyi Yang*¹; Sharvan Kumar¹; ¹Brown University

4:50 PM Invited

Relation between Fragility and the Rate of Structural Ordering in Supercooled Liquids: *Ken Kelton*¹; Nicholas Mauro¹; Matthew Blodgett¹; Mark Johnson¹; Adam Vogt¹; ¹Washington University

5:10 PM

Effect of Severe Plastic Deformation on Mechanical Property and Relaxation Behavior of Zr₅₀Cu₄₀Al₁₀ Bulk Metallic Glass: *Nozomu Adachi*¹; Yoshikazu Todaka¹; Kazuya Shintani¹; Minoru Umemoto¹; Yoshihiko Yokoyama²; ¹Toyohashi University of Technology; ²Institute for Materials Research, Tohoku University

5:20 PM Invited

Mechanical Properties of a Shear-band in a Metallic Glass: *Robert Maass*¹; Matthias Buechschuetz-Goebler¹; Hai-Bin Yu¹; Walter Arnold²; Konrad Samwer¹; Cynthia Volkert¹; ¹Georg-August Universität Göttingen; ²Saarland University

Cast Shop for Aluminum Production — Macrosegregation and DC Casting

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Edward Williams, Alcoa

Monday PM

Room: 15A

February 17, 2014

Location: San Diego Convention Center

Session Chair: J. Lee Davis

2:00 PM Introductory Comments

2:05 PM

Mechanisms and Control of Macrosegregation in DC Casting: *Dmitry Eskin*¹; ¹Brunel University

2:35 PM

Modelling of Micro- and Macrosegregation in Multicomponent Aluminium Alloys Accounting for Secondary Phase Formation: *Kjerstin Ellingsen*¹; ¹SINTEF

3:00 PM

Macrosegregation Modelling of DC-casting Including Grain Motion and Surface Exudation: *Dag Mortensen*¹; Mohammed M'Hamdi²; Kjerstin Ellingsen²; Knut Tveito³; Liss Pedersen⁴; Geir Grasmø⁴; ¹Institute for Energy Technology; ²SINTEF Materials and Chemistry; ³Norwegian University of Science and Technology; ⁴Alcoa Norway

3:25 PM

A New DC Casting Technology for Extrusion Billets with Improved Surface Quality: *Arild Hakonsen*¹; John Hafsås Hafsås²; Rune Ledal¹; ¹Hycast AS; ²Hydro Aluminium

3:50 PM Break

4:05 PM

An Innovative Automated Surface Inspection of DC Cast Billets: *Philippe Martin*¹; Roch Larouche²; Jean-Alain Laurin¹; ¹Rio Tinto Alcan; ²NYX Dimensions Inc.

4:30 PM

Impact of Cooling Water Composition on Heat Transfer in Ingot Casting: *David Gildemeister*¹; ¹Alcoa Technical Center

4:55 PM

Neutron Diffraction Measurements of As-cast Residual Stresses in AA7050 Rolling Plate Ingots: Influence of a Wiper: *Jean-Marie Drezet*¹; Pierre Celle²; Olivier Ribaud³; Thilo Pirling⁴; ¹Ecole Polytechnique Federale Lausanne; ²Constellium, Centre de Recherches de Voreppe (CRV); ³Constellium, Centre de Recherches de Voreppe (CRV); ⁴Institut Laue Langevin

Celebrating the Megascale: An EPD Symposium in Honor of David G.C. Robertson — Ferro-Alloys

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, W A School of Mines; Geoffrey Brooks, Swinburne University of Technology

Monday PM
February 17, 2014

Room: 16A
Location: San Diego Convention Center

Session Chairs: Rodney Jones, Mintek; Lloyd Nelson, Anglo American Platinum Limited

2:00 PM Introductory Comments

2:05 PM Invited

Developments in Manganese Ferroalloy Research and Production in the Last 25 Years: *Merete Tangstad*¹; Ragnar Tronstad²; ¹NTNU; ²Elkem Solar

2:25 PM Invited

DC Arc Furnaces - Past, Present, and Future: *Rodney Jones*¹; ¹Mintek

2:45 PM

Recent Developments in FactSage Thermochemical Software and Databases: *Christopher Bale*¹; ¹CRCT - Center for Research in Computational Thermochemistry

3:05 PM Invited

Reduction of Agglomerated Manganese Ores in a 150kW Pilot Scale Furnace: *Thomas Brynjulfssen*¹; Merete Tangstad¹; ¹Norwegian University of Science and Technology

3:25 PM Break

3:45 PM

Arc Detection in DC Arc Furnaces: *Quinn Reynolds*¹; ¹Mintek

4:05 PM

An Electromagnetically Stirred Slurry Model for the Smelting Zone of a Ferroalloy Furnace: *Ben Bowman*¹; ¹Consultant

4:25 PM

Technical Aspects of Large-scale Ferro-alloy Electric Furnace Smelting: *Lloyd Nelson*¹; ¹Anglo American Platinum Ltd

4:45 PM

Role of Mn Carbides in Carbothermic Processes of Mn Alloys: Byeong Lee¹; H.K. Shin¹; *Young Lee*¹; ¹Dongbu Metal Company

Characterization of Minerals, Metals and Materials 2014 — Characterization of Composites

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

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Monday PM
February 17, 2014

Room: 7A
Location: San Diego Convention Center

Session Chairs: Florence Vivier, ITT; Priscila Alves Martins, LAREX-POLI-USP

2:00 PM

Microstructural Characterization of Eroded M26 HET Thruster Wall: *Thomas Burton*¹; Gregory Thompson¹; Aaron Schinder²; German Capuano²; Julian Rimoli²; Mitchell Walker²; ¹University of Alabama; ²Georgia Institute of Technology

2:20 PM

A Kinetic Analysis of a Thermal Curing Reaction of a Silicon Resin in Solid State: *Florence Vivier*¹; Diego Santamaria²; Diego Pellerej²; Pietro

Buonfio²; Marco Sangermano³; ¹ITT ; ²ITT; ³Politecnico di Torino

2:40 PM

Biodegradable Flexible Films Based on Copolyester Reinforced with Organophilic Clay: *Edinaldo Severino*¹; Vijaya Rangari²; Valquiria Silva¹; Michelle Gomes¹; Esperidiana Moura¹; Francisco Valenzuela Díaz³; ¹Instituto de Pesquisas Energéticas e Nucleares – IPEN-CNEN/SP; ²Tuskegee University; ³Universidade de São Paulo, Escola Politécnica

3:00 PM

Effects of Green Calcium Carbonate Addition on Mechanical and Morphological Properties of Flexible Films Based on Biodegradable Polymer: Alexandra Silva¹; Valquiria Silva¹; Vijaya Rangari²; Shaik Jeelani³; Rene Oliveira¹; Francisco Valenzuela-Díaz⁴; *Esperidiana Moura*¹; ¹Instituto de Pesquisas Energéticas e Nucleares-IPEN-CNEN/SP; ²Department of Materials Science and Engineering, Tuskegee University; ³Department of Materials Science and Engineering, Tuskegee University; ⁴Metallurgical and Materials Engineering Department, Polytechnic School, University of São Paulo

3:20 PM

Halogen Free Flame Retardant for ABS Composite with Oxide Nanoparticles: *Priscila Martins*¹; Ticiane Valera¹; Julio Bartoli²; Jorge Tenório¹; ¹LAREX- POLI - USP; ²Unicamp

3:40 PM Break

3:50 PM

Investigation on the Thermal Conductivity of Resin Composite Materials: *Kenji Monden*¹; ¹Denki Kagaku Kogyo K.K.

4:10 PM

Obtention and Characterization of Nanocomposites Based on Copolyester Starch Biodegradable Blend and Brazilian Organophilic Clay: *Rosângela Accioli*¹; Vijaya Rangari²; Esperidiana Moura¹; Francisco Valenzuela Díaz³; ¹Instituto de Pesquisas Energéticas e Nucleares; ²Tuskegee University; ³Universidade de São Paulo, Escola Politécnica

4:30 PM

Polypropylene Nanocomposites Reinforced with Organophilic Clay and Brazilian Nut Fibers: Francisco Valenzuela-Díaz¹; *Leila Gomes*¹; Danilo Fermino¹; Maria das Gracas Valenzuela¹; Esperidiana Moura²; ¹Universidade de Sao Paulo; ²Nuclear and Energy Research Institute, IPEN-CNEN/SP

4:50 PM

Interfacial Evolution of Al/Cu Laminated Composite Produced by Asymmetrical Roll Bonding and Annealing: *Xiaobing Li*¹; Guoyin Zu¹; Ping Wang¹; ¹School of Materials and Metallurgy, Northeastern University

5:10 PM

Forging Hot and Cold: Development Through the Ages: *Hugh McQueen*¹; Enrico Evangelista²; ¹Concordia University; ²University of Ancona

Computational Modeling and Simulation of Advanced Materials for Energy Applications — Quantum to Atomistic Simulations

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee

Program Organizers: Lan Li, Boise State University; Laura Bartolo, Kent State University; Cong Wang, Northwestern University; Chandler Becker, NIST

Monday PM
February 17, 2014

Room: Mission Hills
Location: San Diego Marriott Marquis & Marina

Session Chair: Chandler Becker, National Institute of Standards and Technology

2:00 PM Invited

Computational Design of Complex Semiconductor Materials for Energy Application: *Stephan Lany*¹; ¹NREL

2:30 PM

Electrical Properties of Point Defects in CdS and ZnS Thin-film PV Buffer Layers: *Vincenzo Lordi*¹; Joel Varley¹; ¹Lawrence Livermore National Lab



2:50 PM

A Molecular Dynamics Simulation Study of Alkylimidazolium Tetrafluoroborate Confined between the Graphene Electrode: *YounJoon Jung*¹; Sungsik Ju¹; Youngseon Shim¹; ¹Seoul National University

3:10 PM Invited

The Kinetics of Ordering Phase Transformations in Ni-Cr Alloys: *Julie Tucker*¹; Leland Barnard²; Dane Morgan²; George Young¹; ¹Knolls Atomic Power Laboratory; ²University of Wisconsin - Madison

3:40 PM Break

3:55 PM Invited

Nanoscale Metallic Foams, a New Class of Materials for Extreme Environments: *Alfredo Caro*¹; ¹LANL

4:25 PM

Effect of the 3D Porous Structure on the Sintering of Ni Nanoparticles in the Ni/YSZ Anode: A Molecular Dynamics Simulation Study: *Jingxiang Xu*¹; Yuji Higuchi¹; Nobuki Ozawa¹; Momoji Kubo¹; ¹Fracture and Reliability Research Institute (FRRI), Graduate School of Engineering, Tohoku University, Japan

4:45 PM

A GPU-based Kinetic Monte Carlo Approach for the Evolution of Defects in Irradiated Materials: *Fernando Jiménez*¹; Christophe Ortiz¹; ¹CIEMAT

5:05 PM Invited

Atomistic Methods for the Investigation of Radiation Effects: *Roger Stoller*¹; Haixuan Xu¹; Yuri Osetskii¹; ¹Oak Ridge National Laboratory

Computational Thermodynamics and Kinetics — In Honor of Dr. Mark Asta, EMPMD Outstanding Scientist: Session II

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

Monday PM

Room: 30D

February 17, 2014

Location: San Diego Convention Center

Session Chairs: Chris Wolverton, Northwestern University; Timofey Frolov, University of California, Berkeley

2:00 PM Invited

Prefreezing and Premelting at Solid-liquid Interfaces: *Brian Laird*¹; Mark Asta²; Pablo Palafox-Hernandez³; Yang Yang¹; ¹University of Kansas; ²University of California, Berkeley; ³Deakin University

2:30 PM Invited

Shear-coupled Grain-boundary Motion: Insights from Fluctuation Analysis and Atomistic-Scale Simulations: *Alain Karma*¹; Ari Adland¹; Yuri Mishin²; Zachary Trautt³; ¹Northeastern University; ²George Mason University; ³NIST

3:00 PM Invited

Temporal Evolution of the Gamma(fcc)/Gamma-prime(L12) Interfacial Widths in Binary Ni-Al Alloys: *David Seidman*¹; Elizaveta Plotnikov¹; Zugang Mao¹; Ronald Noebe²; ¹Northwestern University; ²NASA Glenn Research Center

3:30 PM Break

4:00 PM Invited

Role of the Solid-liquid Interface in the Brownian Motion of Pb Inclusions in Al: *Ulrich Dahmen*¹; Tamara Radetic²; Erik Johnson³; David Olmsted⁴; Mark Asta⁴; ¹LBNL; ²University of Belgrade; ³University of Copenhagen; ⁴UC Berkeley

4:30 PM Invited

Watching the Evolution of Highly Anisotropic Microstructures: *Ashwin Shahani*¹; John Gibbs¹; Begum Gulsoy¹; Julie Fife²; *Peter Voorhees*¹; ¹Northwestern University; ²Paul Scherrer Institut

Deformation, Damage, and Fracture of Light Metals and Alloys III — Al Alloys

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

Program Organizers: Ke An, Oak Ridge National Laboratory; Qizhen Li, University of Nevada, Reno

Monday PM

Room: 19

February 17, 2014

Location: San Diego Convention Center

Session Chair: Ke An, Oak Ridge National Laboratory

2:00 PM

Characteristics of High Strain Rate Behavior in AA 2219-T87 and AA 2195-T87: *Taylor Murphy*¹; J.A. Schneider¹; H. Hamann²; P. Loewe²; P. Portella²; ¹Mississippi State University; ²BAM

2:30 PM

Characterizing the Hemming Performance of Automotive Aluminum Alloys With High-resolution Topographic Imaging: *Mark Stoudt*¹; Joseph Hubbard¹; John Carsley²; Susan Hartfield-Wünsch³; ¹National Institute of Standards and Technology; ²General Motors Research & Development; ³General Motors Technical Center

2:50 PM

Multi-scale Full-field Optical Measurement of Crack Growth and Deformations in Fatigue of a Welded Aluminum Structure: *Olli Puustinen*¹; Sven Bossuyt¹; ¹Aalto University

3:10 PM

Analysis of the Microstructure and Properties of Friction Stir Weld Zones in the Al 2139-T8 Alloy: *Tomoko Sano*¹; Uchechi Okeke²; Jian Yu¹; Carl Boehlert²; Chian-Fong Yen¹; ¹US Army Research Laboratory; ²Michigan State University

3:30 PM Break

3:45 PM

Intra-granular Failure Mechanisms during Semi-solid Deformation of Al-Cu Microstructures Using 4D In Situ Synchrotron-based X-ray Tomographic Microscopy: *Shyamprasad Karagadde*¹; Biao Cai¹; Julie Fife²; Kristina Kareh³; Peter Lee¹; ¹University of Manchester; ²Paul Scherrer Institut; ³Imperial College London

4:15 PM

Creep-fatigue Behavior of A356 Cast Aluminum Alloy: *Phalgun Nelaturu*¹; Rajiv Mishra¹; Glenn Grant²; Saumyadeep Jana²; Blair Carlson³; ¹University of North Texas; ²Pacific Northwest National Laboratory; ³General Motors R&D Center

4:35 PM

The Effect of Setting Velocity on the Static and Fatigue Strengths of Self-piercing Riveted Joints for Automotive Applications: *Dezhi Li*¹; Li Han²; Andreas Chrysanthou³; Mike Shergold²; Geraint Williams¹; ¹University of Warwick; ²Jaguar Land Rover; ³University of Hertfordshire

Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — High-Strain-Rate Effects in Heterogeneous Materials

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

Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Monday PM
February 17, 2014

Room: 3
Location: San Diego Convention Center

Session Chairs: Larry Murr, University of Texas at El Paso; Lothar Meyer, Nordmetall GmbH

2:00 PM Keynote

The Magic of Deciphering High Strain-rate and High-pressure Properties of Elastomeric Composites, Using Low Frequency Measurements: *Sia Nemat-Nasser*¹; ¹UC San Diego

2:30 PM Invited

The High-strain Rate Loading of Structural Biological Materials: *William Proud*¹; Spyros Masouros¹; Katherine Brown²; ¹Imperial College London; ²University of Cambridge

2:50 PM Invited

On the Modeling of the Dynamic Behavior of Polymers and Polymer Composites: *Said Ahzi*¹; ¹University of Strasbourg

3:10 PM

Insights Into the Effects of Tensile and Compressive Loadings on Microstructure Dependent Fracture of Trabecular Bone: *Vikas Tomar*¹; ¹Purdue University

3:30 PM Break

3:50 PM Invited

Dynamic Tensile Extrusion of High-density Polyethylene: *Eric Brown*¹; George Gray¹; Kyle Ramos¹; Dana Dattelbaum¹; Brian Jensen¹; Adam Iverson²; Carl Carlson²; Kamel Fezza³; ¹Los Alamos National Laboratory; ²National Security Technologies, LLC; ³The Advanced Photon Source

4:10 PM Invited

Accelerated Densification via Localized Contact Heating: Spark-plasma Sintering vs. High Voltage Electric Discharge Consolidation: *Eugene Olevsky*¹; Evgeny Grigoryev²; ¹San Diego State University; ²Moscow Engineering Physics University

4:30 PM Invited

Synthesis of Bulk Nanostructured Materials in Ti-Al-Ni System By Mechanical Alloying and Explosive Consolidation: *Nikoloz Chikhradze; Fernand Marquis*¹; G. Abashidze; Mikheil Chikhradze; ¹Naval Postgraduate School

4:50 PM Invited

Hot Explosive Consolidation Novel Nanostructured W-Ag Composites: *Akaki Peikrishvili*¹; Bagrat Godibadze¹; Elguja Chagelishvili¹; Grigor Mamniashvili¹; Merab Tsiklauri¹; ¹Tsulukidze Mining Institute

5:10 PM

Characterization of the Dynamic Behavior of Recycled Polypropylene-based Composites: *Nadia Bahlouli*¹; ¹University of Strasbourg

Electrode Technology for Aluminium Production — Anode Raw Materials

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Andre Proulx, Rio Tinto Alcan

Monday PM
February 17, 2014

Room: 14B
Location: San Diego Convention Center

Session Chair: Frank Cannova, BP

4:00 PM Introductory Comments

4:05 PM

Impurity Level Distribution in GPC and CPC and Impact on Anode Properties: *Les Edwards*¹; ¹Rain CII Carbon

4:30 PM

Determination of Contact Angle from Raw Material Properties Using Linear Multivariable Analysis: *Arunima Sarkar*¹; Duygu Kocafe¹; Yasar Kocafe¹; Dipankar Bhattacharyay¹; Brigitte Morais²; Charles-Luc Lagacé²; ¹University of Quebec of Chicoutimi; ²Aluminerie Alouette Inc

4:55 PM

Use of Coal Tar Pitch Coke for Producing Prebaked Electrodes: Shoulei Gao¹; Chongai Bao¹; *Euel Cutshall*¹; Baiyuan Xia¹; Rifu Lin¹; Guanghui Lang¹; Joe Woo¹; ¹Sunstone Development Co., Ltd

5:20 PM

Characterization of Dry Aggregates in Carbon Anodes by Image Analysis: *Dipankar Bhattacharyay*¹; Duygu Kocafe¹; Yasar Kocafe¹; Arunima Sarkar¹; Brigitte Morais²; Jerome Chabot²; ¹University of Quebec at Chicoutimi; ²Aluminerie Alouette Inc.

Energy Technologies and Carbon Dioxide Management — Energy in Iron and Steel

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Education Committee, TMS: Energy Committee

Program Organizers: Cong Wang, Northwestern University; Jan de Bakker, BBA, Inc; Cynthia Belt, Consultant; Animesh Jha, University of Leeds; Neale Neelameggham, Ind LLC; Soobhankar Pati, MOxST Inc.; Leon Prentice, CSIRO

Monday PM
February 17, 2014

Room: Balboa
Location: San Diego Marriott Marquis & Marina

Session Chairs: Wanlin Wang, Central South University; Il Sohn, Yonsei University

2:00 PM Keynote

Determination of Energy Requirements for Ironmaking Processes: It's Not that Straightforward: *Hong Yong Sohn*¹; *Miguel Olivas-Martinez*²; ¹University of Utah

2:30 PM Invited

Blast Furnace Ironmaking: Process Alternatives and Carbon Intensity: *P. Chris Pistorius*¹; Jorge Gibson¹; Megha Jampani¹; ¹Carnegie Mellon University

3:00 PM Invited

From Carbon towards Hydrogen in the Steel Industry : Fundamental Aspects and Concerns: *Il Sohn*¹; ¹Yonsei University

3:25 PM Break

3:45 PM Keynote

Flexibility-The Key to Sustainability in Steel Manufacturing: *Sridhar Seetharaman*¹; ¹University of Warwick

4:15 PM Invited

Green Slag System Design during Continuous Casting: *Wanlin Wang*¹; Juan Wei¹; Boxun Lu¹; Lejun Zhou¹; ¹Central South University

4:40 PM Invited

Innovative Hydrogen Production Process Utilizing Thermal and Chemical Energies of Steelmaking Slag: *Hiroyuki Matsuura*¹; Fumitaka Tsukihashi¹; ¹The University of Tokyo



5:05 PM

A Laboratory Experiment Study on Iron Phase Formation during Hydrogen Reduction of Iron Oxides in the Molten Slag: *ChuanJie Cai*¹; ShaoBo Zheng¹; XueBin Hao¹; HuiGai Li¹; ¹ShangHai University

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Microstructure-sensitive and Multiscale Modeling of Fatigue

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

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

Monday PM Room: 7B
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Michael Sangid, Purdue University; Antonios Kotsos, Drexel University

2:00 PM Introductory Comments

2:05 PM Keynote

Microstructure Sensitivity and Uncertainty in Modeling Fatigue Crack Formation and Early Growth in Advanced Alloys: *David McDowell*¹; ¹Georgia Institute of Technology

2:45 PM Invited

A Multi-stage Approach for Microstructure-sensitive Modeling of Fatigue Damage in Metals: *J Jordan*¹; ¹The University of Alabama

3:05 PM Invited

Assessment of Models for Prediction of Small Crack Growth Behavior in Nickel and Titanium Alloys: *Christopher Szczepanski*¹; R. John¹; K. Jha²; P. J. Golden¹; ¹US Air Force Research Laboratory; ²Universal Technology Corporation

3:25 PM Invited

Statistical Modeling for Low Cycle Fatigue: *D Gary Harlow*¹; ¹Lehigh University

3:45 PM Break

4:05 PM

Cyclic Plastic Slip Activity and Early Stages of Fatigue Damage in FCC Polycrystals: Experiments and Simulations with Application to 316L Stainless Steels: Patrick Villechaise¹; *Loïc Signor*¹; Van Truong Dang¹; Emmanuel Lacoste¹; Thomas Ghidossi¹; Stephan Courtin²; ¹ENSMA/Institut Pprime-UPR CNRS3346; ²AREVA-NP

4:25 PM

Influence of Microstructure Variability on Short Crack Growth Behavior: *Andrea Rovinelli*¹; Michael Sangid¹; Ricardo Lebensohn²; ¹Purdue University; ²Los Alamos National Laboratory

4:45 PM

Micro-mechanics Modeling of Surface Roughness Evolution under Thermo-mechanical Fatigue: *Ahmed Hussein*¹; Jaafar El-Awady¹; ¹Johns Hopkins University

5:05 PM

Quantification of Fatigue Weaklinks: *Lin Yang*¹; Tongguang Zhai¹; ¹University of Kentucky

5:25 PM Concluding Comments

Gamma TiAl Alloys 2014 — Session II

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Titanium Committee

Program Organizers: Young-Won Kim, Gamteck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimiduk, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

Monday PM Room: 6B
February 17, 2014 Location: San Diego Convention Center

Session Chairs: David Hu, University of Birmingham; Celine Marcillaud, SNECMA

2:00 PM Invited

Alloy Design Concepts for Wrought High Temperature TiAl Alloys: *Junpin Lin*¹; Xiangjun Xu²; Laiqi Zhang¹; Yongfeng Liang¹; Yong Xu³; Guojian Hao¹; ¹University of Science and Technology Beijing; ²Materials and Chemistry School, Zhongyuan University of Technology; ³School of Materials Science and Engineering, Shandong Jianzhu University

2:25 PM

Microstructure and Properties of a Cast Ti-46Al-8Ta Alloy: *Juraj Lapin*¹; Zuzana Gabalcova¹; Oto Bajana¹; Tatiana Pelachova¹; Hana Stanekova¹; ¹Institute of Materials and Machine Mechanics, Slovak Academy of Sciences

2:45 PM

High Nb Content TiAl Alloys Specified to Cast Process: *Ji Zhang*¹; ¹China Iron and Steel Research Institute Group

3:05 PM Invited

The Use of In Situ Characterization Techniques for the Development of Intermetallic Titanium Aluminides: *Svea Mayer*¹; Helmut Clemens¹; Wilfried Smarsly²; ¹Montanuniversitaet Leoben; ²MTU Aero Engines AG

3:30 PM Break

3:50 PM

Phase Composition and Microstructural Analysis of Titanium Aluminides by In Situ, Real-time Neutron and Synchrotron X-ray Techniques: *Klaus-Dieter Liss*¹; ¹Japan Atomic Energy Agency; Australian Nuclear Science and Technology Organisation

4:10 PM Invited

Fabrication of TiAl Alloys by Powder Metallurgical Methods at Tecnalía: *Miguel Lagos*¹; Iñigo Agote¹; ¹Tecnalía

4:35 PM

Effect of Powder Pre-treatment on the Mechanical Properties of Powder Metallurgy Ti-47Al-2Cr-2Nb-0.15B: *Xu Lei*¹; Wu Jie¹; Cui Yuyou¹; Yang Rui¹; ¹Institute of Metal Research, Chinese Academy of Sciences

4:55 PM

High Performance TiAl Alloys Realized by Spark Plasma Sintering: *Thomas Voisin*¹; Jean-Philippe Monchoux¹; Marc Thomas²; Helmut Clemens³; Alain Couret¹; ¹CEMES/CNRS; ²DMSN/ONERA; ³Montanuniversitat Leoben

5:15 PM

Microstructure and Mechanical Properties of TiAl Alloys Produced by Powder Metallurgy: *Fantao Kong*¹; Ning Cui¹; Ping Sun¹; Dezhong Wu¹; ¹Harbin Institute of Technology

High-temperature Gamma (f.c.c.) /Gamma-Prime (L12 structure) Co-Al-W Based Superalloys — Oxidation and Alloying Effects on Mechanical Behavior

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee

Program Organizers: David Seidman, Northwestern University; David Dunand, Northwestern University; Chantal Sudbrack, NASA Glenn Research Center; Carelyn Campbell, National Institute of Standards and Technology; Ursula Kattner, National Institute of Standards and Technology; David Dye, Imperial College

Monday PM Room: 5A
February 17, 2014 Location: San Diego Convention Center

Session Chairs: David Dunand, Northwestern University; David Dye, Imperial College

2:00 PM Plenary

Mechanical Properties of Co-based Superalloys with L₁₂ Cuboidal Precipitates: Haruyuki Inui¹; ¹Kyoto University

2:40 PM

High Temperature Oxidation of New γ/γ' Co-Al-W Based Superalloys: Leonhard Klein¹; Sannakaisa Virtanen¹; ¹University of Erlangen-Nürnberg

3:00 PM

Elementary Processes during the Oxidation of Ternary Co-base Superalloys: Martin Weiser¹; Sannakaisa Virtanen¹; ¹Friedrich-Alexander-Universitaet Erlangen-Nuernberg

3:20 PM Break

3:40 PM Invited

The Effect of Rhenium in Co-base Superalloys – A Comparison with Ni-base Superalloys: Steffen Neumeier¹; Christopher Zenk¹; Hamad Rehman¹; Mathias Goeken¹; ¹University of Erlangen-Nuremberg

4:10 PM

The Influence of Boron and Carbon on Grain Boundary Strength of γ' -Hardened Co-base Superalloys: Lisa Freund¹; Steffen Neumeier¹; Alexander Bauer¹; Mathias Göken¹; ¹University Erlangen-Nuernberg

4:30 PM

B and Zr Additions as Grain Boundary Strengtheners in a Model Co-based Superalloy: Peter Bocchini¹; Chantal Sudbrack²; Ronald Noebe²; David Dunand¹; David Seidman²; ¹Northwestern University; ²NASA Glenn Research Center

4:50 PM

Effect of Ti and Ta on the Creep Properties of Single Crystal Co-Al-W-base Superalloys: Fei Xue¹; Haijing Zhou¹; Xuhua Chen¹; Meiling Wang¹; Xianfei Ding¹; Qiang Feng¹; ¹University of Science and Technology Beijing

High-temperature Material Systems for Energy Conversion and Storage — Solid Oxide Fuel Cells I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Kyle Brinkman, Savannah River National Laboratory (SRNL); Xingbo Liu, West Virginia University; Kevin Huang, University of South Carolina

Monday PM Room: Carlsbad
February 17, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Kevin Huang, University of South Carolina; Kyle Brinkman, Savannah River National Laboratory (SRNL)

2:00 PM Invited

Advanced Anodes for Solid Oxide Fuel Cells: Fanglin (Frank) Chen¹; ¹University of South Carolina

2:30 PM Invited

Ionic Solid Oxides for High Temperature Optical Gas Sensing in Fossil Fuel Based Power Plants: Junhang Dong¹; Xiling Tang¹; Kurtis Remmel¹; Hongmin Jiang¹; ¹University of Cincinnati

3:00 PM Invited

Insights into the Structure and Functional Application of Sr₂CoMoO₆ for Solid Oxide Fuel Cells: Chunwen Sun¹; ¹Institute of Physics, Chinese Academy of Sciences

3:30 PM Break

3:55 PM

In Situ Study of Oxygen Exchange at Perovskite Electrode Surfaces in Different Environments: Monika Backhaus-Ricoult¹; ¹Corning Inc.

4:15 PM

Advanced Conductive Coating Process for Planar SOFC Stacks: Jung Pyung Choi¹; Jeffry Stevenson¹; Eric Riel¹; Jeff Bonnett¹; YS Chou¹; ¹Pacific Northwest National Laboratory

Hume-Rothery Award Symposium: Thermodynamics and Kinetics of Engineering Materials — Thermodynamic and Kinetic Modeling and Experiments

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Hans Juergen Seifert, Karlsruhe Institute of Technology (KIT); Alan Luo, The Ohio State University; Peter Uggowitzer, ETH Zürich; Fan Zhang, CompuTherm, LLC

Monday PM Room: 6C
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Zhang Yong, University of Science and Technology Beijing; André Schneider, Vallourec & Mannesmann Tubes

2:00 PM Invited

Solving Inverse Problems in Phase Stability: A Design Theoretic Approach: Raymundo Arroyave¹; Sean Gibbons¹; Edgar Galvan¹; Shengyen Li¹; Richard Malak¹; ¹Texas A & M University

2:20 PM

A Semi-Empirical Model to Implement Thermal and Electrical Conductivity of Metallic Systems into the CALPHAD Framework: Changdong Wei¹; Wolfgang Windl¹; Ji-Cheng Zhao¹; ¹The Ohio State University

2:40 PM

CALPHAD and Its Development for Materials Genome: Wei Xiong¹; Gregory B. Olson¹; Qing Chen²; Malin Selleby³; ¹Northwestern University; ²Thermo-Calc Software Company; ³KTH Royal Institute of Technology

3:00 PM Invited

Phase Reaction Equations and Their Applications: Shuanglin Chen¹; Weisheng Cao¹; Fan Zhang¹; Jun Zhu¹; Chuan Zhang¹; Rainer Schmid-Fetzer²; ¹CompuTherm, LLC; ²Clausthal University of Technology

3:20 PM Invited

Detecting Errors in Multicomponent Diffusivities Using One Diffusion Couple: John Morral¹; ¹The Ohio State University

3:40 PM Break

4:00 PM

Measurement of the Growth Rate of Solidifying Dendritic Grains Observed by Synchrotron Real-time X-ray Radiography: Arvind Prasad¹; Stuart McDonald¹; Kazuhiro Nogita¹; Kentaro Uesugi²; Hideyuki Yasuda³; David StJohn¹; ¹University of Queensland; ²JASRI; ³Kyoto University

4:20 PM Invited

Liquid Film Migration – Driving Force and Migration Direction: Markus Rettenmayr¹; ¹Friedrich Schiller University Jena

4:40 PM

Interdiffusion Microstructure Maps of Multi-component and Multi-phase Dual-alloy Systems: Xiaolin Ke¹; John Morral¹; Yunzhi Wang¹; ¹The Ohio State University



ICME: Linking Microstructure to Structural Design Requirements — ICME: Linking Microstructure to Structural Design Requirements II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Rajiv Mishra, University of North Texas; David Furrer, Pratt & Whitney; Peter Collins, University of North Texas; Charles Ward, Air Force Research Laboratory; Craig McClung, Southwest Research Institute

Monday PM Room: 31A
 February 17, 2014 Location: San Diego Convention Center

Session Chair: David Furrer, Pratt & Whitney

2:00 PM Invited

Linking ICME to Component Life Management during Design: *Craig McClung*¹; Michael Enright¹; ¹Southwest Research Institute

2:40 PM Invited

Toward Integrated Life-limit Materials Engineering of Turbine Engine Superalloys: *James Larsen*¹; Sushant Jha²; Reji John¹; Andrew Rosenberger¹; Dennis Buchanan³; William Porter³; Alisha Hutson³; Vikas Sinha⁴; Jay Jira¹; Siamack Mazdiyasn¹; ¹Air Force Research Laboratory; ²UTC; ³University of Dayton Research Institute; ⁴UES, Inc.

3:20 PM

A Microstructure-based Method of Predicting the Probability of Life-limiting Fatigue Failures: *Sushant Jha*¹; Christopher Szczepanski²; Robert Brockman³; Craig Przybyla²; Reji John²; James Larsen²; ¹Air Force Research Laboratory/Universal Technology Corporation; ²Air Force Research Laboratory; ³University of Dayton Research Institute

3:40 PM Break

4:00 PM

Probabilistic Prediction of Minimum Fatigue Life of a Shot Peened Titanium Alloy: *Reji John*¹; Sushant Jha²; James Larsen¹; ¹Air Force Research Laboratory; ²Universal Technology Corporation

4:20 PM

Computational and Experimental Evaluation of Effect of Primary Al₃Sc Particles on Fatigue Behavior of an Al-Mg-Sc Alloy: *Mageshwari Komarasamy*¹; Nilesh Kumar¹; Rajiv Mishra¹; ¹University of North Texas

4:40 PM

Microstructural Effects on the Cyclic Response of FCC Metallic Alloys – A Dislocation Dynamics Study: *Ranga Nikhil Yellakara*¹; Zhiqiang Wang¹; ¹University of North Texas

Light-metal Matrix (Nano)-composites — Microstructure-Property Relationships I

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee, TMS: Magnesium Committee
Program Organizers: Wim Sillekens, European Space Agency; Dmitry Eskin, Brunel University

Monday PM Room: 17B
 February 17, 2014 Location: San Diego Convention Center

Session Chair: Wim Sillekens, European Space Agency

2:00 PM Introductory Comments

2:10 PM Keynote

An Insight into Processing and Characteristics of Magnesium-based Composites: *Manoj Gupta*¹; ¹National University of Singapore

2:40 PM

Effect of Process Control Agent on the Microstructure and Mechanical Behavior of an Aluminum and B4C Metal Matrix Composite: *Clara Hofmeister*¹; Anit Giri²; Sarah Brennan²; Timothy Delahanty³; Yongho Sohn¹; Kyu Cho²; ¹UCF; ²U.S. Army Research Laboratory, Weapons & Materials Research Directorate; ³Pittsburgh Materials Technology, A Division of

Thermacore

3:00 PM

Hot Extruded Carbon Nanotube Reinforced Magnesium Matrix Composites and Its Microstructure, Mechanical and Corrosion Properties: *Harun Mindivan*¹; Arife Efe¹; Eyup Kayali²; ¹Ataturk University; ²Istanbul Technical University

3:20 PM Break

3:40 PM

Microstructure and Damping Properties of Al Wires Reinforced by Al₂O₃ Nanoparticles: *Riccardo Casati*¹; Maurizio Vedani¹; Ausonio Tuissi²; Elena Villa²; Xianshun Wei³; Kenong Xia³; ¹Politecnico di Milano; ²CNR-IENI; ³University of Melbourne

4:00 PM

Elevated Temperature Deformation Behavior of High Strength Al-Cu-Mg-Ag Based Alloy Reinforced by TiB₂ Particles: *Martha Indriyati*¹; Vit Janik¹; Richard J. Dashwood¹; ¹University of Warwick

4:20 PM

Hardening and Softening Processes in an AJ51 Magnesium Alloy Reinforced with Short Saffil Fibres: *Zuzanka Trojanova*¹; Kristián Máthi¹; Gergely Farkas¹; ¹Charles University

4:40 PM

Understanding the Role of Nanodispersion on the Properties of A390 Hyper-eutectic AlSi Cast Alloy: *Iman El Mahallawi*¹; Othman Othman¹; Mohamed Abdelaziz²; Hossam Raed¹; Tareq Abd El-Fattah¹; Sherif Nasr²; ¹Cairo University; ²British University, Egypt

5:00 PM

Effects of AlB₂ Particles and Zinc on the Mechanical Properties of a Series of Aluminum Matrix Composites: *Marcos Corchado*¹; Fernando Reyes²; Marivic Hernández¹; O. Marcelo Suárez³; ¹Mechanical Engineering Department, University of Puerto Rico, Mayagüez; ²Industrial Engineering Department, University of Puerto Rico, Mayagüez; ³General Engineering Department, University of Puerto Rico, Mayagüez

Long-term Stability of High Temperature Materials — Phase Changes in Bulk Material II and Surface Degradation

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee

Program Organizers: Mark Hardy, Rolls-Royce plc; Awadh Pandey, Pratt & Whitney Rocketdyne; David Mourer, General Electric Aircraft Engines; Jeffrey Hawk, National Energy Technology Laboratory

Monday PM
 February 17, 2014

Room: 4
 Location: San Diego Convention Center

Session Chairs: David Mourer, GE Aircraft Engines; Awadh Pandey, Pratt & Whitney Rocketdyne

2:00 PM

Long Term Stability of the Rene 65 Cast and Wrought Nickel Superalloy: *Andrew Wessman*¹; ¹GE Aviation

2:20 PM

The Coarsening Behavior of NiAl Precipitates in NiAl-strengthened Ferritic Alloys at 973 and 1,073 K: *Zhiqian Sun*¹; Jan Ilavsky²; Gian Song¹; Gongyao Wang¹; Peter Liaw¹; ¹The University of Tennessee; ²Advanced Photon Source, Argonne National Laboratory

2:40 PM

Investigating Oxidation and Oxygen Transport in an Advanced Polycrystalline Nickel-based Superalloy Under Static Loads: Benjamin Foss¹; *Barbara Shollock*¹; David McPhail¹; Mark Hardy²; ¹Imperial College London; ²Rolls-Royce plc

3:00 PM

Combinatorial Assessment of the Oxidation Behavior of Titanium Alloys: *Peyman Samimi*¹; David Brice¹; Peter Collins¹; ¹University of North Texas

3:20 PM Break

3:40 PM

Bond Coat Cavitation under CMAS-Infiltrated Thermal Barrier Coatings: *Kaylan Wessels¹; R. Jackson¹; Douglas Konitzer²; Matthew Begley¹; Tresa Pollock¹; Carlos Levi¹; ¹University of California, Santa Barbara; ²GE Aviation*

4:00 PM

Oxide Recession in High-temperature High-velocity Water Vapor: *Robert Golden¹; Elizabeth Opila¹; ¹University of Virginia*

4:20 PM

Diffuse Interface Modeling on Thermal Oxidation of Metals: *Tian-Le Cheng¹; You-Hai Wen¹; Jeffrey Hawk¹; ¹National Energy Technology Laboratory*

4:40 PM

The Oxidation-resistance Properties of Iron-based Superalloys between 1473 and 1523K: *Xuan Chen¹; ¹Shanghai University*

Magnesium Technology 2014 — Powders, Recycling, Hydrometallurgy, Primary Production, and Creep

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Monday PM

February 17, 2014

Room: 17A

Location: San Diego Convention Center

Session Chairs: Neale Neelameggham, IND LLC; Petra Maier, Fachhochschule Stralsund - University of Applied Sciences

2:00 PM

Emerging Applications Using Mg Alloy Powders: A Feasibility Study: *Rajiv Tandon¹; Deepak Madan¹; ¹Magnesium Elektron Powders*

2:20 PM

Isothermal Hydrogenation Kinetics Study of Magnesium Hydride with TiH₂ Additive: *Jingzhu Li¹; Peng Fan¹; Zak Fang¹; Chengshang Zhou¹; ¹University of Utah*

2:40 PM

Recovery of Rare Earth Metals in Used Magnets by Molten Magnesium: *Tomohiko Akahori¹; Yu Miyamoto¹; Tomonori Saeki¹; Masahide Okamoto¹; Toru Okabe²; ¹Hitachi.Ltd; ²The University of Tokyo*

3:00 PM

Recovery of Magnesium and Recycling of Spent Solution in Chloride-based Atmospheric Acid Leaching of Laterite: *Yong Ge¹; Weizhong Ding¹; Dingsheng Tan¹; Shuqiang Guo¹; ¹Shanghai Key Laboratory of Modern Metallurgy & Materials Processing, Shanghai University*

3:20 PM Break

3:40 PM

Effect of Physical Properties of Dolomite on Carbothermic Reduction: *Siya Wang¹; Yu Wang¹; Guangyong Bin¹; Jiang Diao¹; ¹College of Materials Science and Engineering, Chongqing University*

4:00 PM

Time Dependent Springback of a Magnesium Alloy: *Bin Li¹; Zackery McClelland¹; S.J. Horstemeyer¹; Imran Aslam¹; P.T. Wang¹; M.F. Horstemeyer¹; ¹Center for Advanced Vehicular Systems*

4:20 PM

Precipitate Formation in Uniaxially Stressed High Pressure Die Cast Binary Mg-Nd Alloy during Creep Testing: *Deep Choudhuri¹; Nilesh Dendge¹; Soumya Nag¹; Mark Gibson²; Rajarshi Banerjee¹; ¹University of North Texas; ²CAST CRC and CSIRO Process Science & Engineering*

4:40 PM

A Review of the Influence of Production Methods and Intermetallic Phase on the Creep Properties of AZ₉₁: *Peiman Shahbeigi Roodposhti¹; Korukonda Murty¹; Apu Sarkar¹; ¹North Carolina State University*

5:00 PM

Indentation Creep Behavior of Mg-10Gd-3Y-0.5Zr (wt.%) Alloy at Elevated Temperatures: *Huan Wang¹; Qudong Wang¹; Jie Yuan¹; ¹Shanghai Jiao Tong University*

5:20 PM

Consolidation of Blended Magnesium Powders by Microwave Processing: *M. Ashraf Imami¹; Benjamin Rock¹; Arne Fliflet¹; Jerry Feng¹; ¹Naval Research Laboratory*

Magnetic Materials for Energy Applications IV — Rare Earth Permanent Magnets: Processing, Characterization and Modeling

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Thomas G. Woodcock, IFW Dresden; Julia Lyubina, Evonik Industries AG; Matthew Willard, Case Western Reserve University

Monday PM

February 17, 2014

Room: Ballroom G

Location: San Diego Marriott Marquis & Marina

Session Chairs: Thomas G. Woodcock, IFW Dresden; Ralph Skomski, University of Nebraska-Lincoln

2:00 PM Invited

Magnetic Materials for Green Innovation: *Michael Coey¹; ¹Trinity College Dublin*

2:30 PM Invited

Microstructure and Coercivity Relationships of Anisotropic Hot-deformed Nd-Fe-B Magnets: *Hossein Sepehri Amin¹; J. Liu²; T. Akiya¹; T. Ohkubo¹; K. Hioki³; A. Hattori³; K. Hono¹; ¹Elements Strategy Initiative Center for Magnetic Materials, National Institute for Materials Science; ²Graduate School of Pure and Applied Sciences, University of Tsukuba; ³Daido Corporate Research & Development Center, Daido Steel Co. Ltd.*

3:00 PM

Coercivity Enhancement of NdFeB Sintered Magnet by Grain Refinement

: Jin Woo Kim¹; Seong Yeul Kwak¹; Seok Hyun Hwang¹; Young Do Kim¹; ¹Hanyang University

3:20 PM

Incorporating Dy in Rare-earth Magnets Through a Low Melting Dy-rich Phase: *Peter Moran¹; Stephen Hackney¹; Jie Li¹; Li Chen¹; ¹Michigan Technological University*

3:40 PM Break

3:55 PM

Microstructure of HRE Grain Boundary Diffusion Processed Nd-Fe-B Sintered Magnets: *U. M. R. Seelam¹; T. Ohkubo¹; T. Abe¹; S. Hirose¹; Kazuhiro Hono¹; ¹National Institute for Materials Science*

4:15 PM Invited

What Micromagnetics Tells Us about the Coercive Field of Permanent Magnets: *Thomas Schrefl¹; Simon Bance¹; Tetsuya Shoji²; Masao Yano²; Akira Manabe²; ¹St. Poelten University of Applied Sciences; ²Toyota Motor Corporation*

4:45 PM Invited

Ab Initio to Continuum Modelling of Nd-Fe-B Magnets and Interfaces: *Gino Hrkač¹; Thomas Woodcock²; Oliver Gutfleisch³; Richard Evans⁴; Roy Chantrell⁴; Thomas Schrefl⁵; ¹University of Exeter; ²IFW Dresden; ³TU Darmstadt; ⁴University of York; ⁵University of Applied Sciences*

5:15 PM Invited

Formation of the Fcc-NdO_x Phase at Nd/Nd-Fe-B Interface: First-principles Modeling: *Ying Chen¹; Arkapol Saengdeejeing¹; Ken Suzuki¹; Hideo Miura¹; Satoshi Sugimoto¹; ¹Tohoku University*



Materials and Fuels for the Current and Advanced Nuclear Reactors III — Fuels II

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

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Monday PM Room: 33C
February 17, 2014 Location: San Diego Convention Center

Session Chair: Dennis Keiser, Idaho National Laboratory

2:00 PM Invited

Accident Tolerant Fuels for Light Water Reactors: *Steven Zinkle*¹; Kurt Terrani¹; Lance Snead¹; ¹Oak Ridge National Laboratory

2:25 PM

Modifying Ceramic Fuel Pellets to Improve UO₂ Properties: *Rafael Leckie*¹; Erik Luther¹; Ken McClellan¹; Pallas Papin¹; Tom Wynn¹; ¹Los Alamos National Laboratory

2:40 PM

Development of Fabrication Process Methodologies for Ceramic Fuel Pellets: *Erik Luther*¹; Ken McClellan¹; Rafael Leckie¹; Pallas Papin¹; Thomas Wynn¹; ¹LANL

2:55 PM

Fabrication and Properties of High Thermal Conductivity UO₂, UO₂-SiC, UO₂-Diamond, and UO₂-CNT Composites Using Spark Plasma Sintering: *Ghatu Subhash*¹; ¹University of Florida

3:10 PM Invited

Lab-scale Methods to Enable the Selection of Nuclear Fuel Concepts for Development: *Sean McDevitt*¹; ¹Texas A&M University

3:35 PM Break

3:50 PM Invited

Interatomic Potentials Accuracy: How Do They Bridge the Scales? U-Mo Fuel Case: *Vladimir Stegailov*¹; Daria Smirnova¹; Alexey Kuksin¹; Sergey Starikov¹; ¹Joint Institute for High Temperatures RAS, MIPT

4:15 PM

Atomistic Investigation of Ionic Conductivity in Chorium-doped Urania Fuel: *Richard Hoffman III*¹; Rakesh Behera¹; Chaitanya Deo¹; ¹Georgia Institute of Technology

4:30 PM

Synthesis of U₃Si₂ by High-energy Ball Milling: *Gordon Alanko*¹; Brian Jaques¹; Darryl Butt¹; ¹Boise State University

5:00 PM

Microstructure of Aluminum Matrix in Composite Absorber Block Material: *Donna Guillen*¹; Jatuporn Burns²; ¹Idaho National Laboratory; ²Boise State University-Idaho Falls

4:45 PM

Ion Irradiation Enhanced Interdiffusion in Uranium-iron System: *Tianyi Chen*¹; Bulent Sencer²; Lin Shao¹; Rory Kennedy²; ¹Texas A&M University; ²Idaho National Laboratory

5:15 PM

Sink Strengths of Grain Boundaries in Irradiated Nanocrystalline Materials: *Chao Jiang*¹; Narasimhan Swaminatham²; Dane Morgan¹; Izabela Szlufarska¹; ¹University of Wisconsin; ²Indian Institute of Technology Madras

Materials Processing Fundamentals — Process & Properties Control

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: James Yurko, Materion Brush Beryllium and Composites; Lifeng Zhang, University of Science and Technology Beijing; Antoine Allanore, Massachusetts Institute of Technology; Cong Wang, Northwestern University

Monday PM Room: 11B
February 17, 2014 Location: San Diego Convention Center

Session Chair: James Yurko, Materion

2:00 PM

Determination of Processing Window for the In Situ Control of Microstructure of Cold-sprayed Materials: *Jonghyun Lee*¹; Robert Hyers¹; David Schmidt¹; ¹University of Massachusetts

2:20 PM

Simulating Particle Impact to Predict the Mechanical Properties of Cold Sprayed Alloys: *Luke Bassett*¹; Richard Sisson¹; Victor Champagne²; Diran Apelian¹; ¹Worcester Polytechnic Institute; ²Army Research Laboratory

2:40 PM

Preliminary Investigations into the Ultra-rapid Manufacturing of Micro/Nano-scale Materials: *K. Stewart*¹; D. Cavero¹; S Weerasuriya¹; K. Morsi¹; ¹San Diego State University

3:00 PM

Effect of Different Parameters on Breakouts in Billet Caster: *Ram Singh*¹; ¹National Institute of Technology, Jamshedpur

3:20 PM Break

3:35 PM

Numerical Investigation of the Pressure Effects on Thermal Behavior during Spark Plasma Sintering: *Alan Williamson*¹; Baolong Zheng¹; Enrique Lavernia¹; Joanna Groza¹; Jean-Pierre Delplanque¹; ¹University of California, Davis

3:55 PM

Initial Stage Kinetics of Oxide Dispersion Strengthened Alloys Sintered by Spark Plasma Sintering: *Kerry Allahar*¹; Jatuporn Burns¹; Yaqiao Wu¹; Brian Jaques¹; Darryl Butt¹; ¹Boise State University

4:15 PM

Microstructure Evolution in Nano-reinforced Ferritic Steel Processed by Mechanical Alloying and Spark Plasma Sintering: *Xavier Boulнар*¹; Damien Fabrègue²; Michel Perez²; Marie-Hélène Mathon³; Thierry Douillard²; Yann de Carlan¹; ¹CEA, DEN; ²INSA Lyon - MATEIS; ³Laboratoire Leon Brillouin

4:35 PM

Effect of Porosity on Phase Transformation and Mechanical Behaviors of Powder Metallurgy Steels: *Jooyoung Park*¹; Gowoon Jeong¹; Singon Kang¹; Donghyun Bae¹; Hyunjoo Choi¹; ¹Kookmin University; ²Yonsei University

Mechanical Behavior at the Nanoscale II — Nanostructured Materials

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Monday PM
February 17, 2014

Room: 9
Location: San Diego Convention Center

Session Chairs: Daniel Gianola, University of Pennsylvania; Daniel Kiener, University of Leoben

2:00 PM Invited

Size Effects on the Martensitic Transformation in Shape Memory Alloy Microwires: Stian Ueland¹; Nihan Tuncer¹; *Christopher Schuh*¹; ¹MIT

2:30 PM Invited

Nanostructured Metallic Muscles at Work: *Jeff De Hosson*¹; Eric Detsi¹; Patrick Onck¹; ¹University of Groningen

3:00 PM

Nanoporous Au(Pt) with Electrochemically Tunable Strength: Xing-Long Ye¹; *Hai-Jun Jin*¹; ¹Institute of Metal Research, Chinese Academy of Sciences

3:20 PM

Load Drop and Slip Step Statistics in Cast Aluminium and Magnesium Microwires: Jerome Krebs¹; Suzanne Verheyden¹; *Andreas Mortensen*¹; ¹Ecole Polytechnique Fédérale de Lausanne (EPFL)

3:40 PM Break

3:55 PM Invited

Atomic-scale Processes in Friction and Wear: *Robert Carpick*¹; ¹University of Pennsylvania

4:25 PM

Atomistic Scale Observation on Deformation in Angstrom-sized Twin Gold Nanowires: *Scott Mao*¹; Jiangwei Wang¹; Frederic Sansoz²; Jianyu Huang; ¹University of Pittsburgh; ²The University of Vermont

4:55 PM

In Situ TEM Compression of Co₂₃at.%Ti Metallic Glasses: *Christoph Gammert*¹; Christian Rentenberger²; David Geist²; Hans-Peter Karnthaler²; Andrew Minor¹; ¹Department of Materials Science and Engineering, University of California, Berkeley and National Center for Electron Microscopy, Lawrence Berkeley National Laboratory; ²Physics of Nanostructured Materials, University of Vienna

5:15 PM

Strain Localization in Amorphous Metallic Nanowires: Molecular Dynamics Simulations on the Influence of Size, Surface Relaxation State and Temperature: *Karsten Albe*¹; Yvonne Ritter¹; ¹TU Darmstadt

Mechanical Behavior Related to Interface Physics II — Interfacial Effects on Fracture and In situ Straining

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Nan Li, Los Alamos National Laboratory; Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Tonya Stone, Mississippi State University

Monday PM
February 17, 2014

Room: 11A
Location: San Diego Convention Center

Session Chairs: Nan Li, Los Alamos National Laboratory; Michael Demkowicz, Massachusetts Institute of Technology

2:00 PM Introductory Comments

2:05 PM Invited

Molecular Dynamics Based Study and Characterization of Deformation Mechanisms near a Crack in a Crystalline Material: *Somnath Ghosh*¹; Jiayi Zhang¹; ¹Johns Hopkins University

2:35 PM

The Effects of Grain Boundary Volume Fraction and Relaxation State on Uniaxial Plasticity of Nanocrystalline Metals: *Amirhossein Khalajhedayati*¹; Timothy Rupert¹; ¹University of California Irvine

2:55 PM

Atomistic Simulation on the Structure and Mechanical Response of $\Sigma 3$, $\Sigma 5$ Tilt Grain Boundaries under Tension: *Liang Zhang*¹; Cheng Lu¹; Kiet Tieu¹; Xing Zhao¹; Linqing Pei¹; Kuiyu Cheng¹; ¹Faculty of Engineering and Information Sciences, University of Wollongong

3:15 PM Invited

Disclinations and the Mechanical Properties of Polycrystals: *Michael Demkowicz*¹; Guoqiang Xu¹; ¹Massachusetts Institute of Technology

3:45 PM Break

3:55 PM Invited

In Situ TEM Observations of Surface and Interface Phenomena during Nanomechanical Testing: *Andrew Minor*¹; ¹UC Berkeley & LBL

4:25 PM

Investigation of Deformation in Al-Mg Alloys Using a Combined In Situ TEM Deformation/Dislocation Tomography Approach: *Josh Kacher*¹; Peter Ercius²; Raja Mishra³; Andrew Minor¹; ¹University of California, Berkeley; ²National Center for Electron Microscopy; ³General Motors Research and Development

4:45 PM

In Situ TEM Study of Dislocation-precipitate Interactions in Alpha Titanium-oxygen Solid Solutions: *Rachel Traylor*¹; Qian Yu¹; David Rugg²; John Morris¹; Andrew Minor¹; ¹University of California Berkeley; ²Rolls Royce

5:05 PM Invited

Visualizing Displacive Versus Diffusive Plasticity of Sn: From “Smaller is Stronger” to “Smaller is Much Weaker”: Lin Tian¹; Ju Li²; Jun Sun¹; Evan Ma³; *Zhiwei Shan*¹; ¹Xi'an Jiaotong University; ²MIT; ³Johns Hopkins University



Nanostructured Materials for Rechargeable Batteries and Supercapacitors II — Session II

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: David Mitlin, University of Alberta and NINT NRC; Reza Shahbazian-Yassar, Michigan Technological University; Peter Kalisvaart, University of Alberta and NINT NRC

Monday PM
February 17, 2014

Room: Ballroom F
Location: San Diego Marriott Marquis & Marina

Session Chairs: Reza Shahbazian-Yassar, Michigan Technological University; David Mitlin, University of Alberta

2:00 PM Invited

Neutron Depth Profiling of Lithium Transport in All-solid-state Batteries: *Peter Notten*¹; ¹Eindhoven University

2:15 PM Invited

Computer Simulation Study of Supercapacitors Based on Reduced Graphene Oxide Electrodes: *Hyung Kim*¹; Andrew DeYoung¹; Sang-Won Park²; YounJoon Jung²; ¹Carnegie Mellon University; ²Seoul National University

2:30 PM Invited

Designing 3D Conical-Shaped Li-ion Micro-batteries: Daw Gen Lim¹; R. Edwin Garcia¹; ¹Purdue University

2:45 PM

Direct Spark Plasma Erosion Synthesis of Tin and silicon Alloy Nanoparticulate Materials for Lithium Ion Batteries: *Emma White*¹; Jordan Vetter²; Lisa Rueschhoff²; Steve Martin²; Iver Anderson¹; ¹Ames Laboratory & Iowa State University; ²Iowa State University

3:00 PM Invited

A Vertical Carbon Nanofiber Architecture for Li-ion Batteries and Supercapacitors: *Jun Li*¹; ¹Kansas State University

3:15 PM Invited

Graphene-based Materials in Electrodes and Separators in Advanced Li-based Batteries: *Harold Kung*¹; Mayfair Kung¹; ¹Northwestern University

3:30 PM Break

3:45 PM Invited

Current State of Lithium-sulfur Batteries: *Ilias Belharouak*¹; Rui Xu¹; ¹Argonne National Laboratory

4:00 PM Invited

Fabrication of Three-dimensional, Solid-state Lithium-ion Batteries Using All Aqueous Based Processes: *Derek Johnson*¹; Amy Prieto²; ¹Prieto Battery, Inc.; ²Colorado State University

4:15 PM Invited

Electrochemical Energy Storage in Polymer-based Electrodes: Opportunities and Challenges: *Jodie Lutkenhaus*¹; ¹Texas A&M University

4:30 PM Invited

Developing and Understanding Earth-abundant Iron-based Conversion Cathode Nanomaterials for High Energy-Density Lithium-ion Batteries: Linsen Li¹; *Song Jin*¹; ¹University of Wisconsin-Madison

4:45 PM Invited

Nanoscale Materials Designing Concept Based on In Situ TEM Study of Structural and Chemical Evolution of Electrode in Electrochemical Cell: *Chongmin Wang*¹; ¹Pacific Northwest National Laboratory

5:00 PM Invited

Polymer Nanocomposite Electrolytes for Flexible Lithium Ion Batteries: *Haleh Ardebili*¹; ¹University of Houston

5:15 PM Invited

Carbon Nanotube Enhanced Lithium Ion Batteries: *Brian Landi*¹; Michael Forney¹; Matthew Ganter¹; Jason Staub¹; ¹Rochester Institute of Technology

Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World — Complex Materials

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

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH; Brent Fultz, California Institute of Technology; Peter Liaw, The University of Tennessee

Monday PM
February 17, 2014

Room: 10
Location: San Diego Convention Center

Session Chairs: Mike Manley, ORNL; Brent Fultz, CALTECH

2:00 PM Keynote

Atomic Dynamics and Viscosity in the Liquid: *Takeshi Egami*¹; ¹University of Tennessee

2:40 PM Invited

Resonant Intrinsic Local Modes and Disorder as Generators of Relaxor Ferroelectric Behavior: *Michael Manley*¹; ¹Oak Ridge National Laboratory

3:05 PM Invited

In-situ Nanofocused X-ray Diffraction in Combination with Atomic Force Microscopy for In-situ Mechanical Testing of Nanostructures: *Thomas Cornelius*¹; Z. Ren¹; F. Mastropietro¹; A. Davydok¹; M.-I. Richard¹; Olivier Thomas; S. Langlais²; M. Dupraz²; G. Beutier²; M. Verdier²; ¹Aix-Marseille Université, CNRS, IM2NP; ²SIMaP, Grenoble Institute of Technology & CNRS

3:30 PM Invited

Development of Synchronized LPSO Microstructures in MgREZn System Examined by SWAXS: *Hiroshi Okuda*¹; Toshiki Horiuchi¹; Michiaki Yamazaki²; Yoshihito Kawamura²; Shinji Kohara³; Shigeru Kimura³; ¹Kyoto University; ²Kumamoto University; ³Spring-8

3:55 PM Break

4:05 PM Invited

Three-dimensional Coherent X-ray Surface Scattering Imaging: *Jin Wang*¹; Tao Sun¹; Zhang Jiang¹; Joseph Strzalka¹; Leonidas Ocola²; ¹X-ray Science Division, Argonne National Laboratory; ²Center for Nanoscale Materials, Argonne National Laboratory

4:30 PM Invited

Coherent Diffraction Imaging of Strain on the Nanoscale: *Ross Harder*¹; ¹Argonne National Lab

4:55 PM Invited

The Invar Systems Fe-Pd and Fe-Pt: *Bernd Schoenfeld*¹; ¹ETH Zurich

5:20 PM

Structure and Composition Determination in Fluctuation X-ray Scattering using Angular Autocorrelation Function as Signature: *Dongsheng Li*¹; ¹Pacific Northwest National Laboratory

Pb-free Solders and Emerging Interconnect and Packaging Materials — Alloying Additions

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch Automotivve

Monday PM
February 17, 2014

Room: 5B
Location: San Diego Convention Center

Session Chairs: Tae-Kyu Lee, Cisco Company; Albert Wu, National Central University

2:00 PM

Liquidus Projection of Sn-Ag-Co-Ni Alloys: Sinn-wen Chen¹; Tung-Kai Chen¹; Chia-ming Hsu²; Jui-shen Chang¹; *Ssu-ming Tseng*³; Kevin Pan¹; ¹National Tsing Hua University; ²National United University; ³National Tsing Hua University

2:20 PM

Effect of Silver Content in SAC Solder on the Interfacial Reaction and Reliability of the angle Joints Fabricated by Laser-jet Soldering: *Hongjun Ji*¹; Mingyu Li¹; ¹Harbin Institute of Technology Shenzhen Graduate School

2:40 PM

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-Villafañe¹; Caleb Carreño-Gallardo¹; ¹CIMAV, S.C.

3:00 PM

Effects of Minor Alloying Element Addition on Ni-Sn Interfacial Reaction under Space Confinement: *Jen-Jui Yu*¹; Wen-Lin Shih¹; C. Robert Kao¹; ¹National Taiwan University

3:20 PM Break

3:40 PM

Nucleation and Growth of Cu₃₃Al₁₇ in Al Modified Sn-Ag-Cu and Sn-Cu Pb-free Solder Alloys: *Kathlene Lindley*¹; Iver Anderson²; ¹Purdue University; ²Ames Laboratory (USDOE)

4:00 PM

Heterogeneous Nucleation of Intermetallics in Pb-free Soldering: *Christopher Gourlay*¹; Sergey Belyakov¹; ¹Imperial College London

4:20 PM

Challenges for Scaling of Solder Micro-bump: *Fay Hua*¹; Yoshihiro Tomita¹; Eric Li¹; Raul Mancera¹; Mike Todd¹; ¹Intel Corporation

4:40 PM

Synthesis of Tin/Indium (Sn/In) Lead-free Nanosolder Particles and Their Application for Low Temperature Soldering: *Yang Shu*¹; Karunaharan Rajathurai¹; Fan Gao¹; Qingzhou Cui¹; Zhiyong Gu¹; ¹University of Massachusetts Lowell

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIII — Phase Equilibria and Transformations of the Pb-free Solders and Energy Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Chao-hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikuro Ohnuma, Tohoku University; Clemens Schmetterer, Forschungszentrum Juelich, Inst.; Yee-Wen Yen, National Chung Cheng University; Shien Ping Feng, The University of Hong Kong; Shih-Kang Lin, National Cheng Kung University

Monday PM
February 17, 2014

Room: 32A
Location: San Diego Convention Center

Session Chairs: Clemens Schmetterer, Forschungszentrum Juelich, Inst.; Cheng-En Ho, Yuan-Ze University

2:00 PM Invited

CoSb₃-InSb Isolethal Section of Co-Sb-In Ternary Phase Diagram: *Sinn-wen Chen*¹; Ssu-ming Tseng¹; Jui-shen Chang¹; G. Snyder²; ¹National Tsing Hua University; ²California Institute of Technology

2:20 PM Invited

High-temperature Soft Solders: The Ni-Sn-Zn Phase Diagram: *Clemens Schmetterer*¹; Hans Flandorfer²; ¹Forschungszentrum Juelich GmbH; ²University of Vienna

2:40 PM

The System Cu-Li-Sn: Phase Diagram and Thermochemistry: *Siegfried Fürtauer*¹; Andriy Yakymovych¹; Erdenebat Tserenjav²; Herbert Ipser¹; Hans Flandorfer¹; ¹University of Vienna; ²National University of Mongolia

3:00 PM

Liquidus Projection of Thermoelectric Ag-Sn-Te Ternary System: *Jui-Shen Chang*¹; Sinn-wen Chen¹; Kuo-chun Chiu¹; Hsin-jay Wu¹; Jee-jay Chen¹; ¹National TsingHua University

3:20 PM

Exploring Nature's Missing Li₄Me₅O₁₂ Defect Spinel Oxides by Ab Initio Calculations: *Ping-chun Tsai*¹; Shih-kang Lin¹; Wen-Dung Hsu¹; ¹National Cheng Kung University (NCKU)

3:40 PM Break

4:00 PM Invited

Interaction of Sn-Sb Based Solders with Nickel: Phase Equilibria in the Ternary Ni-Sb-Sn System: Ales Kroupa¹; Ratikanta Mishra²; Divakar Rajamohan³; Hans Flandorfer³; Andrew Watson⁴; *Herbert Ipser*³; ¹Institute of Physics of Materials; ²Bhabha Atomic Research Centre; ³University of Vienna; ⁴University of Leeds

4:20 PM Invited

Thermodynamic and Phase Relations of Intermetallic Anode Materials for Li-ion Accumulators: *Hans Flandorfer*¹; Siegfried Fürtauer¹; Damian Cupid²; Torsten Markus³; Herbert Ipser¹; ¹University of Vienna; ²Karlsruhe Institute of Technology; ³Research Center Jülich

4:40 PM Invited

Thermochemical Investigations on Phase Stabilities for Electrode Materials of Advanced Li-ion Batteries: *Torsten Markus*¹; David Henriques¹; Marco Prill¹; Siaufung Dang¹; Clemens Schmetterer¹; ¹Forschungszentrum Juelich GmbH

5:00 PM Invited

Thermodynamic Investigation of the Lithium-silicon-oxygen System for Lithium Ion Batteries: *Damian Cupid*¹; Alexandra Reif¹; Hans Seifert¹; ¹Karlsruhe Institute of Technology



Phase Transformation and Microstructural Evolution — Fundamentals of Diffusion in Transformations in Steels

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Monday PM Room: 31C
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Christopher Hutchinson, Monash University; Hatem Zurob, McMaster University

2:00 PM Invited

Re-examination of Thermodynamic Properties of Cementite Using CVM Calculations: *Hiroshi Ohtani*¹; Satoshi Iikubo²; ¹Tohoku University; ²Kyushu Institute of Technology

2:30 PM Invited

Theoretical Modeling of Precipitation Kinetics in Steels: *Qing Chen*¹; Kaisheng Wu²; Gustaf Sterner¹; Johan Bratberg¹; Anders Engström¹; Paul Mason²; ¹Thermo-Calc Software AB; ²Thermo-Calc Software Inc

3:00 PM Invited

Role of Interstitials on the Diffusion of Substitutional Solutes in Ferrite: *Marcel Sluiter*¹; ¹TU Delft

3:30 PM Break

3:45 PM

Austenite-ferrite Transformation: A Coarse-graining Monte Carlo Model: *Adeline Maitre*¹; Renaud Patte²; Frederic Danoix²; Doug Ivey¹; Helena Zapolosky²; Hani Henein¹; ¹University of Alberta; ²Université et INSA de Rouen

4:05 PM Invited

Self-consistent Model for Planar Ferrite Growth in Fe-C-X Alloys: Damon Panahi¹; Cong Qui²; Christopher Hutchinson²; Gary Purdy¹; *Hatem Zurob*¹; ¹McMaster University; ²Monash University

4:35 PM Invited

Pearlite Growth and Manganese Partitioning in 9Mn Steel: Maria Aranda¹; *Carlos Capdevila-Montes*¹; Michael Miller²; Robert Hackenberg³; Esteban Urones-Garrote⁴; ¹CENIM-CSIC; ²ORNL; ³LANL; ⁴CNME

5:05 PM Invited

γ/α Transformation Behaviors in C Composition Gradient Diffusion Couples in the Fe-C-Mn System: *Ikuo Ohnuma*¹; Takuya Nakagawa¹; Toshihiro Omori¹; Kiyohito Ishida¹; Ryosuke Kainuma¹; ¹Tohoku University

5:35 PM

Microstructural Aging of a Precipitation Hardened Martensitic Stainless Steel: *Laurent Couturier*¹; Frederic De Geuser¹; Alexis Deschamps¹; Jonathan Hugues²; Eric Andrieu²; ¹SIMAP - Grenoble INP - UJF - CNRS; ²CIRIMAT - INP Toulouse

Progress Towards Rational Materials Design in the Three Decades Since the Invention of the Embedded Atom Method: An MPMD Symposium in Honor of Dr. Michael I Baskes — Interatomic Potentials and Applications

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Srinivasan Srivilliputhur, University of North Texas; Amit Misra, Los Alamos National Laboratory; Neville Moody, Sandia National Laboratories; Stephen Foiles, Sandia National Laboratories; Mark Asta, University of California; Alan Needleman, University of North Texas

Monday PM Room: 30E
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Murray Daw, Clemson University; Stephen Foiles, Sandia National Laboratories; Susan Sinnott, University of Florida

2:00 PM Invited

Resources for the Selection and Use of Interatomic Potentials in Atomistic Simulations: *Chandler Becker*¹; Zachary Trautt¹; ¹NIST

2:20 PM Invited

Development of EAM Potentials Suitable for Simulation of Crystal Defect and Liquid Properties: *Mikhail Mendeleev*¹; ¹Ames Laboratory

2:40 PM

A New Approach for Interatomic Potentials: Application to Tantalum: *Stephen Foiles*¹; Garritt Tucker¹; Aidan Thompson¹; Laura Swiler¹; Christian Trott¹; ¹Sandia National Laboratories

3:00 PM

Atomistic Potentials for Palladium-silver Hydrides: Lucas Hale¹; Bryan Wong²; *Jonathan Zimmerman*¹; Xiaowang Zhou¹; ¹Sandia National Laboratories; ²Drexel University

3:20 PM Break

3:30 PM Invited

Embedded Atom Method Insight into the Phase Stability of Alloys: *Marius Stan*¹; Zhi-Gang Mei¹; ¹Argonne National Laboratory

3:50 PM Invited

Fitting and Testing of Interatomic Potentials for Modeling Material Behavior in Extreme Environments: *Ramon Ravelo*¹; ¹University of Texas-El Paso

4:10 PM

Effects of Vacancy on Generalized Stacking Fault Energy of Metals: *Ebrahim Asadi*¹; Mohsen Asle Zaeem¹; Amitava Moitra²; Mark Tschopp³; ¹Missouri University of Science and Technology; ²S. N. Bose National Centre for Basic Sciences; ³Army Research Laboratory

4:30 PM

Analytic Bond-order Potentials for Dynamical Simulations: *Thomas Hammerschmidt*¹; Bernhard Seiser²; Miroslav Cak¹; David G. Pettifor²; Ralf Drautz¹; ¹ICAMS, Ruhr-University Bochum; ²MML, University of Oxford

4:50 PM

The Environment Dependent Dynamic Charge Potential: *Krishna Muralidharan*¹; Pierre Deymier¹; Keith Runge¹; ¹University of Arizona

5:10 PM Invited

Potentials Energy Surfaces from Atomic-scale Hamiltonians: *Steven Valone*¹; Ghanshyam Pilania¹; Xiang-Yang Liu¹; Kedarnath Kolluri²; Michael Baskes³; ¹Los Alamos National Laboratory; ²University of Pennsylvania; ³University of California San Diego

Rare Metal Extraction & Processing Symposium — Indium, Moly, and Tungsten Metallurgy

Sponsored by: Associação Brasileira de Metalurgia, Materiais e Mineração – ABM, Chinese Society for Metals, Metallurgy and Materials Society of CIM, Institute of Materials, Minerals and Mining, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Neale Neelameggham, Ind LLC; Shafiq Alam, Memorial University of Newfoundland; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto, Kennecott Utah Copper Refinery

Monday PM Room: 16B
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Shijie Wang, Rio Tinto Kennecott Utah Copper Corp; Michael Free, University of Utah

2:00 PM Introductory Comments

2:05 PM

Recovery of Rare Metal Indium (In) from Discarded LCD Monitors: *Pankaj Choubey*¹; Manis Jha¹; Jinki Jeong²; Jae-chun Lee²; ¹CSIR-National Metallurgical Laboratory; ²Korea Institute of Geoscience and Mineral Resources (KIGAM)

2:25 PM

Thermodynamics of Indium Dissolution Behavior in FeO-bearing Metallurgical Slag: *Yunsoon Han*¹; Joohyun Park¹; ¹Hanyang University

2:45 PM

The Separation of Tungsten and Molybdenum by Ion Exchange Resins: Guangsheng Huo¹; Chao Peng¹; Chunhua Liao¹; ¹Central South University

3:05 PM

Removal of Na from the Ammonium Tungstate Solution by Na_{1+x}Al_xTi_{2-x}(PO₄)₃: *Xingyu Chen*¹; Xuheng Liu¹; Zhongwei Zhao¹; Jiangtao Liu¹; ¹Central South University

3:25 PM Break

3:45 PM

Removal of Sn from the Tungstate Solution by Nascent Hydrous Ferric Oxide: *Zhongwei Zhao*¹; Xingyu Chen¹; Xuheng Liu¹; Jiangtao Liu¹; ¹Central South University

4:05 PM

Pressure Water Leaching Molybdenum and Nickel from Mo-Ni Ore of Black Shale without Reagent: *Zhigan Deng*¹; ¹Kunming University of Science and Technology

Solid-state Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment — Interface Structures, Defects, and Shock Response

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Xiang-Yang Liu, Los Alamos National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Stephen Foiles, Sandia National Laboratories; Mitra Taheri, Drexel University; Rampi Ramprasad, University of Connecticut

Monday PM Room: 6D
February 17, 2014 Location: San Diego Convention Center

Session Chair: Xiang-Yang (Ben) Liu, Los Alamos National Laboratory

2:00 PM

Spiral Patterns in Dislocation Arrangements at Nodes in (111) Semi-coherent Interfaces in FCC Crystals: *Jian Wang*¹; Shuai Shao¹; Amit Misra¹; Richard Hoagland¹; ¹Los Alamos National Laboratory

2:20 PM Invited

Radiation Response of Immiscible Ag/Ni Multilayers: *Xinghang Zhang*¹; K.Y. Yu¹; Y. Chen¹; H. Wang¹; L. Shao¹; M.A. Kirk²; M. Li²; ¹Texas A&M University; ²Argonne National Laboratory

3:00 PM

Realistic Interfaces in Metallic Glass/Crystalline Composites: *Michael Gibbons*¹; Allen Hunter²; David Riegner¹; Emmanuelle Marquis²; Douglas Hofmann³; Katharine Flores⁴; Wolfgang Windl¹; ¹The Ohio State University; ²University of Michigan; ³Jet Propulsion Laboratory; ⁴Washington University

3:20 PM

Determining the Burgers Vectors and Elastic Strain Energies of Interface Dislocation Arrays Using Anisotropic Elasticity Theory: *Aurélien Vattré*¹; Michael Demkowicz²; ¹CEA; ²MIT

3:40 PM Break

3:50 PM Invited

Plastic Responses of Copper-lead Bicrystal Interfaces to Shock Loading: *Steven Valone*¹; Richard Hoagland¹; Ellen Ceretta¹; George Gray¹; Saryu Fensin¹; ¹Los Alamos National Laboratory

4:30 PM

Ab Initio Study on the Role of Interfaces for Structural Transformations in the Fe-C System: *Xie Zhang*¹; *Tilmann Hickel*¹; Jörg Neugebauer¹; Jutta Rogal²; Ralf Drautz²; ¹Max-Planck-Institut fuer Eisenforschung GmbH; ²Ruhr-Universität Bochum

4:50 PM Invited

Interfaces in Extreme Environments: Modeling across Multiple Scales: *Avinash Dongare*¹; ¹University of Connecticut

Ultrafine Grained Materials VIII — Special Session: Gradient and Layered Nanostructures

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

Program Organizers: Suveen Mathaudhu, Monash University; Zenji Horita, Kyushu University; Enrique Laverna, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Monday PM Room: 6E
February 17, 2014 Location: San Diego Convention Center

Session Chairs: Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research

2:00 PM Keynote

Gradient Nanostructures in Materials: *K. Lu*¹; Yi Li²; ¹Chinese Academy of Sciences; ²Department of Materials Science, National University of Singapore

2:20 PM Invited

Grain Size Gradient-induced Work Hardening and Extraordinary Ductilization: *Xiaolei Wu*¹; *Yuntian Zhu*²; ¹Institute of Mechanics, Chinese Academy of Sciences; ²North Carolina State University

2:40 PM

Gradient Structure: Perspective, Prospect and Problems: *Yuntian Zhu*¹; Xiaolei Wu²; Ke Lu³; ¹North Carolina State University; ²Chinese Academy of Sciences; ³Institute of Metal Research

3:00 PM Invited

Interfaces by Design: *Irene Beyerlein*¹; ¹Los Alamos National Laboratory

3:20 PM Invited

Layered Structures in Deformed Metals and Alloys: *Niels Hansen*¹; Xiaodan Zhang¹; Xiaoxu Huang¹; ¹Technical University of Denmark

3:40 PM Break

3:55 PM Invited

Ni Based Gradient Materials: Y Lin¹; Yi Li¹; K Lu¹; ¹Institute of Metal Research



4:15 PM Invited

Grain Size Effect on Twinning Propensity in Ultrafine-grained Ti Processed by Dynamic Plastic Deformation: Jingli Sun¹; Patrick Trimby²; Fengkai Yan³; Xiaozhou Liao²; Nairong Tao³; Jingtao Wang¹; ¹Nanjing University of Science and Technology; ²The University of Sydney; ³Institute of Metal Research, Chinese Academy of Sciences

4:35 PM Invited

Deformation and Fracture Mechanisms in Gradient Nano-grained Metals: Zhi Zeng¹; Ting Zhu¹; ¹Georgia Institute of Technology

4:55 PM Invited

Investigation of Deformation Behavior of Surface Nano-crystalline Materials: Andrey Molotnikov¹; Yuntian Zhu²; Xiaolei Wu³; Yuri Estrin¹; ¹Monash University; ²North Carolina State University; ³Chinese Academy of Sciences

5:15 PM Invited

Influence of Length Scale on Mechanical Behavior of a Multilayered Nanocrystalline Ni-Fe: Lilia Kurmanaeva¹; Hamed Bahmanpour¹; Haiyan Wang²; Jon McCrea³; Enrique Lavernia¹; Amiya Mukherjee¹; ¹University of California, Davis; ²Texas A & M University; ³Integran Technologies Inc.

2014 Functional Nanomaterials: Synthesis, Properties and Applications — Fabrication and Fundamentals II & Characterization and Properties I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Tuesday AM
February 18, 2014

Room: Ballroom D
Location: San Diego Marriott Marquis & Marina

Session Chairs: Jiyoung Kim, University of Texas at Dallas; Ramki Kalyanaraman, The University of Tennessee; Nitin Chopra, The University of Alabama

8:30 AM

Effect of Water/Tetraethylorthotitanate Ratio on the Morphology of Sol-Gel Derived TiO₂ Powder and Its Photocatalytic Activity: Lutfi Agartan¹; Derya Kapusuz¹; Jongee Park²; Abdullah Ozturk¹; ¹Middle East Technical University; ²Atilim University

8:50 AM

Electromigration in (111) Oriented Nano-twinned Copper: Tien-Lin Lu¹; Yi-Sa Huang¹; Chien-Min Liu¹; Chia-Ling Lu¹; Han-wen Lin¹; Chih Chen¹; ¹National Chiao Tung University

9:10 AM

Hybrid Nanowires Comprised of Oxide Core and Shells with Embedded Pt Nanoparticles: Caleb Felker¹; Wenwu Shi¹; Nitin Chopra¹; ¹The University of Alabama

9:30 AM

Nanostructured Cobalt Ferrites, Multifunctional Materials: Najeh Mliki¹; Lilia Ajroudi¹; Véronique Madigou²; Christine Leroux²; Lotfi Bessais³; ¹LMOP, Faculty of Science of Tunis, University of Tunis El Manar; ²IM2NP, UMR-CNRS 6242, Université du Sud Toulon-Var; ³CMTR, ICMPE, UMR7182, CNRS, Université Paris Est

9:50 AM Break**10:10 AM**

Novel Laser Thermal Dewetting of Ultrathin Metal Films under Water-glycerol Solutions: Sagar Yadavali¹; Ramki Kalyanaraman¹; ¹University of Tennessee

10:30 AM Invited

STM Study on Solid-state Reactions in Binary Molecular Assemblies: Yutaka Wakayama¹; ¹National Institute for Materials Science

11:05 AM

The Electrical Properties of Ag Nanoparticle Embedded ZnO Films by One-pot Solution Process: Po-Shun Huang¹; Eric Marksz¹; Jung-Kun Lee¹; ¹University of Pittsburgh

11:25 AM

Ultra-flat Transfer of CVD Graphene for Surface Force Measurements: Jude Britton¹; Nico Cousens¹; Susan Perkin¹; Nicole Grobert¹; ¹University of Oxford

11:45 AM

Atomic Resolution STEM Imaging of Tungsten Chalcogenide Nanowires: Jude Britton¹; Michelle Lim¹; Rebecca Nicholls¹; Arunvinay Prabakaran¹; Frank Dillon¹; Nicole Grobert¹; ¹University of Oxford

2014 Materials and Manufacturing Innovation — World Views on Materials and Manufacturing Innovation: Regional Perspectives from Government Organizations

Sponsored by: TMS: Materials Innovation Committee

Program Organizers: Charles Ward, Air Force Research Laboratory; Hani Henein, University of Alberta

Tuesday AM
February 18, 2014

Room: 6A
Location: San Diego Convention Center

Session Chair: Charles Ward, Air Force Research Laboratory; Hani Henein, University of Alberta

8:30 AM Introductory Comments**8:35 AM Presentations****Speakers include:**

Dr. Yoshio Akimune, General Manager, Technical Planning Division, Innovative Structural Materials Association, Japan
Dr. Cathy Foley, Chief of CSIRO Materials Science and Engineering Division, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia

Dr. Han Dong, Vice Chief Engineer of China Iron & Steel Research Institute Group (CISRI Group), Vice President of CISRI, Director of National Engineering Research Center of Advanced Steel Technology, China

Dr. Laurie Locascio, Director, Material Measurement Laboratory, The National Institute of Standards and Technology (NIST), USA

Dr. G. Sundararajan, Director, International Advanced Research Centre for Powder Metallurgy and New Materials, Hyderabad & Professor, Indian Institute of Technology Madras, India

10:05 AM Break**10:25 AM Presentations (Continued)****11:55 AM Concluding Comments****12:00 PM Panel Discussion**

2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications — Nanoceramics I—Nanostructured Ceramics-oxides and Thin Film Interfaces

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Nugehalli Ravindra, New Jersey Institute of Technology; Ramki Kalyanaraman, University of Tennessee; Haiyan Wang, Texas A&M University; Yuntian Zhu, North Carolina State University; Justin Schwartz, North Carolina State University; Amit Goyal, Oak Ridge National Laboratories

Tuesday AM
February 18, 2014

Room: Ballroom E
Location: San Diego Marriott Marquis & Marina

Session Chairs: Justin Schwartz, North Carolina State University; Haiyan Wang, Texas A&M University

8:30 AM Invited

Resistive Switching Characteristics of Mixed Oxides: *Ram Katiyar*¹; Rajesh Katiyar¹; Shojan Pavunny¹; Geetika Khurana¹; Pankaj Misra¹; ¹University of Puerto Rico

8:50 AM Invited

Growth of Multiferroic Thin-film Heterostructures: *John Prater*¹; Srinivasa Rao²; Sudhakar Nori²; Jagdish Narayan²; ¹U.S. Army Research Office; ²North Carolina State University

9:10 AM Invited

Oxides for Spintronics: *Ashutosh Tiwari*¹; ¹University of Utah

9:30 AM Invited

Oxide Based Thin Films, Properties and the Role of Defect Mediation: *Sudhakar Nori*¹; Jagdish Narayan¹; ¹North Carolina State University

9:50 AM

Tunable Magnetotransport and Device Application through Controlling Structural Boundaries in Self-assembled Vertically Aligned Nanocomposite Thin Films: Wenrui Zhang¹; Aiping Chen¹; Quanxi Jia²; Judith MacManus-Driscoll³; *Haiyan Wang*¹; ¹Texas A&M University; ²Los Alamos National Laboratory; ³University of Cambridge

10:10 AM Break

10:30 AM Invited

Misfit Accommodation in Oxide Heterostructures: *Matthew Chisholm*¹; Honghui Zhou²; Stephen Pennycook¹; Jagdish Narayan³; ¹Oak Ridge National Laboratory; ²University of Illinois at Urbana-Champaign; ³North Carolina State University

10:50 AM Invited

Synchrotron Scattering Studies of the Metal-insulator Phase Transition and Local Domain Formation in VO₂: *John Budai*¹; Jonathan Tischler²; Alexander Tselev¹; Andrei Kolmakov³; Olivier Delaire¹; Michael Manley¹; Eliot Specht¹; Ayman Said²; Lynn Boatner¹; Jagdish Narayan⁴; ¹Oak Ridge National Laboratory; ²Argonne National Laboratory; ³Southern Illinois University; ⁴North Carolina State University

11:10 AM Invited

Routes to Low Defect Interfaces between rocksalt Oxides and Wurtzite Nitrides: Elizabeth Paisley¹; Benjamin Gaddy¹; James LeBeau¹; Christopher Shelton¹; Ramón Collazo¹; Zlatko Sitar¹; *Douglas Irving*¹; Jon-Paul Maria¹; ¹North Carolina State University

11:30 AM

Simplex Network Modeling for Press-molded Ceramic Bodies Incorporated with Granite Waste: *Leonardo Pedroti*¹; ¹UENF

5th International Symposium on High Temperature Metallurgical Processing — Fundamental Research of 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; Mark Schlesinger, Missouri University of Science and Technology; Onuralp Yücel, ITU; Rafael Padilla, University of Concepcion; Phillip Mackey, P.J. Mackey Technology; Guifeng Zhou, Wuhan Iron and Steel

Tuesday AM
February 18, 2014

Room: 18
Location: San Diego Convention Center

Session Chairs: Jiann-Yang Hwang, Michigan Technological University; Ting'an Zhang, Northeastern University

8:30 AM Introductory Comments

8:35 AM

Effect of Water Vapor on the Activities of FeO and MgO in Slags Relevant to a Novel Flash Ironmaking Technology: Hong Yong Sohn¹; *M. Yousef Mohassab-Ahmed*¹; ¹University of Utah

8:55 AM

A Comparative Study on the Reduction of Mill Scale from Continuous Casting Processes: *Mehmet Bugdayci*¹; Ahmet Turan¹; Murat Alkan¹; Fahri Cihan Demirci¹; Onuralp Yucel¹; ¹Istanbul Technical University

9:10 AM

Activities of NbOx in Some CaO-A₁₂O₃-SiO₂-“Nb₂O₅” Melts at 1873K: *Baijun Yan*¹; Yixin Wang¹; Jun Fan¹; ¹University of Science and Technology Beijing

9:25 AM

Short Range Order and Fe Oxidation State in Composite Oxide Melts: Anthimos Xenidis¹; *Georgios Antipas*¹; Konstantinos Karalis¹; ¹National Technical University of Athens

9:40 AM

A Methodology for Controlling Grain Size in Friction Stir Processes: *Ali Ammouri*¹; Ramsey Hamade¹; ¹American University of Beirut

9:55 AM Break

10:05 AM

Kinetic Model on Modification of MgO-A₂O₃ Inclusions: *Shufeng Yang*¹; Weihua Zhang¹; Jingshe Li¹; Xiangzhou Gao¹; ¹University of Science and Technology Beijing

10:20 AM

Reaction Behavior of Sulfides Associated with Stibnite in Low Temperature Molten Salt Smelting Process without Reductant: Ye Long-gang¹; *Tang Chao-bo*¹; Chen Yong-ming¹; Tang Mo-tang¹; Zhang Wen-hai¹; ¹School of Metallurgy and Environment, Central South University

10:35 AM

Effect of Silicon on the Viscosity and Solidification Properties of Molten Irons with Titanium: *Mengfang Wei*¹; ¹University of Science and Technology Beijing

10:45 AM

The Interface Reaction and Transport of Oxygen between the Molten Melt and CaO-MgO-Al₂O₃ Slag: *Tao Zeng*¹; Jifang Xu²; Jianchao Li¹; Jieyu Zhang¹; Yanling Guo¹; ¹Shanghai University; ²Soochow University

10:55 AM

High-temperature Creep Deformation and Change in Porous Structure of Graphite Cathode in Aluminum Electrolysis Process: *Chen Tong*¹; Jilai Xue¹; Xiang Li¹; ¹University of Science and Technology Beijing

11:05 AM

The Dissolution Rate of Solid Alumina Inclusion into Molten CaF₂-CaO-MgO-Al₂O₃-SiO₂ Slags: *Shi Guan'yong*¹; Zhang Ting'an¹; Niu Li'ping¹; Dou Zhi'he¹; ¹Northeastern University



A Lifetime of Experience with Titanium Alloys: An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer — Loretto Honorary Session I: Phase Stability

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
 Program Organizers: Adam Pilchak, Air Force Research Laboratory; James Larsen, Air Force Research Laboratory; David Dye, Imperial College London; Jay Tiley, Air Force Research Laboratory

Tuesday AM Room: 1A
 February 18, 2014 Location: San Diego Convention Center

Session Chairs: David Dye, Imperial College London; Rajarshi Banerjee, University of North Texas

8:30 AM Invited

The Application of Advanced Characterization Techniques to Uncover Non-conventional Pathways for Phase Transformations in Ti Alloys: *Hamish Fraser*¹; *Yunzhi Wang*¹; *Rajarshi Banerjee*²; ¹The Ohio State University; ²University of North Texas

9:00 AM Invited

Omega Precipitation in Titanium Alloys: A Mixed Mode Diffusional-displacive Phase Transformation: *Rajarshi Banerjee*¹; *Srinivasan Srivilliputhur*¹; *Hamish Fraser*²; ¹University of North Texas; ²The Ohio State University

9:20 AM

Quantifying Omega Phase Evolution in Beta-titanium Alloys: *James Coakley*¹; *Vassili Vorontsov*¹; *Paul Bagot*²; *Nick Jones*³; *David Dye*¹; ¹Imperial College London; ²Oxford University; ³University of Cambridge

9:40 AM

The Influence of Oxygen on the Omega Formation in Ti-15Mo-O: *Herbert Boeckels*¹; *Robert Williams*²; *Colin McMillen*¹; *William Pennington*¹; *Hamish Fraser*²; *Henry Rack*¹; ¹Clemson University; ²The Ohio State University

10:00 AM Break

10:15 AM

Ti-Mo Alloys: Effects of Composition and Aging Heat Treatment on Microstructure and Mechanical Behavior: *Rubens Caram*¹; *Alessandra Cremasco*¹; *Eder Lopes*¹; ¹University of Campinas

10:35 AM

Role of Beta Phase Separation vs Non-classical Pseudospinodal Mechanism on Nucleation of Fine-scale Alpha in Beta Titanium Alloys: *Soumya Nag*¹; *Arun Devaraj*²; *Robert Williams*³; *Amit Behera*¹; *Pavani Kami*¹; *Yufeng Zheng*³; *Deep Choudhuri*¹; *Jaimie Tiley*⁴; *Hamish Fraser*³; *Rajarshi Banerjee*¹; ¹University of North Texas; ²Pacific Northwest National Laboratory; ³The Ohio State University; ⁴Air Force Research Laboratory

10:55 AM

Composition Non-uniformity Induced Refined Alpha Precipitates in Beta Ti-alloys: *Dong Wang*¹; *Rajarshi Banerjee*¹; *Yunzhi Wang*²; ¹University of North Texas; ²The Ohio State University

11:15 AM

Ab Initio Study of Vacancy Diffusion in Metastable Beta Ti-Mo Alloys: *Niraj Gupta*¹; *Rajarshi Banerjee*¹; *Srinivasan Srivilliputhur*¹; ¹University of North Texas

11:35 AM

The Influence of Heating Rate on Phase Transformations in Ti-3Al-8V-6Cr-4Mo-4Zr: *Herbert Boeckels*¹; *Henry Rack*¹; ¹Clemson University

11:55 AM

Nucleation Mechanism of Super-refined Alpha Microstructure in Beta Titanium Alloys: *Yufeng Zheng*¹; *R. E. A. Williams*¹; *P. Kami*²; *S. Nag*²; *Y. Gao*¹; *D. Wang*²; *R. Shi*¹; *Y. Wang*¹; *R. Banerjee*²; *H. L. Fraser*¹; ¹The Ohio State University; ²University of North Texas

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling — Simulation and Modeling

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

Program Organizers: Peter Hosemann, University of California Berkeley; Julie Tucker, Knolls Atomic Power Laboratory; James Cole, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Tuesday AM Room: 33B
 February 18, 2014 Location: San Diego Convention Center

Session Chair: Julie Tucker, Oregon State University

8:30 AM

Multiscale Modeling of Defect Cluster Evolution in Irradiated Structural Materials: *Brian Wirth*¹; *Donghua Xu*¹; *Aaron Kohnert*¹; ¹University of Tennessee

9:10 AM

A First-principles Model for the Effect of He Damage on Mechanical Properties of Tungsten Alloys: *Duc Nguyen-Manh*¹; *S.L. Dudarev*¹; *C.S. Becquart*²; *C. Domain*³; ¹Culham Centre for Fusion Energy; ²Universite de Lille; ³EDF-R&D

9:30 AM

Calculation of Displacement Doses for Ion Beam Simulation of Neutron Damage in Metals and Structural Alloys: *M. Bratchenko*¹; *V. Bryk*¹; *S. Dyuldyal*¹; *A. Kalchenko*¹; *N. Lazarev*¹; *V. Voyevodin*¹; *Frank Garner*²; *M. Toloczko*³; *L. Greenwood*³; ¹Kharkov Institute of Physics and Technology; ²Radiation Effects Consulting; ³Pacific Northwest National Laboratory

9:50 AM

Effects of Strain on Damage Generation in bcc Fe: *Benjamin Beeler*¹; *Mark Asta*²; *Peter Hosemann*²; *Niels Grønbech-Jensen*¹; ¹University of California, Davis; ²University of California, Berkeley

10:10 AM Break

10:30 AM

Combined First-principle and CALPHAD Modeling of Multi-phase Mn-Ni-Si-rich Precipitation in RPV Steels: *Huibin Ke*¹; *Wei Xiong*¹; *Leland Barnard*¹; *Ramanathan Krishnamurthy*¹; *Dane Morgan*¹; *Peter Wells*²; *Nicholas Cunningham*²; *George Odette*²; ¹University of Wisconsin-Madison; ²University of California-Santa Barbara

10:50 AM

Modeling the Effect of Irradiation on Plasticity and Creep in Zr and Zircoloy: *Alankar Alankar*¹; *Ricardo Lebensohn*¹; *Carlos Tome*¹; ¹Los Alamos National Laboratory

11:10 AM

Novel View of the Effect of Crystal Lattice on Novel View of the Effect of Crystal Lattice on Microstructure Evolution in Irradiated Metallic Materials: *Stanislav Golubov*¹; *Bachu Singh*²; *Alexander Barashev*¹; *Roger Stoller*¹; ¹ORNL; ²RISO National Laboratory, Technical University of Denmark

11:30 AM

Tuning Ideal Tensile Strengths and Intrinsic Ductility of BCC Refractory Alloys: *Liang Qi*¹; *Daryl Chrzan*¹; ¹University of California, Berkeley

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Strain and Plasticity

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Materials Characterization Committee, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Khalid Hattar, Sandia National Laboratories; Marko Knezevic, University of New Hampshire; Irene Beyerlein, Los Alamos National Laboratory

Tuesday AM
February 18, 2014
Room: 8
Location: San Diego Convention Center

Session Chairs: John Carpenter, Los Alamos National Laboratory; Khalid Hattar, Sandia National Laboratory

8:30 AM Invited

3D Probing of Dislocations and Strain Gradients near Buried Interfaces at Mesoscale: *Rozaliya Barabash*¹; ¹Oak Ridge National Laboratory

9:00 AM

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms in Superalloys at Elevated Temperatures: *Jennifer Carter*¹; Michael Mills²; Somnath Ghosh³; ¹Case Western Reserve University; ²The Ohio State University; ³Johns Hopkins University

9:20 AM

Plastic Deformation in Polycrystalline Cu: A Comparison between nf-HEDM Experiment and Full-field VPFET Model: *Reeju Pokharel*¹; Jonathan Lind¹; Shiu Fai Li²; Peter Kenesei³; Ricardo Lebensohn⁴; Anthony Rollett¹; Robert Suter¹; ¹CMU; ²Lawrence Livermore National Laboratory; ³Argonne National Laboratory; ⁴Los Alamos National Lab

9:40 AM Invited

High Resolution Reciprocal Space Mapping Revealing Reversible Changes in Deformation Structures during Unloading and Reloading in Tension: *Wolfgang Pantleon*¹; Felix Thiel²; Ulrich Lienert³; ¹Technical University of Denmark; ²TU Bergakademie Freiberg; ³DESY Photon Science

10:10 AM Break

10:30 AM Invited

Interaction between Dislocations and Lath Boundaries during High Temperature Deformation in 9Cr Heat-Resistant Steel: *Masatoshi Mitsuhashi*¹; Masaki Miake¹; Shigeto Yamasaki¹; Satoshi Hata¹; Hideharu Nakashima¹; Minoru Nishida¹; Junichi Kusumoto²; Akihiro Kanaya²; ¹Kyushu University; ²Kyushu Electric Power Co. Inc.

11:00 AM

Combining Discrete Dislocation Dynamics with Scanning Transmission Electron Microscopy Image Simulations: Caizhi Zhou¹; Richard LeSar²; Marc De Graef³; ¹Missouri University of Science and Technology; ²Iowa State University; ³Carnegie Mellon University

11:20 AM

Studying the Deformation of Metals Using EBSD and High Resolution DIC: *Joao Fonseca*¹; ¹The University of Manchester

11:40 AM

Atomic Imaging of Edge Dislocation and Twin in MnS Inclusion Embedded in a Stainless Steel: *Yang-Tao Zhou*¹; Zhang Bo¹; Ma Xiu-liang¹; ¹Institute of Metal Research

Advanced Composites for Aerospace, Marine, and Land Applications — Mechanical and Material Property Evaluation

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

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

Tuesday AM
February 18, 2014
Room: 6F
Location: San Diego Convention Center

Session Chairs: Yang Ren, Argonne National Laboratory; C.K.H. Dharan, University of California, Berkeley

8:30 AM Invited

A New Class of Metal Nanocomposites with Superior Mechanical Properties: Unusual Thermal Expansion in NbTi-Nanowires/TiNi-matrix Composite: Shijie Hao¹; Daqiang Jiang¹; Cun Yu¹; Lishan Cui¹; *Yang Ren*²; ¹China University of Petroleum; ²Argonne National Laboratory

9:10 AM

Thermo-mechanical Response and Damping Behavior of Shape Memory Alloy-MAX Phase Composites: *Ankush Kothalkar*¹; Rogelio Benitez¹; Liangfa Hu¹; Miladin Radovic¹; Ibrahim Karaman¹; ¹Texas A&M University

9:30 AM

Cyclic Loading Effects on Carbon Nanotube/Glass Fiber Composites: *C.K.H. Dharan*¹; ¹University of California, Berkeley

9:50 AM

Data-fusion NDE for Progressive Damage Quantification in Composites: *Jefferson Cuadra*¹; Prashanth Vanniamparambil¹; Kavan Hazeli¹; Ivan Bartoli¹; Antonios Kontsos¹; ¹Drexel University

10:10 AM Break

10:30 AM

Computational Prediction of Mechanical Properties of Glassy Polymer Blends and Thermosets: *David Rigby*¹; Paul Saxe¹; Clive Freeman¹; Benoit Leblanc¹; ¹Materials Design, Inc.

10:50 AM

Multiscale Characterization of SiC/SiC Composite Materials: *David Frazer*¹; Christina Back²; Christian Deck²; Peter Hosemann¹; Manuel Abad¹; ¹University of California, Berkeley; ²General Atomics

11:10 AM Invited

Processing Fracture Toughness and Damage Mechanics Studies on Metal Matrix Composites for Aerospace Applications: Ajit Bhandakkar¹; R C¹; Shankar ML Sastry²; ¹IIT, Bombay; ²WUSTL



Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion II — Wide Bandgap Semiconductors Materials Growth and Characterization

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee, TMS: Magnetic Materials Committee
 Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael McHenry, Carnegie Mellon University; Matthew Willard, Case Western Reserve University; Rachael Myers-Ward, NRL; Mike Lanagan, Penn State University; Clive Randall, Penn State University

Tuesday AM
 February 18, 2014

Room: Cardiff
 Location: San Diego Marriott Marquis & Marina

Session Chair: Travis Anderson, Naval Research Laboratory

8:30 AM Invited

Progress in 4H SiC Wafers and Epitaxy for Power Electronics Applications: *Darren Hansen*¹; Mark Loboda¹; Stephan Mueller¹; Jie Zhang¹; Bernd Thomas¹; Jeff Quast¹; Ian Manning¹; Clinton Whiteley¹; Gil Chung¹; ¹Dow Corning Compound Semiconductor

9:00 AM Invited

Silicon Carbide in Power Electronics: Overcoming the Obstacle of Bipolar Degradation: *Birgit Kallinger*¹; Christian Ehlers¹; Patrick Berwian¹; Jochen Friedrich¹; Mathias Rommel¹; ¹Fraunhofer IISB

9:30 AM

Growth of Thick, On-axis SiC Epitaxial Layers by High Temperature Halide CVD for High Voltage Power Devices: Mark Fanton¹; *David Snyder*¹; Marek Skowronski²; Randall Cavalero¹; Kathy Trumbull¹; Greg Pastir¹; Brian Weiland¹; ¹Penn State Applied Research Lab; ²Carnegie Mellon University

9:50 AM Break

10:10 AM

Interface Fermi Level Unpinning in Ni/4H-SiC Schottky Diodes Fabricated on Epilayers Grown by Tetrafluorosilane-based Chemical Vapor Deposition: *Sabih Omar*¹; Tawhid Rana¹; MVS Chandrashekar¹; Tangali Sudarshan¹; ¹University of South Carolina

10:30 AM Invited

Materials Issues for GaN-based HEMTs for Power Electronics: *James Speck*¹; ¹University of California, Santa Barbara

11:00 AM

Point Defect Control in Power III-Nitride Semiconductors: *Benjamin Gaddy*¹; Isaac Bryan¹; Zachary Bryan¹; Ronny Kirste¹; Marc Hoffmann¹; Baxter Moody²; Rafael Dalmau²; Ramon Collazo¹; Zlatko Sitar¹; Douglas Irving¹; ¹North Carolina State University; ²HexaTech, Inc

Advances in Surface Engineering: Alloyed and Composite Coatings III — High Temperature Coatings

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee

Program Organizers: Sandip Harimkar, Oklahoma State University; Jeff De Hosson, Univ of Groningen; Roger Narayan, University of North Carolina and North Carolina State University; Efstathios (Stathis) Meletis, University of Texas at Arlington; Virendra Singh, Schlumberger Rosharon Campus; Srinivasa Bakshi, Indian Institute of Technology-Madras; Mathieu Brochu, McGill University; Arvind Agarwal, Florida International University; Jian Luo, UC San Diego; Nancy Michael, University of Texas at Arlington; Nuggehalli Ravindra, New Jersey Institute of Technology; Adele Carrado, IPCMS; Choong-un Kim, University of Texas at Arlington; Amit Pandey, Rolls Royce LG Fuel Cell

Tuesday AM
 February 18, 2014

Room: 1B
 Location: San Diego Convention Center

Session Chair: Arvind Agarwal, Florida International University

8:30 AM Invited

High Temperature Coating Design using Interdiffusion Microstructure Maps: *John Morral*¹; Xiaojin Ke¹; Yunzhi Wang¹; ¹The Ohio State University

8:50 AM Invited

In Situ TEM Studies of Thermal Stability of FIB-prepared TEM Samples: *Suneel Kodambaka*¹; Isabelle Jouanny¹; Chilan Ngo¹; Justin Palisaitis²; Paul Mayrhofer³; Lars Hultman²; Per Persson²; ¹University of California, Los Angeles (UCLA); ²Linköping University; ³Vienna University of Technology

9:10 AM Invited

Thermal Sprayed Coatings for Heat Exchangers in Heat Storage Applications: *Patrick Masset*¹; Sebastian Schuster¹; ¹Fraunhofer UMSICHT

9:30 AM

Thermodynamic High-temperature Stability in Nano Metallic Multilayers: *Mikhail Polyakov*¹; Andrea Hodge¹; ¹University of Southern California

9:45 AM

High Temperature Oxidation of Nanostructured NiCoCrAlY: *Cory Kaplin*¹; Mathieu Brochu¹; ¹McGill University

10:00 AM Invited

High Temperature Corrosion Behaviour of Nanostructured Co-Al Coating: *Jayaganthan R*¹; Atikur Rahman²; ¹IIT Roorkee; ²NIT Srinagar

10:20 AM Break

10:30 AM

Microstructure and Optical Appearance of Friction Stir Processed and Anodized Al-TiO₂ Surface Composites: *Visweswara Gudla*¹; Flemming Jensen¹; Stela Canulescu¹; Aude Simar²; Rajashekhar Shabadi³; Jørgen Schou¹; Rajan Ambat¹; ¹Technical University of Denmark; ²Université catholique de Louvain; ³Universite Lille1

10:45 AM

Effects of Thermal Oxidation Process on Surface Hardness and Wear Properties of Ti-6Al-4V Alloy: *Sarala Upadhyaya*¹; Muralidhara B K¹; ¹University Visvesvaraya College Engineering

11:00 AM

Oxidation Studies of HVAS-sprayed Nanostructured Coatings at Elevated Temperature: *V N Shukla*¹; R Jayaganthan¹; V K Tewari¹; ¹Indian Institute of Technology, Roorkee

11:15 AM

STEM Investigations on Element Redistribution at Interfaces in a Thermal Barrier Coating after Isothermal Oxidation: *Y.L. Zhu*¹; Y.Z. Liu¹; H. Wei²; X.L. Ma¹; ¹Shenyang National Lab for Materials Science, Institute of Metal Research, Chinese Academy of Sciences.; ²Institute of Metal Research, Chinese Academy of Sciences,

11:30 AM

Original Coating & Surface Treatment Solutions for Temporarily Protecting a Water-sensitive Material: *Manuel Marya*¹; Virendra Singh¹;

Indranil Roy¹; Tatiana Reyes Hernandez¹; Timothy Dunne¹; Chunnong Wang¹;
¹Schlumberger Technology Corporation

Algorithm Development in Computational Materials Science and Engineering — Towards Higher Length Scales: Mesoscale Modeling and Scale Bridging: Part I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee
Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas; Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, Army Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology

Tuesday AM Room: 31B
February 18, 2014 Location: San Diego Convention Center

Session Chairs: Adrian Sabau, Oak Ridge National Laboratory; Ryan Sills, Stanford University

8:30 AM Invited

Characterizing Interface Dislocations by Atomically Informed Frank-Bilby Theory: *Jian Wang¹; Ruifeng Zhang¹; Caizhi Zhou¹; Irene Beyerlein¹; Amit Misra¹; ¹Los Alamos National Laboratory*

9:10 AM

Advanced Time Integration Algorithms for Dislocation Dynamics: *Ryan Sills¹; Wei Cai¹; ¹Stanford University*

9:30 AM

Temperature and Strain Rate Effects on the Dislocation Plasticity of BCC Transition Metals: *Hojun Lim¹; Christopher Weinberger¹; Corbett Battaile¹; Jay Carroll¹; Brad Boyce¹; ¹Sandia National Laboratories*

9:50 AM

Refining the FFT Method for Full-field Micro-mechanical Problems: *Ricardo Lebensohn¹; Benjamin Anglin²; Richard Lesar³; Anthony Rollett²; ¹Los Alamos National Laboratory; ²Carnegie Mellon University; ³Iowa State University*

10:10 AM Break

10:30 AM

Implementation of Cross Slip Mechanisms in Discrete Dislocation Dynamics Simulations: *Ahmed Hussein¹; Satish Rao²; Michael Uchic³; Jaafar El-Awady¹; ¹Johns Hopkins University; ²UES Inc.; ³Air Force Research Laboratory AFRL/RXCM*

10:50 AM

Numerical Integration of a Crystal Plasticity Model with Additional Slip Constraints Imposed by Material Interfaces: *Jason Mayeur¹; Irene Beyerlein¹; Curt Bronkhorst¹; Hashem Mourad¹; ¹Los Alamos National Laboratory*

11:10 AM

FFT-based Micromechanical Modeling of Polycrystalline Materials: New Algorithms for Complex Constitutive Behaviors: *Ricardo Lebensohn¹; ¹Los Alamos National Laboratory*

Alumina and Bauxite — Process Control

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Ian Duncan, Hatch Ltd

Tuesday AM Room: 15B
February 18, 2014 Location: San Diego Convention Center

Session Chair: Carlos Suarez, Ma'aden Aluminium Company

8:30 AM Introductory Comments

8:35 AM

Votorantim Metais – CBA Alumina Refinery Precipitation Modeling: *Thiago Franco¹; Roberto Seno¹; ¹CBA / Votorantim Metais*

9:00 AM

Value of Systems Integration to Optimize Operation in Alumina Refineries: *Hugues Tremblay¹; ¹Hatch*

9:25 AM

Study of Influences on the Bauxite Moisture and Solids in Filtrate in the Hyperbaric Filters through Design of Experiments (DOE) Statistic Tool: *Enio Silva¹; Américo Borges¹; Alex Pinheiro¹; ¹Hydro Alunorte*

9:50 AM

Increased Operational Flexibility in CFB Alumina Calcination: *Linus Perander¹; Ioannis Chatzilamprou¹; Cornelis Klett¹; ¹Outotec*

10:15 AM

Increasing Extraction Efficiency Using a Closed Grinding Circuit: *Júlia Meira¹; Roberto Seno¹; ¹CBA - Votorantim Metais*

Aluminum Alloys: Development, Characterization and Applications — Processing, Texture and Formability

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Xiyu Wen, University of Kentucky

Tuesday AM Room: 12
February 18, 2014 Location: San Diego Convention Center

Session Chair: Xiyu Wen, University of Kentucky

8:30 AM

An Experimental and Modeling Investigation on High-rate Formability of Aluminum: *Aashish Rohatgi¹; Richard Davies¹; Ayoub Souлами¹; Elizabeth Stephens¹; Mark Smith¹; ¹Pacific Northwest National Laboratory*

8:50 AM

Comparison of Microstructure, Texture and Formability between Direct Chill and Continuous Casting 5xxx Aluminum Alloy Sheets at O Temper: *Xiyu Wen¹; Jingwu Zhang²; Shridas Ningileri³; ¹University of Kentucky; ²Yanshan University; ³Secat Inc.*

9:10 AM

Influence of Chemical Composition and Process Parameters on Mechanical Properties and Formability of AlMgSi-sheets for Automotive Application: *Ramona Prillhofer¹; Josef Berneder¹; Gunther Rank¹; Helmut Antrekowitsch²; Peter Uggowitzer³; Stefan Pogatscher³; ¹AMAG Rolling GmbH; ²Montanuniversität Leoben; ³ETH-Zürich*

9:30 AM

Investigation of Superplastic Forming Properties in the Multipass Friction Stir Processed Al-Mg Alloy: *Vivek Pancholi¹; Pradeep Shivanna¹; ¹Indian Institute of Technology Roorkee*

9:50 AM

Friction Stir Back Extruded Aluminum Tubes: Mechanical Properties and Microstructural Evolution: *Fadi Abu-Farha¹; ¹Clemson University*

10:10 AM Break

10:25 AM

High Strength Aluminum Brazing Sheets for Condenser Fins of Automotive Heat Exchangers: *Kwangjun Euh¹; Hyoung-Wook Kim¹; Su-Hyeon Kim¹; ¹Korea Institute of Materials Science*

10:45 AM

Al-0.6 wt. % Sc Alloy Processed through Spray Forming and Powder Metallurgical Routes: *Harshal Agrawal¹; Raghukiran Nadimpalli²; Ravi Kumar²; ¹Visvesvaraya National Institute of Technology, Nagpur; ²Indian Institute of Technology, Madras*

11:05 AM

Flow Stress Behavior of Hypereutectic Al-Si Alloy: *Ying Zhang¹; ¹CHALCO*



11:25 AM

High-temperature Processes Occurring during Homogenization of AA6082 Aluminum Alloy: *Miroslav Cieslar*¹; Jan Bajer¹; Michal Hajek¹; Vladivoj Ocenasek²; ¹Charles University in Prague; ²SVUM a.s.

11:45 AM

Microstructural Effects on Deformation Behavior of Al-Cu-Li Alloys: *Ramasis Goswami*¹; ¹Naval Research Laboratory

Aluminum Processing — Aluminum Processing: Extrusion & Miscellaneous Processes

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Kai Karhausen, Hydro Aluminium Rolled Products GmbH

Tuesday AM
February 18, 2014

Room: 13
Location: San Diego Convention Center

Session Chair: To Be Announced

8:30 AM Introductory Comments

8:35 AM

AL-Ceramic Composites Liquid Metal Mixed, History: Hot Work Microstructures, Failures, Constitutive, Extrusion Modeling: *Hugh McQueen*¹; Enrico Evangelista²; ¹Concordia University; ²University of Ancona

8:55 AM

A Study of the Effects of Homogenization Scenarios and Extrusion Conditions on Recrystallization Mechanisms via Analysis of Texture and Microstructure Evolution in AA3003 Alloy: *Jingqi Chen*¹; Warren Poole¹; Lina Grajales¹; Nick Parson²; ¹The University of British Columbia; ²Rio Tinto Alcan

9:15 AM

A Numerical and Experimental Study of Homogenization of Al-Si-Mg Alloys: *Pikee Priya*¹; Matthew Krane¹; David Johnson¹; ¹Purdue University

9:35 AM

Development of Extremely Thin Wall Aluminum Fin Tube by Hot Extrusion: Sanjay Jha¹; *N Saibaba*¹; Kumar Vaibhaw¹; GVS Rao¹; ¹Nuclear Fuel Complex

9:55 AM

Effect of Mg₂Si Phase on Extrusion of AA6005 Aluminum Alloy: *Yiwei Sun*¹; David Johnson¹; Kevin Trumble¹; Pikee Priya¹; Matthew Krane¹; ¹Purdue University

10:15 AM Break

10:30 AM

Warm Forming of High-strength Al-Zn-Mg Alloys for Car Body Applications: Paolo Matteis¹; Graziano Ubertalli¹; Giorgio Scavino¹; *Donato Firrao*¹; ¹Politecnico di Torino

10:50 AM

Shaping the Mechanical Properties by Heat Treating the Cast Alloy AlSi30 Obtained by Rapid Solidification: *Dawid Kapinos*¹; Marcin Szymanek¹; ¹Institute of Non - Ferrous Metals

11:10 AM

Analysis of the Evolution and Deformation of Pore Morphology during Compression: *Li Wei*¹; Tingan Zhang²; Yuan Fang¹; Yunan Tian¹; ¹Shenyang Ligong University; ²Northeastern University

11:30 AM

Friction Stir Processing and Welding of Wrought and Cast Aluminum Alloys: Property Evaluations and Novel Applications: *Yi Pan*¹; Diana Lados¹; ¹Worcester Polytechnic Institution

Aluminum Reduction Technology — Cell Design and Performance - Cathodes and Anodes Joint Session with Electrode Technology

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Margaret Hyland, University of Auckland

Tuesday AM
February 18, 2014

Room: 14A
Location: San Diego Convention Center

Session Chair: Arne Petter Ratvik, SINTEF

8:30 AM Introductory Comments

8:35 AM

Influence of the Cathode Surface Geometry on the Metal Pad Current Density: *Marc Dupuis*¹; Valdis Bojarevics²; ¹GéniSim Inc; ²Greenwich University

9:00 AM

On the Influence of MHD Driven Convection on Cathode Wear: *Kristian Etienne Einarsrud*¹; Egil Skybakmoen¹; Asbjørn Solheim¹; ¹SINTEF

9:25 AM

Effect of Innovative Cathode on Bath/Metal Interface Fluctuation in Aluminum Electrolytic Cell: *Qiang Wang*¹; Baokuan Li¹; Naixiang Feng¹; ¹Northeastern University of China

9:50 AM

Simulation and Optimization of Cathode Current Distribution to Reduce the Horizontal Current in the Aluminum Liquid: Wangxing Li¹; Yanfang Zhang¹; *Dengpeng Chai*²; Jianhong Ynag²; Shilin Qiu²; Yueyong Wang²; ¹School of Metallurgy and Environment, Central South University; ²Zhengzhou Research Institute of Chalco

10:15 AM Break

10:30 AM

Numerical Simulation of Full Lifecycle Cathode Assembly Performances for Design Optimization: *Guorong Cao*¹; Xinquan Zhang²; Hao Zhang¹; ¹Pacific Aluminium; ²Rio Tinto Alcan

10:55 AM

Bar to Block Contact Resistance in Aluminum Reduction Cell Cathode Assemblies: *Richard Beeler*¹; ¹Alcoa Inc

11:20 AM

Anode Rod to Beam Contact.: *David Molenaar*¹; Tony Kilpatrick¹; ¹CSIRO

11:45 AM

Towards Decreasing Energy Consumption of Aluminum Reduction by Using Anodes with Holes and Channels: *Feng Naixiang*¹; PENG Jianping¹; Zhan Lei²; He Hua²; ¹Northeastern University; ²Ningxia Qingtongxia Energy Aluminum Group Co., Ltd

Biological Materials Science Symposium — Multi-scale Characterization and Modeling of Biological Materials (Joint session with Characterization of Minerals, Metals and Materials 2014 Symposium)

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Po-Yu Chen, National Tsing Hua University; Rajendra Kasinath, Johnson and Johnson Company; Dwayne Arola, University of Washington; Kalpana Katti, North Dakota State University

Tuesday AM
February 18, 2014

Room: 33A
Location: San Diego Convention Center

Session Chairs: Kalpana Katti, North Dakota State University; John Nychka, University of Alberta

8:30 AM Invited

Engineering Science and Mechanics as Key to the Mathematical Identification of “Universal” Patterns Pervading Mineralized Biological Tissues, and Beyond: *Christian Hellmich*¹; ¹Vienna University of Technology

9:00 AM

Deciphering Interfacial Chemomechanics in Biomaterial Interfaces Using Nanomechanical Spectroscopy Combined with Molecular Simulations: Tao Qu¹; Yang Zhang¹; Vikas Tomar¹; ¹Purdue University

9:20 AM

Fracture Toughness of Geologic and Biogenic Calcite Using Nanoindentation: *Shefford Baker*¹; Lauren Mangano¹; Miki Kunitake¹; Lara Estroff¹; ¹Cornell University

9:40 AM

Hybrid Nanoparticle Architecture for Cellular Uptake and Bioimaging: *Dilip Depan*¹; R.D.K. Misra¹; ¹University of Louisiana at Lafayette

10:00 AM Break

10:10 AM Keynote

Biomaterials by Design: Modeling, Synthesis, Testing: *Markus Buehler*¹; ¹Massachusetts Institute of Technology

10:50 AM

Compositional Characterization of Kidney Stones Using Thermal Methods: *Naina Raje*¹; Bhupesh Kalekar¹; Darshana Ghonge¹; Alok Srivastava²; AVR Reddy¹; ¹BARC; ²University

11:10 AM

Nano Scale Structure and Mechanical Properties of Hydrogels: *Hossein Salahshoor*¹; Nima Rahbar¹; ¹Worcester Polytechnic Institute

11:30 AM Invited

Biomechanical Approaches to Study Red Blood Cell-borne Diseases: Ming Dao¹; ¹Massachusetts Institute of Technology

Bulk Metallic Glasses XI — Structures and Mechanical Properties II

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

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Tuesday AM
February 18, 2014

Room: 2
Location: San Diego Convention Center

Session Chairs: Takeshi Egami, University of Tennessee; Katharine Flores, Washington University

8:30 AM Keynote

Atomistic Mechanism of Metallic Glass Formation: *Takeshi Egami*¹; ¹University of Tennessee

9:00 AM

Crystallization Mechanisms and Structural Relaxation in Cu-Zr Metallic Glasses: *Ilkay Kalay*¹; Eren Kalay²; Matthew Kramer³; Ralph Napolitano⁴; ¹Cankaya University; ²Middle East Technical University; ³Ames Laboratory US DOE; ⁴Iowa State University

9:10 AM Invited

Slip Avalanches in Amorphous Metals: Wendelin Wright¹; Rachel Byer¹; Xiajun Gu¹; *Todd Hufnagle*²; James Antonaglia³; Jonathan Uhl⁴; Karin Dahmen³; ¹Bucknell University; ²Johns Hopkins University; ³University of Illinois-Urbana Champaign; ⁴Retired

9:30 AM

Recovering Compressive Plasticity of BMGs by Thermo-creep: *Yang Tong*¹; W. Dmowski¹; Y. Yokoyama²; G. Y. Wang¹; P. K. Liaw¹; T. Egami¹; ¹The University of Tennessee-Knoxville; ²Institute for Materials Research, Tohoku University

9:40 AM Invited

Atomistic Mechanism of the Thermo-mechanical Creep in BMG: *Wojciech Dmowski*¹; Yang Tong¹; Takuya Iwashita¹; Takeshi Egami¹; ¹University of Tennessee

10:00 AM Break

10:20 AM Invited

Fracture Behavior of Metallic Glasses in Bending vs. Tension: Bernd Gludovatz¹; Jamie Kruzic²; Marios Demetriou³; William Johnson³; *Robert Ritchie*¹; ¹Lawrence Berkeley National Laboratory; ²Oregon State University; ³California Institute of Technology

10:40 AM Invited

Understanding the Mechanical Properties of Metallic Glass Matrix Composites: *Katharine Flores*¹; Kelly Kranjc¹; Michael Gibbons²; David Riegner²; Oscar Restrepo²; Douglas Hofmann³; Allen Hunter⁴; Emmanuelle Marquis⁴; Wolfgang Windl²; ¹Washington University; ²The Ohio State University; ³Jet Propulsion Laboratory; ⁴University of Michigan

11:00 AM

Investigating the Fracture Mechanics of Wear Resistant, High Glass Forming Bulk Metallic Glasses: *Laura Andersen*¹; Douglas Hofmann²; Kenneth Vecchio¹; ¹University of California, San Diego; ²NASA Jet Propulsion Laboratory/California Institute of Technology

11:10 AM Invited

Inhomogeneous Deformation of Bulk Metallic Glasses and Effective Temperature Modeling: *Jörg Löffler*¹; ¹ETH Zurich

11:30 AM Invited

In Situ High-energy X-ray Diffraction Studies of Deformation-induced Phase Transformation in Ti-based Amorphous Alloy Composites: *Yandong Wang*¹; Juan Mu¹; Haifeng Zhang²; ¹Northeastern University; ²Institute of Metal Research, Chinese Academy of Sciences

11:50 AM Invited

Microyielding of Core-shell Crystal Dendrites in a Metallic-glass Matrix Composite Investigated by Complementary In Situ Synchrotron Diffraction Measurements and Molecular-dynamics Simulation: *E-Wen Huang*¹; Junwei Qiao²; Wen-Jay Lee³; Peter Liaw⁴; Bartlomiej Winiarski⁵; Mario Scheel⁶; ¹National Central University; ²Taiyuan University of Technology; ³National Center for High-Performance Computing; ⁴University of Tennessee; ⁵University of Manchester; ⁶European Synchrotron Radiation Facility



Cast Shop for Aluminum Production — Recycling/ Cast Shop

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Edward Williams, Alcoa

Tuesday AM Room: 15A
February 18, 2014 Location: San Diego Convention Center

Session Chair: Anne Kvithyld, SINTEF

8:30 AM Introductory Comments

8:35 AM

Summary of the 2013 International Workshop on Aluminum Recycling:
*John Hryn*¹; Anne Kvithyld; ¹Argonne

8:55 AM

Life Cycle Assessment of Secondary Aluminium Refining: *Gro Gilstad*¹;
Johanne Hammervold²; ¹Student NTNU; ²MiSA AS

9:20 AM

A Material Flow Model for Impurity Accumulation in Beverage Can Recycling Systems: *Amund Lovik*¹; Daniel Müller¹; ¹Norwegian University of Science and Technology (NTNU)

9:45 AM

The Viability of a “Voluntary Refund/Deposit System” for U.S. Aluminum Can Recycling: *Jack Buffington*¹; ¹Royal Institute of Technology/MillerCoors

10:10 AM Break

10:25 AM

Operational Strategies for Two Stage Aluminum Remelter Operations: Increasing Scrap Use: *Elsa Olivetti*¹; Jiyoun Chang¹; Randolph Kirchain¹; ¹MIT

10:45 AM

Oxide Skin Strength Measurements on Molten Aluminum-manganese Alloys With and Without Salt on Surface: *Martin Syvertsen*¹; ¹SINTEF Materials and Chemistry

11:10 AM

Oxidation of Manganese-containing Aluminum Alloys: *Shawn Wilson*¹; Thorvald Abel Engh²; Gabriella Tranel²; Anne Kvithyld¹; ¹SINTEF Materials and Chemistry; ²NTNU

11:35 AM

Development of a Sampling Device for Melting Furnace Dress: *Anne Kvithyld*¹; Sarina Bao¹; Arne Nordmark¹; Mark Schlesinger²; Anders Johansson³; ¹SINTEF Materials and Chemistry; ²Missouri University of Science and Technology; ³Sapa Heat Transfer

Celebrating the Megascale: An EPD Symposium in Honor of David G.C. Robertson — Non-Ferrous Smelting, Converting, and Refining

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, WA School of Mines; Geoffrey Brooks, Swinburne University of Technology

Tuesday AM Room: 16A
February 18, 2014 Location: San Diego Convention Center

Session Chairs: Michael Moats, Missouri University of Science and Technology; Katie Schumacher, Stillwater Mining Corporation

8:30 AM Introductory Comments

8:35 AM Invited

Redoubling Platinum Group Metal Smelting Intensity - Operational Challenges and Solutions: *Rodney Hundermark*¹; Lloyd Nelson¹; Bertus de Villiers¹; July Ndlovu¹; Diale Mokwena¹; Phillimon Mukumbe¹; Bart Pieterse¹; Whitey Seyanund¹; Paul van Manen¹; ¹Anglo American Platinum

8:55 AM Invited

Pyrometallurgical Processing Technologies for Treating High Arsenic Copper Concentrates: *Patrick Taylor*¹; ¹Colorado School of Mines

9:15 AM

Arsenic and Antimony Capacities in Ni-Cu Mattes and Slags: *Ramana Reddy*¹; ¹The University of Alabama

9:35 AM

Quartz-cristobalite Transformation and Its Effect on Reactions in Si Production, Initial Studies: *Eli Ringdalen*¹; Leiv Kolbeinsen²; Merete Tangstad²; ¹Sintef Materials and Chemistry; ²NTNU

9:55 AM Break

10:15 AM Invited

Modifications to a Smelter to Accommodate Recycled Materials: *Katie Schumacher*¹; ¹Stillwater Mining Company

10:35 AM Invited

Removal of Pb from Molten Copper by FetO-SiO₂(-CaO,Al₂O₃) Slag Treatment in Mitsubishi Process: *Soo Sang Park*¹; Joohyun Park²; ¹LS-Nikko Copper; ²Hanyang University

10:55 AM

Simulation of the Gas Flow in a Peirce-Smith Converter: *Wagner Moulin Silva*¹; *Bruno Ribeiro Soares*¹; Felipe Terra Elias¹; ¹Magnesita Refratarios S.A.

11:15 AM Invited

From Phase Equilibrium and Thermodynamic Modelling to Freeze Linings – The Development of Techniques for the Analysis of Complex Slag Systems: *Ata Fallah Mehrjardi*¹; Peter Hayes¹; *Evgueni Jak*¹; ¹PYROSEARCH, The University of Queensland

11:35 AM

Modelling Simulation and Comparison of Refractory Corrosion at RHF's Technology Center: *Dean Gregurek*¹; Angelika Ressler¹; Anna Franzkowiak¹; Alfred Spanring¹; ¹RHI AG

Characterization of Minerals, Metals and Materials 2014 — Characterization of Environmental Materials

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Tuesday AM Room: 7A
February 18, 2014 Location: San Diego Convention Center

Session Chairs: Shadia Ikhmayies, Al Isra University; Jian Li, CanmetMATERIALS

8:30 AM

Subsurface De-alloying during SCW Exposure: *Jian Li*¹; Yimin Zeng¹; Wenyue Zheng¹; Pei Liu¹; Catherine Bibby¹; ¹CanmetMATERIALS

8:50 AM

Characterization of Clay Brick Incorporated with Ash from the Incineration of Urban Garbage: *Nicolle Coutinho*¹; Sergio Monteiro²; Carlos Mauricio Vieira¹; ¹Universidade Estadual do Norte Fluminense; ²Instituto Militar de Engenharia

9:10 AM

Concrete of Steel Slag Composite for Paved Road and Its Hydration Microstructure: *Honfei Fang*¹; *Jiann-Yang Hwang*¹; Gaifeng Xue¹; Lijun Lu¹; ¹R&D Center of WISCO

9:30 AM

Direct Precipitation of Sr-doped LaP₃O₉ Thin Film Electrolytes for Intermediate-temperature Fuel Cells in Condensed Phosphoric Acid Solutions: *Kota Takahashi*¹; Yoshinobu Adachi¹; Naoyuki Hatada¹; Tetsuya¹; ¹Kyoto University

9:50 AM

Method for Removal of Mercury from Oil Field Brine with Calcium Carbonate Co-precipitation: *Farhad Fazlollahi*¹; Larry L Baxter¹; Abdolmohammad Alamdari¹; Mohammad Mehdi Zarei¹; ¹Brigham Young University

10:10 AM Break

10:20 AM

Optical Parameters of Thermally Evaporated CdTe Thin Films: *Shadia Ikhmayies*¹; ¹Al Isra University

10:40 AM

Obtaining the Polystyrene-bentonite Nanocomposite as an Alternative to Polystyrene Discarded Recycling: *Messias Machado*¹; Hélio Wiebeck¹; Francisco Valenzuela-Díaz¹; Maria das Graças Valenzuela¹; Valquiria Justo¹; ¹Universidade de São Paulo-Escola Politécnica

11:00 AM

Modified Hydrotalcites as Desulfurization Adsorbents: Preparation, Characterization, and Performance Test: Andrew Gomes¹; *Mozammel Mozumder*¹; David Cocke¹; Hylton McWhinney²; Tracy Benson¹; ¹Lamar University; ²Prairie View A&M University

11:20 AM

Thermal Analysis and Characterization of Elephant Grass Ash (Pennisetum Purpureum) into Clay Matrix: *Roberto Faria*¹; Aline Silva¹; Rosane Toledo¹; Sergio Monteiro¹; Carlos Vieira¹; ¹State University of North Rio de Janeiro

11:40 AM

Characterization of High-arsenic Sludge in Copper Metallurgy Plant: *Xing Zhu*¹; ¹Kunming University of Science and Technology

Computational Modeling and Simulation of Advanced Materials for Energy Applications — MGI, ICME and Education (This is a joint session with Energy Technologies and Carbon Dioxide Management Symposium)

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM; Computational Materials Science and Engineering Committee
Program Organizers: Lan Li, Boise State University; Laura Bartolo, Kent State University; Cong Wang, Northwestern University; Chandler Becker, NIST

Tuesday AM
February 18, 2014

Room: Mission Hills
Location: San Diego Marriott Marquis & Marina

Session Chair: Laura Bartolo, Kent State University

8:30 AM Introductory Comments

8:35 AM Invited

Materials Genome Approach to Computational Design of Nanostructured Thermoelectrics: Jeff Doak¹; Shiqiang Hao¹; *Chris Wolverton*¹; ¹Northwestern University

9:05 AM Invited

Computational Phase-stability Research and Education in Energy Materials: Some Examples in Hydrogen Storage, Thermoelectrics and Nuclear Materials: *Raymundo Arroyave*¹; Anchalee Junkaew¹; Thien Duong¹; ¹Texas A & M University

9:35 AM Invited

Computational Materials Education and Training in the MGI Era: *Katsuyo Thornton*¹; Mark Asta²; ¹University of Michigan; ²University of California, Berkeley

10:05 AM Break

10:25 AM Invited

Reaching and Inspiring Student Engineers (RISE) through Simulations Based on Popular Video Games: *Walter Voit*¹; Ryan Marcotte¹; ¹UT Dallas

10:55 AM Invited

Energy Education for Engineers: Needs and Opportunities: *Jeffrey Fergus*¹; ¹Auburn University

11:25 AM Invited

Five Years of Innovation in Energy/Sustainability Education at Northwestern University: *David Dunand*¹; Mark Ratner¹; Bradley Sageman¹; ¹Northwestern University

Computational Thermodynamics and Kinetics — Thermodynamics and Kinetics

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

Tuesday AM
February 18, 2014

Room: 30D
Location: San Diego Convention Center

Session Chairs: Dane Morgan, University of Wisconsin-Madison; Zi-Kui Liu, The Pennsylvania State University

8:30 AM Invited

The MGI and Computational Thermodynamics and Kinetics: *James Warren*¹; ¹NIST

8:55 AM Invited

Thermodynamic Origin of Negative Thermal Expansion and Its Applications: *Zi-Kui Liu*¹; Yi Wang¹; Shunli Shang¹; ¹The Pennsylvania State University

9:20 AM Invited

Computational Thermodynamics and Kinetics in Materials Design: *Michele Manuel*¹; ¹University of Florida

9:45 AM Invited

Thermodynamics and Kinetics of High Temperature Materials: *Anton Van der Ven*¹; ¹University of California

10:10 AM Break

10:30 AM Invited

Modeling Thermokinetics of Perovskites and Related Oxides for Solid Oxide Fuel Cells: *Dane Morgan*¹; Yueh-Lin Lee¹; Milind Gadre¹; Tam Mayeshiba¹; Anh Ngo¹; Yang Shao-Horn²; Stuart Adler³; ¹University of Wisconsin - Madison; ²Massachusetts Institute of Technology; ³University of Washington

10:55 AM Invited

Kinetics of Radiation Defects in Metals Revisited by Ab Initio Calculations: *Mihai-Cosmin Marinica*¹; Christophe Domain²; Alexandre Legris³; Rebecca Alexander¹; Chu-Chun Fu¹; Francois Willaume¹; ¹CEA; ²EDF R&D; ³CNRS & Université Lille 1

11:20 AM

Thermodynamics and Phase Equilibrium in Nanoalloys: Particles Assemblies: *Mathieu Fevre*¹; Yann Le Bouar²; Alphonse Finel¹; ¹Onera; ²Cnrs

11:40 AM

Thermodynamic Investigations in Systems Relevant for Laves-phase Hardened Steels: *Clemens Schmetterer*¹; Aurelie Jacob¹; Torsten Markus¹; ¹Forschungszentrum Juelich GmbH



Data Analytics for Materials Science and Manufacturing — Emerging Big Data Opportunities in Materials Science

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS; Integrated Computational Materials Engineering Committee
Program Organizers: Jeff Simmons, Air Force Research Laboratory; Charles Bouman, Purdue University; Fariba Fahroo, Air Force Office of Scientific Research; Surya Kalidindi, Georgia Institute of Technology; Jeremy Knopp, Air Force Research Laboratory; Peter Voorhees, Northwestern University

Tuesday AM Room: 32B
 February 18, 2014 Location: San Diego Convention Center

Session Chairs: Krishna Rajan, Iowa State University; Carelyn Campbell, National Institute of Standards

8:30 AM Invited

Effective Extraction of Both Impurity Diffusion Coefficients and Interdiffusion Coefficients for Diffusivity Database Establishment: Qiaofu Zhang¹; Ji-Cheng Zhao¹; ¹The Ohio State University

8:55 AM Invited

Grain Boundary Data as a Big Data Problem: Gregory Rohrer¹; ¹Carnegie Mellon University

9:20 AM Invited

Linking 3D X-ray Imaging and Simulations: Erik Lauridsen¹; ¹Technical University of Denmark

9:45 AM

Fully Automated, High-throughput Powder X-ray Data Analysis: Bryce Meredig¹; Kyle Michel²; Greg Mulholland¹; Chris Wolverton²; ¹Citrine Informatics; ²Northwestern University

10:05 AM Break

10:30 AM Invited

Compressed Sensing for Fast Electron Microscopy: Hyrum Anderson¹; Jason Wheeler¹; Kurt Larson¹; ¹Sandia National Laboratories

10:55 AM Invited

Autonomous Research Systems for Materials Science: Daylond Hooper¹; Benji Maruyama²; ¹UES, Inc.; ²AFRL/RXAS

11:20 AM Invited

The Challenge of Combining Massive, High-dimensionality Data Streams from the Atomscope: Michael Miller¹; T. Kelly²; K. Rajan³; Simon Ringer⁴; ¹Oak Ridge National Laboratory; ²CAMECA Instruments; ³Iowa State University; ⁴The University of Sydney

Deformation, Damage, and Fracture of Light Metals and Alloys III — Mg Alloys

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

Program Organizers: Ke An, Oak Ridge National Laboratory; Qizhen Li, University of Nevada, Reno

Tuesday AM Room: 19
 February 18, 2014 Location: San Diego Convention Center

Session Chair: Qizhen Li, University of Nevada, Reno

8:30 AM Invited

Deformation Anisotropy of HCP Single Crystals under Nanoindentation: Yanfei Gao¹; Jonghan Kwon²; Michael Mills²; Dhiraj Catoor³; Lin Li¹; George Pharr¹; Easo George³; ¹University of Tennessee; ²Ohio State University; ³Oak Ridge National Laboratory

9:00 AM

In Situ Compression Study of Small-scale Mg Single Crystals: Jiwon Jeong¹; Ruth Tremel²; Daniel Kiener²; Sang Ho Oh¹; ¹POSTECH; ²Montanuniversität Leoben

9:20 AM

Dislocation Structure of <0001> Mg Single Crystal under Quasi-static and Dynamic Loading Compressions: Kelvin Xie¹; Neha Dixit¹; Simon Lockyer-Bratton¹; K.T. Ramesh¹; Kevin Hemker¹; ¹Johns Hopkins University

9:40 AM

Corrosion Fatigue Behavior of an Extruded AM30 Magnesium Alloy in Sodium Chloride Solution Environment: Weiwei Song¹; Holly Martin¹; Marcos Lugo¹; Christopher Walton¹; Mark Horstemeyer¹; Paul Wang¹; ¹Mississippi State University

10:00 AM Break

10:15 AM

Study of Plastic Deformation in a Wrought Magnesium Alloy by Real-time In Situ Neutron and Synchrotron X-ray Microbeam Diffraction: Wei Wu¹; Ke An²; Hua Qiao³; Peidong Wu³; Yanfei Gao¹; Wenjun Liu⁴; Peter Liaw¹; ¹The University of Tennessee; ²Oak Ridge National Laboratory; ³McMaster University; ⁴Argonne National Laboratory

10:35 AM

Deformation Behavior of AZ₃₁B Magnesium Alloy during Uniaxial Loading: In Situ Neutron Diffraction and EVPSC Modeling: Cheol Yoon¹; Wei Wu²; Huamiao Wang³; Peidong Wu³; Michael Gharghour⁴; Jinru Luo⁴; Anna Paradowska⁵; Ke An⁶; Peter Liaw²; Soo Yeol Lee¹; ¹Chungnam National University; ²The University of Tennessee; ³McMaster University; ⁴Canadian Neutron Beam Centre; ⁵Australian Nuclear Science and Technology Organisation; ⁶Oak Ridge National Laboratory

10:55 AM

Influence of Texture on Hall-Petch Relationship in a Mg Alloy: Yi Wang¹; Hahn Choo¹; ¹University of Tennessee

11:15 AM

Effects of Microstructure on Deformation Behaviour of AZ₉₀D Cast Alloy: Hoda Dini¹; Nils-Eric Andersson¹; Anders Jarfors¹; ¹Jönköping University, School of Engineering

11:35 AM

Stacking Faults and Deformation Mechanisms in Mg-Y Alloys: Dalong Zhang¹; Baolong Zheng¹; Yizhang Zhou¹; Enrique Lavernia¹; Suveen Mathaudhu¹; ¹University of California-Davis

Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — Simulations and Modeling of Phase Transformations and Reactions

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

Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Tuesday AM Room: 3
 February 18, 2014 Location: San Diego Convention Center

Session Chairs: Bruce Remington, Lawrence Livermore National Laboratory; Eugene Olevsky, San Diego State University

8:30 AM Keynote

Atomic Level Calculations of Spall and Phase Transformations: Michael Baskes¹; Niraj Gupta²; Srivilliputhur Srinivasan²; ¹UCSD; ²University of North Texas

9:00 AM Invited

Plastic Activity Due to Deformation of Nanovoids: Eduardo Bringa¹; Diego Tramontina¹; Carlos Ruestes¹; Joaquin Rodriguez-Nieva¹; Yizhe Tang²; Marc A. Meyers²; ¹CONICET- Universidad Nacional de Cuyo; ²University of California, San Diego

9:20 AM

Stress-induced Grain Growth in High Strain-rate Simulations of Al-Al Sliding Interfaces: Jacqueline Milhans¹; James Hammerberg¹; Ramon Ravelo¹; Timothy Germann¹; Brian Holian¹; ¹Los Alamos National Laboratory

9:40 AM

Micromechanics of Dynamic Solid-to-solid Phase Transformations: Francis Addressio¹; Turab Lookman¹; *Curt Bronkhorst*¹; Don Brown¹; Ellen Cerreta¹; Paulo Rigg¹; ¹Los Alamos National Laboratory

10:00 AM Break

10:20 AM Invited

Atomistic Simulation Studies of Shock-induced Spall in Cu Bicrystals: Effects of Grain Size and Strain Rate: *Timothy Germann*¹; Sheng-Nian Luo²; ¹Los Alamos National Laboratory; ²Sichuan University

10:40 AM

Mechanical Behavior of Polycrystalline and Ultrafine-grained Light Metal Alloys at High Strain Rates: *Vladimir Skripnyak*¹; Evganiya Skripnyak¹; Nataliya Skripnyak¹; ¹National Research Tomsk State University

11:00 AM

Computational Modeling of Mechanically Induced Reactions in Heterogeneous Reactive Materials: *Eric Herbold*¹; Ryan Austin¹; Efreem Vitali¹; ¹Lawrence Livermore National Laboratory

11:20 AM

Modeling and Simulation of the Failure Mechanism of Fiber Reinforced Structural Alumina during Low Velocity Impact Used in Protective Systems: *Costas Fountzoulas*¹; Raymond Brennan¹; ¹U.S. Army Research Laboratory

Electrode Technology for Aluminium Production — Paste Plant Operations

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Andre Proulx, Rio Tinto Alcan

Tuesday AM
February 18, 2014

Room: 14B
Location: San Diego Convention Center

Session Chair: Ronald Logan, Sunstone Development

8:30 AM Introductory Comments

8:35 AM

Characterization of Packing Ability of Coke Particles: *Kamran Azari*¹; Asem Hussein¹; Houshang Alamdari¹; Donald Ziegler²; Mario Fafard¹; ¹Laval University; ²Alcoa

9:00 AM

Texture Analysis of Anode Paste Images: *Julien Lauzon-Gauthier*¹; Carl Duchesne¹; Jayson Tessier²; ¹Laval University; ²Alcoa Global Primary Metals

9:25 AM

High Temperature Compression Test to Determine the Anode Paste Mechanical Properties: *Stéphane Thibodeau*¹; Hicham Chaouki¹; Houshang Alamdari¹; Donald Ziegler²; Mario Fafard¹; ¹Université Laval; ²Alcoa Primary Metals

9:50 AM

Viscoplastic Modeling of the Green Anode Forming Process: *Hicham Chaouki*¹; Stéphane Thibodeau¹; Houshang Alamdari¹; Donald Ziegler²; Mario Fafard¹; ¹Laval University; ²Alcoa Primary Metals

10:15 AM Break

10:25 AM

Characterization of Homogeneity of Green Anodes through X-ray Tomography and Image Analysis: *Kamran Azari*¹; Behzad Majidi¹; Houshang Alamdari¹; Donald Ziegler²; Mario Fafard¹; ¹Laval University; ²Alcoa

10:50 AM

Field Experience with the Buss Kneader Type KX: Highest Quality and throughput Targets Attained: *Hans-Ulrich Siegenthaler*¹; Christian Hauser¹; ¹Buss AG

11:15 AM

Maximizing Green Anode Slots Height through a Rigorous Methodology and Finite Elements Modeling: Yann El Ghaoui¹; *Philippe Contard*¹; Jean-Louis Abeille¹; Patrick Sornin¹; Alexandre Gagnon¹; Marc Gagnon¹; Franck Fruleux¹; François Moralès¹; ¹Rio Tinto Alcan

11:40 AM

High Performance of “Eolios” Pitch Fume Treatment System: Salima Sendid¹; Alix Courau²; ¹Solios Carbone; ²Solios Environnement

Energy Technologies and Carbon Dioxide Management — Carbon Dioxide Management

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Education Committee, TMS: Energy Committee

Program Organizers: Cong Wang, Northwestern University; Jan de Bakker, BBA, Inc; Cynthia Belt, Consultant; Animesh Jha, University of Leeds; Neale Neelameggham, Ind LLC; Soobhankar Pati, MOxST Inc.; Leon Prentice, CSIRO

Tuesday AM
February 18, 2014

Room: Balboa
Location: San Diego Marriott Marquis & Marina

Session Chairs: Leon Prentice, CSIRO; Soobhankar Pati, IIT, Bhubaneswar

8:30 AM Invited

Comparative Analysis of US Metal Flow and Recycling for Key Nonferrous Metals - Aluminum, Copper, Magnesium and Titanium - Using Energy and Emissions Sustainability Parameters: *Subodh Das*¹; Adam Gesing¹; Joseph Cresko²; Sujit Das³; ¹Phinix, LLC; ²US Department of Energy; ³National Transportation Research Center

9:00 AM

CO₂ Emission Reduction through Innovative Molten Salt Electrolysis Technologies Using Inert Anodes: *Dihua Wang*¹; ¹Wuhan University

9:20 AM

CO₂ Sequestration by Accelerated Carbonation of Alkaline Solid Waste and Scope for CCUS: Thenepalli Thriveni¹; *Ahn Whan*¹; ¹Korea Research Institute of Geoscience and Mineral Resources(KIGAM)

9:40 AM

Study on Utilization of Cyclic Heat Stewed Steel Slag Washing Water to Mineralize CO₂: Dou Zhi'he¹; Zhang Zi'mu¹; Liu Yan¹; Lv Guo'zi¹; *Zhang Ting'an*¹; Jiang Xiao'li¹; ¹Northeastern University

10:00 AM Break

10:20 AM Invited

Thermodynamic Phase Stability in Gasification Carbon Feedstock Slags Influenced by Extensive Vanadium Oxide Concentration: *Jimichiro Nakano*¹; Marc Duchesne²; James Bennett¹; Kyei-Sing Kwong¹; Xueyan Song³; ¹US DOE NETL; ²Natural Resources Canada CanmetENERGY; ³West Virginia University

10:40 AM Invited

Recent Advances in Carbon Dioxide Mineralization to Nano-size Calcium Carbonate Utilizing Waste Water: *Zhang Ting'an*¹; Zhao Hongliang¹; Liu Yan¹; Dou Zhihe¹; Lv Guozhi¹; Zhao Qiuyue¹; Li Yan¹; ¹Northeastern University

11:00 AM Invited

Development of Materials-by-design for CO₂ Capture Applications: Izaak Williamson¹; *Lan Li*¹; ¹Boise State University

11:20 AM

The GHG Emissions List Analysis of Aluminum Industry in China: Yuanyuan Wang¹; *Hao Bai*¹; Guangwei Du¹; Yuhao Ding¹; Kang Zhou¹; ¹University of Science and Technology Beijing

11:40 AM

Charge Effects on the Cu Pyramidal Nanoparticle and It's Application as a CO₂ Conversion Catalyst: Kihyun Shin¹; Da Hye Kim²; *Hyuck Mo Lee*¹; ¹KAIST; ²KITECH



Energy Technologies and Carbon Dioxide Management — MGI, ICME and Education (This is a joint session with the Computational Modeling and Simulation of Advanced Materials for Energy Applications symposium)

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Education Committee, TMS: Energy Committee

Program Organizers: Cong Wang, Northwestern University; Jan de Bakker, BBA, Inc; Cynthia Belt, Consultant; Animesh Jha, University of Leeds; Neale Neelameggham, Ind LLC; Soobhankar Pati, MOxST Inc.; Leon Prentice, CSIRO

Tuesday AM
February 18, 2014

Room: Mission Hills
Location: San Diego Marriott Marquis & Marina

Session Chair: Laura Bartolo, Kent State University

8:30 AM Joint Session with Computational Modeling and Simulation of Advanced Materials for Energy Applications A joint session with the Computational Modeling and Simulation of Advanced Materials for Energy Applications symposium is planned. This session will be held in the Mission Hills room of the Marriott. For complete session details, turn to the Computational Modeling symposium entry in the program book or online.

8:30 AM Introductory Comments

8:35 AM Invited: Materials Genome Approach to Computational Design of Nanostructured Thermoelectrics; presented by Chris Wolverton, Northwestern University

9:05 AM Invited: Computational Phase-stability Research and Education in Energy Materials: Some Examples in Hydrogen Storage, Thermoelectrics and Nuclear Materials; presented by Raymundo Arroyave, Texas A & M University

9:35 AM Invited: Computational Materials Education and Training in the MGI Era; presented by Katsuyo Thornton, University of Michigan

10:05 AM Break

10:25 AM Invited: Reaching and Inspiring Student Engineers (RISE) through Simulations Based on Popular Video Games; presented by Walter Voit, UT Dallas

10:55 AM Invited: Energy Education for Engineers: Needs and Opportunities; presented by Jeffrey Fergus, Auburn University

11:25 AM Invited: Five Years of Innovation in Energy/Sustainability Education at Northwestern University; presented by David Dunand, Northwestern University

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Microstructure-properties-fatigue Relationships

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

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

Tuesday AM
February 18, 2014

Room: 7B
Location: San Diego Convention Center

Session Chairs: Antonios Kotsos, Drexel University; Jacob Hochhalter, NASA LaRC

8:30 AM Introductory Comments

8:35 AM Keynote

Hot Spots in Fatigued Ti-6Al-4V: *Angus Wilkinson*¹; Philip Littlewood¹; T Britton²; Jun Jiang¹; ¹University of Oxford; ²Imperial College London

9:15 AM Invited

New Insight to the Evolved Microstructure under Fatigue Loading: David Gross¹; Kelly Nygren¹; May Martin¹; Moshen Dadfarnia¹; Petros Sofronis¹; *Ian Robertson*²; ¹University of Illinois; ²University of Wisconsin-Madison

9:35 AM Invited

In Situ Microscale Fatigue Testing of an $\alpha + \beta$ Titanium Alloy, Ti-6246: *Christopher Szczeplanski*¹; Sushant Jha²; Paul Shade¹; Robert Wheeler³; James Larsen¹; ¹US Air Force Research Laboratory; ²UTC/AFRL; ³UES/Microtesting Solutions

9:55 AM

Evolution of Microstructure and Mechanical Properties During Rolling Contact Fatigue of Graded High Strength Bearing Steels: *Ghatu Subhash*¹; Nagaraj Arakere¹; ¹University of Florida

10:15 AM Break

10:35 AM

Nano-indentation Based Study of Slip Transmission across Grain Boundaries and the Effect of Aging and Grain Orientation on the Indentation Response in Al-Cu Alloys: *Vipul Gupta*¹; Jacob Hochhalter²; Stephen Smith²; ¹National Institute of Aerospace; ²NASA Langley Research Center

10:55 AM

Performance Characterization of Aluminum Sensory Alloys: *John Newman*¹; William Leser¹; Jacob Hochhalter¹; Vipul Gupta¹; Daren Hart²; Stephen Cornell²; ¹NASA Langley Research Center; ²Texas A&M University

11:15 AM Invited

Mechanism of Crack Initiation and Modeling of Fatigue Life for Very-high-cycle Fatigue of High Strength Steels: *Youshi Hong*¹; Chengqi Sun¹; Zhengqiang Lei¹; ¹Institute of Mechanics, Chinese Academy of Sciences

11:35 AM

Characterization of Deformation Mechanisms under Cyclic and Dwell Fatigue in a Polycrystalline Ni-based Superalloy: *Tim Smith*¹; Patrick Phillips²; Yunzhi Wang¹; David Mourer²; Andrew Wessman³; Dan Wei³; Michael Mills¹; ¹The Ohio State University; ²University of Illinois-Chicago; ³GE Aviation

11:55 AM Concluding Comments

Gamma TiAl Alloys 2014 — Session III

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Titanium Committee

Program Organizers: Young-Won Kim, Gamteck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimiduk, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

Tuesday AM
February 18, 2014

Room: 6B
Location: San Diego Convention Center

Session Chairs: Yuyong Chen, Harbin Institute of Technology; Patrick Masset, AZT

8:30 AM Invited

Physical Metallurgy and Performance of the TNB and Gamma-Md-alloy Systems: *Fritz Appel*¹; Michael Oehring¹; Jonathan Paul¹; ¹Helmholtz Zentrum Geesthacht

8:55 AM

Manufacturing and Properties of High Nb-TiAl Sheet Materials: *Yongfeng Liang*¹; Zhengzhang Shen¹; Heng Wang¹; Laiqi Zhang¹; Guojian Hao¹; Junpin Lin¹; ¹University of Science and Technology Beijing

9:15 AM

Influence of Extrusion Texture on the Microstructure and Mechanical Properties of Fully Lamellar Ti-47Al-2Cr-2Nb-0.15B: *Renci Liu*¹; Dong Liu¹; Yuyou Cui¹; Jun Tan¹; Rui Yang¹; ¹Institute of Metal Research, Chinese Academy of Sciences

9:35 AM

Fatigue Thresholds of a Lamellar Gamma-TiAl Alloy: *Hangyue Li*¹; Shiyuan Wang¹; Jing Yang¹; Dawei Hu¹; Nigel Martin²; Mark Dixon²; Paul Bowen¹; ¹The University of Birmingham; ²Rolls-Royce plc.

9:55 AM

Microstructure Stability and Mechanical Properties in Gamma Plus Sigma Titanium Aluminides: *Glenn Bean*¹; Cameron Palmer¹; Hans Seifert²; Fereshteh Ebrahimi¹; Michele Manuel¹; ¹University of Florida; ²Karlsruhe Institute for Technology

10:15 AM Break

10:35 AM Invited

Recent Advances in Wrought Processing: *Yuyong Chen*¹; ¹Harbin Institute of Technology

10:55 AM

On the Problem of Low-temperature Ductility Improvement of Ti-Al and Ti-Al-Nb Based Alloys: *Nadezhda Nochovnaya*¹; *Pavel Panin*¹; Evgeny Alexeev¹; Dmitry Kablov¹; ¹FSUE "VIAM"

11:15 AM Invited

Experimental Research on the Recycling Potential of Precision Cast Gamma-TiAl during Electroslag Remelting: Bernd Friedrich¹; Peter Spiess¹; Todor Stoyanov²; Julio Aguilar²; *Marek Bartosinski*¹; ¹RWTH Aachen University; ²ACCESS e.V.

11:40 AM

Solid-state Reactions in Heating of Multilayer Ti / Al Foils: *Zhengzhang Shen*¹; Yongfeng Liang¹; Laiqi Zhang¹; Guojian Hao¹; Jianping He¹; Junpin Lin¹; ¹University of Science and Technology Beijing

High-temperature Gamma (f.c.c.) /Gamma-Prime (L12 structure) Co-Al-W Based Superalloys — Processing, Deformation and Interfaces

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee

Program Organizers: David Seidman, Northwestern University; David Dunand, Northwestern University; Chantal Sudbrack, NASA Glenn Research Center; Carelyn Campbell, National Institute of Standards and Technology; Ursula Kattner, National Institute of Standards and Technology; David Dye, Imperial College

Tuesday AM
February 18, 2014

Room: 5A
Location: San Diego Convention Center

Session Chairs: David Seidman, Northwestern University; Akane Suzuki, GE Global Research

8:30 AM Plenary

High Temperature Properties of Single Crystal Cobalt -base Alloys: *Tresa Pollock*¹; Michael Titus; Alessandro Mottura; ¹University of California Santa Barbara

9:10 AM Invited

Creep Properties and Segregation Behavior of γ' -Strengthened Co-base Superalloys: *Mathias Göken*¹; Steffen Neumeier¹; ¹University Erlangen-Nürnberg

9:40 AM

On the Role of Alloying Composition and Processing Parameters in Co-Base γ - γ' Composites: Bonta Srinivasarao¹; Marta Carton-Cordero²; Monica Campos²; *Jose Torralba*¹; ¹IMDEA Materials Institute; ²Universidad Carlos III Madrid

10:00 AM Break

10:20 AM Invited

Co-Al-W Superalloys, Interface Width and Dislocations: *David Dye*¹; Vassili Vorontsov¹; Paul Bagot²; Rajarshi Banerjee²; Matthias Knop¹; Hui Yu Yan¹; ¹Imperial College; ²Oxford University; ³University of North Texas

10:50 AM

Alloying Effects on the Matrix-precipitate Interface Width in Co-Al-W Base Superalloys: *Vassili Vorontsov*¹; Hui-Yu Yan¹; Jonathan Barnard²; Paul

Midgley²; David Dye¹; ¹Imperial College London; ²University of Cambridge

11:10 AM

Atomic Scale Observation of the Structure and Composition of Order/Disorder Gamma Prime/Gamma Interfaces in Cobalt-base Superalloys: *Subhashish Meher*¹; R.E.A. Williams²; Soumya Nag¹; Hamish Fraser²; Rajarshi Banerjee¹; ¹University of North Texas; ²The Ohio State University

11:30 AM

Creep Deformation Mechanisms in L1₂-Containing Co-Al-W-base Superalloys: *Michael Titus*¹; Yolita Eggeler²; Akane Suzuki³; Tresa Pollock¹; ¹University of California, Santa Barbara; ²University of Erlangen-Nuernberg; ³GE Global Research Center

High-temperature Material Systems for Energy Conversion and Storage — Solid Oxide Fuel Cells II

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Kyle Brinkman, Savannah River National Laboratory (SRNL); Xingbo Liu, West Virginia University; Kevin Huang, University of South Carolina

Tuesday AM

February 18, 2014

Room: Carlsbad

Location: San Diego Marriott Marquis & Marina

Session Chairs: Xingbo Liu, West Virginia University; Jinhua Tong, Colorado School of Mines

8:30 AM Invited

Surface Reaction Processes for Doped Ceria Using Electrical Conductivity Relaxation Technique: Yunlong Wang¹; *Changrong Xia*¹; ¹University of Science and Technology of China

9:00 AM

Improving Long-term Stability of Intermediate Temperature Solid Oxide Fuel Cell Cathodes with Atomic Layer Deposition: *Kevin Huang*¹; ¹University of South Carolina

9:20 AM

Surface Segregation and Phase Formation in Thin Films of SOFC Cathode Materials: Jacob Davis¹; Yang Yu¹; Deniz Cetin¹; Karl Ludwig¹; Uday Pal¹; Srikanth Gopalan¹; *Soumendra Basu*¹; ¹Boston University

9:40 AM

Mitigation of Chromium Poisoning in Solid Oxide Fuel Cell System by Choosing New BoP Material and Modifying Electrode-electrolyte Interface: *Na Li*¹; Le Ge¹; Prabhakar Singh¹; ¹Uconn

10:00 AM Break

10:20 AM

An Interrupted In Situ Method for Electrochemical Formation of Mg-Ni Intermetallics: *Fuat Erden*¹; Ishak Karakaya¹; Metehan Erdogan²; ¹Middle East Technical University; ²Yildirim Beyazit Üniversitesi

10:40 AM

Elastic Properties of Thin Ceramic Multilayers in a Solid Oxide Fuel Cell: *Amit Pandey*¹; Amit Shyam¹; Zhien Liu²; Richard Goettler²; ¹ORNL; ²LG Fuel Cell Systems Inc.



Hume-Rothery Award Symposium: Thermodynamics and Kinetics of Engineering Materials — Light Alloy Systems

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Alloy Phases Committee

Program Organizers: Hans Juergen Seifert, Karlsruhe Institute of Technology (KIT); Alan Luo, The Ohio State University; Peter Uggowitzer, ETH Zürich; Fan Zhang, CompuTherm, LLC

Tuesday AM
February 18, 2014

Room: 6C
Location: San Diego Convention Center

Session Chairs: Ursula Kattner, NIST; Tetsuo Mohri, Hokkaido University

8:30 AM Invited

Modeling Precipitation and Hardening in Mg Alloys: Yipeng Gao¹; Hong Liu²; Jian-Feng Nie²; Yunzhi Wang¹; ¹Ohio State University; ²Monash University

8:50 AM Invited

Precipitation Simulation of Mg-Al Based Magnesium Alloys: Fan Zhang¹; Chuan Zhang¹; Weisheng Cao¹; Shuanglin Chen¹; Jun Zhu¹; ¹CompuTherm, LLC

9:10 AM Invited

Calphad Data and File Repositories for the Development of Design Tools for Magnesium Alloys: Ursula Kattner¹; Carelyn Campbell¹; Alden Dima¹; Laura Bartolo²; ¹National Institute of Standards and Technology; ²Kent State University

9:30 AM

Experimental Investigation and Thermodynamic Modeling of the Mg-rich Corner of Mg-Zn-Sm Ternary System: Xiangyu Xia¹; Amirreza Zadeh¹; Chuan Zhang¹; Xiaoqin Zeng¹; Alan Luo¹; Donald Stone¹; ¹University of Wisconsin Madison

9:50 AM

SIMS-based Experimental Studies of Tracer Diffusion: Nagraj Kulkarni¹; Robert Warmack²; Jerry Hunter³; Yongho Sohn⁴; Kevin Coffey⁴; Graeme Murch⁵; Irina Belova⁵; ¹Knoxville, TN; ²Oak Ridge National Laboratory; ³Virginia Polytechnic Institute and State University; ⁴University of Central Florida; ⁵The University of Newcastle

10:10 AM Break

10:30 AM Invited

The Kinetics of β'' Precipitation in Al-Mg-Si Alloys: Junsheng Wang¹; Mei Li¹; Zhenzhen Yu²; Jiashi Miao³; Zhili Feng²; John Allison³; ¹Ford Motor Company; ²Oak Ridge National Laboratory; ³University of Michigan

10:50 AM Invited

Phase Stability in Titanium Based Ternary Systems: Jean Claude Tedenac¹; Alexandre Berche¹; Philippe Jund¹; Catherine Colinet¹; Iuliia Fartushna Fartushna¹; Marina Bulanova¹; ¹ICG

11:10 AM

Systematic Analysis and Thermodynamic Optimizations of the Binary Mn-RE Systems: Junghwan Kim¹; In-Ho Jung¹; ¹McGill University

ICME: Linking Microstructure to Structural Design Requirements — ICME: Linking Microstructure to Structural Design Requirements III

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS; Integrated Computational Materials Engineering Committee

Program Organizers: Rajiv Mishra, University of North Texas; David Furrer, Pratt & Whitney; Peter Collins, University of North Texas; Charles Ward, Air Force Research Laboratory; Craig McClung, Southwest Research Institute

Tuesday AM
February 18, 2014

Room: 31A
Location: San Diego Convention Center

Session Chair: Craig McClung, Southwest Research Institute

8:30 AM Invited

Integrated Computational Materials Engineering for Metallic Materials in the Airframe Industry: Ryan Glamm¹; James Cotton¹; ¹Boeing Research and Technology

9:10 AM

Multiscale Corrosion Modeling of Aerospace Coatings Systems: Erik Sapper¹; ¹The Boeing Company

9:30 AM

Yield Asymmetry Design and Crashworthiness Improvement of Magnesium Alloys by Integrated Computational Materials Engineering: Dongsheng Li¹; Vineet Joshi¹; Curt Lavender¹; Moe Khaleel²; Said Ahzi³; ¹Pacific Northwest National Laboratory; ²Qatar Foundation Research and Development; ³University of Strasbourg

9:50 AM

Microstructure Modeling to Ductility Prediction of Mg Alloys: Erin Barker¹; Xin Sun¹; Kyoo Sil Choi¹; ¹Pacific Northwest National Lab

10:10 AM Break

10:30 AM Invited

Integrated Modelling Applied to Process Design: FSW of Aluminium Alloys: Anne Denquin¹; Aude Simar²; Christophe Gallais¹; Bruno de Meester²; Thomas Pardoën²; Yves Bréchet³; ¹Onera; ²Université catholique de Louvain; ³SIMaP/INP Grenoble

11:10 AM

Development and Implementation of ICME in Designing Welded Structures: Yu-Ping Yang¹; Jerry Gould¹; Bill Mohr¹; Ed Herderick¹; ¹EWI

11:30 AM

Characterization of Mechanical Property Variation across an Inertia Friction Weld of a CrMoV Steel: Christopher Bennett¹; Omar Iracheta Cabrera¹; Wei Sun¹; ¹The University of Nottingham

Length Scaling of Lamellar and Patterned Microstructures During Solid-Solid Phase Transformations and Solidification — Dendrites

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM; Phase Transformations Committee, TMS; Solidification Committee

Program Organizers: Robert Hackenberg, Los Alamos National Lab; Carlos Capdevila-Montes, CENIM-CSIC; Amy Clarke, Los Alamos National Laboratory; John Perepezko, University of Wisconsin-Madison

Tuesday AM
February 18, 2014

Room: 32A
Location: San Diego Convention Center

Session Chairs: John Perepezko, University of Wisconsin-Madison; Christoph Beckermann, University of Iowa

8:30 AM Invited

Capillary Bias Fields and Interface Branching: Martin Glicksman¹; ¹Florida Institute of Technology

9:00 AM Invited

Scaling Behavior of Alloy Dendrites: *Christoph Beckermann*¹; ¹University of Iowa

9:30 AM Invited

Multiscale Modeling of Dendritic Microstructures: Bridging the Tip and Grain Scales: *Alain Karma*¹; Damien Tournet¹; Younggil Song¹; ¹Northeastern University

10:00 AM Break

10:20 AM

Oscillatory Dynamics of Cellular Patterns in 3D Directional Solidification: *Damien Tournet*¹; Alain Karma¹; Nathalie Bergeon²; Bernard Billia²; Jean-Marc Debierre²; Rahma Guérin²; Liang Chen²; Anthony Ramirez²; Rohit Trivedi³; ¹Northeastern University; ²Aix-Marseille University and CNRS; ³Iowa State University

10:45 AM Invited

The Morphological Stability of Lamellar Microstructures: Larry Aagesen¹; Anthony Johnson²; Julie Fife³; Michael Miksis²; Erik Lauridsen⁴; *Peter Voorhees*²; ¹University of Michigan; ²Northwestern University; ³Paul Scherrer Institut; ⁴Technical University of Denmark

11:15 AM

In Situ Examinations of Dynamic Solid-liquid Interface Instability in Metallic Alloys: *Amy Clarke*¹; Paul Gibbs¹; Seth Imhoff¹; Jason Cooley¹; Wah-Keat Lee²; Kamel Fezzaa³; Alain Karma⁴; Damien Tournet⁴; Alex Deriy³; Martha Katz¹; Kester Clarke¹; Robert Field¹; James Smith¹; Dan Thoma¹; David Teter¹; ¹Los Alamos National Laboratory; ²Brookhaven National Laboratory; ³Argonne National Laboratory; ⁴Northeastern University

11:40 AM

Solutal Melting: In Situ Observations Using Laser Scanning Confocal Microscopy and Determination of Interface Compositions: *Léa Deillon*¹; Julien Zollinger¹; Dominique Daloz¹; Miha Založnik¹; Hervé Combeau¹; ¹Université de Lorraine

Light-metal Matrix (Nano)-composites — Microstructure-Property Relationships II: Modeling and Advanced Characterization

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee, TMS: Magnesium Committee

Program Organizers: Wim Sillekens, European Space Agency; Dmitry Eskin, Brunel University

Tuesday AM
February 18, 2014

Room: 17B
Location: San Diego Convention Center

Session Chair: Xiaochun Li, University of California

8:30 AM

Phase Formation and Mechanical Properties of Al-Mg-Mn-Ti-B-Zr-Sc Composite Material: *Elena Kurbatkina*¹; Nikolay Belov¹; Alexander Alabin¹; ¹National University of Science and Technology "MISIS"

8:50 AM

Fabrication and Tensile Properties of A₁₂O₃ Particle and Fibre Hybrid Magnesium (AM60)-based Composites: *Xuezhi Zhang*¹; Xueyuan Nie¹; Henry Hu¹; ¹University of Windsor

9:10 AM

Physico-mechanical and Electrical Properties of Aluminum-based Composite Materials with Carbon Nanoparticles: Sergey Vorozhtsov¹; Dmitry Eskin²; *Alexander Vorozhtsov*¹; Sergey Kulkov¹; ¹Tomsk State University; ²Brunel University Brunel Centre for Advanced Solidification Technology (BCAST)

9:30 AM

Enhancing Tensile and Compressive Strength of AZ₄₁ Magnesium Alloy by Adding Nano-sized A₂O₃: *Md Ershadul Alam*¹; Abdelmagid Hamouda²; ¹King Fahd University of Petroleum and Minerals, Saudi Arabia; ²Qatar University

9:50 AM Break

10:10 AM Invited

Phase-field Modeling of Solidification in Light-metal Matrix Nanocomposites: *Tamás Pusztai*¹; László Rátkai¹; Attila Szállás¹; László Gránásky¹; ¹Wigner Research Centre for Physics

10:30 AM

Contactless Acoustic Wave Generation in a Melt by Electromagnetic Induction: Georgi Djambazov¹; Valdis Bojarevics¹; Bruno Lebon¹; *Koulis Pericleous*²; ¹University of Greenwich; ²University of Greenwich

10:50 AM

Brownian Motion Effects on the Particle Settling and Its Application to Solidification Front in Metal Matrix Composites: *Chang-Soo Kim*¹; J.B. Ferguson¹; Benjamin Schultz¹; Pradeep Rohatgi¹; ¹University of Wisconsin-Milwaukee

11:10 AM

Advanced Characterization of Metal Matrix Nano-composites: *Maher Mounib*¹; Williams Lefebvre¹; ¹Groupe de Physique des Matériaux (GPM)

11:30 AM

X-ray Tomography and Small-angle Neutron Scattering Characterization of Nano-composites: Static and In Situ Experiments: *Sofiane Terzi*¹; Rémi Daudin²; Julie Villanova³; Prakash Srirangam⁴; Pierre Lhuissier²; Hartmut Lemmel²; Elodie Boller³; Jean jacques Blandin²; Ralf Schweins⁶; Peter Lindner⁶; Peter Lee⁴; Luc Salvo²; ¹ESA; ²SIMAP; ³ESRF; ⁴University of Manchester; ⁵TU WIEN; ⁶ILL

Long-term Stability of High Temperature Materials — Surface Degradation II and Exposure Effects on Mechanical Behavior

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee

Program Organizers: Mark Hardy, Rolls-Royce plc; Awadh Pandey, Pratt & Whitney Rocketdyne; David Mourer, General Electric Aircraft Engines; Jeffrey Hawk, National Energy Technology Laboratory

Tuesday AM
February 18, 2014

Room: 4
Location: San Diego Convention Center

Session Chairs: Mark Hardy, Rolls-Royce plc; Jeffrey Hawk, National Energy Technology Laboratory; David Mourer, GE Aircraft Engines; Awadh Pandey, Pratt & Whitney Rocketdyne

8:30 AM

Effect of Surface Preparation on the Oxidation of Single Crystal Nickel-based Superalloys for Disk Applications: *Chantal Sudbrack*¹; Devon Beckett²; Rebecca MacKay¹; ¹NASA Glenn Research Center; ²NASA LERCIP - Drexel University

8:50 AM

Minimum Dwell Cycling and Its Effect on the Fatigue and Environmental Response of RR1000: *James O'Hanlon*¹; Mark Hardy²; Benjamin Foss³; Martin Bache¹; ¹Swansea University; ²Rolls-Royce plc; ³Imperial College

9:10 AM

Creep Behavior of Thin-walled Specimens - Experiment and Modelling: *Uwe Glatzel*¹; Matthias Bensch¹; Rainer Völkl¹; Ernst Affeldt²; Atsushi Sato³; Niels Warnken³; Roger Reed⁴; ¹University Bayreuth; ²MTU Aero Engines; ³University Birmingham; ⁴University Oxford

9:30 AM

Impact of γ' and Secondary Carbides Precipitations on Alloy 625 High Temperature Tensile and LCF Properties: Lorena Mataveli Suave¹; Denis Bertheau¹; *Jonathan Cormier*¹; Patrick Villechaise¹; Aurélie Soula²; Zéline Hervier³; Florence Hamon¹; Johanne Laigo⁴; ¹ENSMA / P' Institute - UPR CNRS 3346; ²Aircelle - Safran Group; ³Turbomeca - Safran Group; ⁴Snecma - Safran Group

9:50 AM

Long Term Thermal Stability of HAYNES 244 Alloy: *Michael Fahrman*¹; ¹Haynes International Inc.



10:10 AM Break**10:30 AM**

High Temperature Creep Behavior of Cross-weld Specimens of Weld Joint between T92 Martensitic and Super304H Austenitic Steels: Myung-Yeon Kim¹; Suk-Chul Kwak¹; Jung-Chel Chang²; *Jin-Yoo Suh*¹; Woo-Sang Jung¹; Young-Kook Lee³; ¹Korea Institute of Science and Technology; ²KEPCO Research Institute; ³Yonsei University

10:50 AM

Rejuvenation of Nickel-based Superalloys GTD444(DS) and René N5(SX): *Luke Rettberg*¹; Tresa Pollock¹; ¹University of California Santa Barbara

11:10 AM

Elevated Temperature Stress Relaxation in Ni-base Superalloys: *Jeffrey Evans*¹; Stephen Pierce¹; Alex McCool¹; ¹University of Alabama in Huntsville

11:30 AM

Factors Affecting the Corrosion Fatigue Life in Nickel-based Superalloys for Disc Applications: *Andrew Girling*¹; Hollie Rosier¹; Karen Perkins¹; Grant Gibson²; Jonathan Leggett²; ¹Swansea University; ²Rolls-Royce plc

Magnesium Technology 2014 — Deformation I

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Tuesday AM
February 18, 2014

Room: 17A
Location: San Diego Convention Center

Session Chairs: Fabrizio D'Errico, Polytecnico di Milano; Alok Singh, National Institute for Materials Science

8:30 AM

The Athermal Component of the Strength of Binary Mg Solid Solutions: *Saeideh Abaspour*¹; Carlos Caceres¹; ¹ARC Centre of Excellence for Design in Light Metals

8:50 AM

Crack Propagation under Bending in Cast Mg₁₀GdxNd-T₄ Alloys: *Petra Maier*¹; Chamini Mendis²; Martin Wolff²; Norbert Hort²; ¹University of Applied Sciences Stralsund; ²Helmholtz-Zentrum Geesthacht

9:10 AM

High Shear Deformation to Produce High Strength and Energy Absorption in Mg Alloys: *Vineet Joshi*¹; Saamyadeep Jana¹; Dongsheng Li¹; Hamid Garmestani²; Eric Nyberg¹; Curt Lavender³; ¹PNNL; ²Georgia Institute of Technology; ³Pacific Northwest National Laboratory

9:30 AM

As-cast Microstructure and Texture of Twin-roll Casting AZ₃₁: *Mohsen Masoumi*¹; Mihriban Pegguleryuz¹; ¹McGill University

9:50 AM

Post Deformation Annealing Behavior of Mg-Al-Sn Alloys: *Abu Syed Humayun Kabir*¹; Jing Su¹; Mehdi Sanjari¹; In-Ho Jung¹; Stephen Yue¹; ¹McGill University

10:10 AM Break**10:30 AM**

Acoustic Emission Analysis of Plane Strain Compressed Mg Single Crystals: *Daria Drozdenko*¹; Patrik Dobron¹; Michal Knapek¹; Dietmar Letzig²; Jan Bohlen²; František Chmelik¹; ¹Charles University in Prague; ²Helmholtz-Zentrum Geesthacht

10:50 AM

Precipitation Strengthening of a Mg-Zn Alloy in Tension and Compression: *Julian Rosalie*¹; Hidetoshi Somekawa¹; Alok Singh¹; ¹National Institute for Materials Science

11:10 AM

Characterization of Damage in Magnesium Using Digital Image Correlation and Electron Backscattered Diffraction Patterning: *Michael Nemcko*¹; Pauline Mas¹; Moisei Bruhis¹; David Wilkinson¹; ¹McMaster

University

11:30 AM

Low Cycle Fatigue Properties of Extruded Mg10GdxNd Alloys: *Gerhard Tober*¹; Petra Maier¹; Sören Müller²; Norbert Hort³; ¹University of Applied Sciences Stralsund; ²Extrusion Research and Development Center TU Berlin; ³Helmholtz-Zentrum Geesthacht

11:50 AM

Quantification of Microstructure-properties-behavior Relations in Mg Alloys Using a Hybrid Approach: *Kavan Hazeli*¹; Jefferson Cuadra¹; Prashanth Vanniamparambil¹; Rami Carmi¹; Antonios Kotsos¹; ¹Drexel University

Magnetic Materials for Energy Applications IV — Rare Earth Free Permanent Magnets

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Thomas G. Woodcock, IFW Dresden; Julia Lyubina, Evonik Industries AG; Matthew Willard, Case Western Reserve University

Tuesday AM
February 18, 2014

Room: Ballroom G
Location: San Diego Marriott Marquis & Marina

Session Chairs: Kazuhiro Hono, NIMS; George C. Hadjipanayis, University of Delaware

8:30 AM Invited

Recent Developments in Rare Earth Lean/Free High Energy Magnets: *George Hadjipanayis*¹; ¹University of Delaware

9:00 AM Invited

Nanoscale and Atomic Structuring of Permanent Magnets: *Ralph Skomski*¹; Priyanka Manchanda²; Pankaj Kumar²; B. Balamurugan¹; Arti Kashyap²; Jeff Shield¹; Laura Lewis³; D. Sellmyer¹; ¹University of Nebraska; ²Indian Institute of Technology Mandi; ³Northeastern University

9:30 AM

Metallurgical Synthesis of Extraterrestrial Permanent Magnet – Tetrataenite, Tt (FeNi L1₀): *Arif Mubarak*¹; Roger Ristau²; Eric Poirier³; Nina Bordeaux⁴; Nicole Ellison³; M Balogh³; Frederick Pinkerton³; Laura Lewis⁴; Joseph Goldstein¹; ¹University of Massachusetts; ²University of Connecticut; ³GM R&D Center; ⁴Northeastern University

9:50 AM

Fabrication of α'' -Fe₁₆N₂ Bulk Magnets by High-pressure Warm Compaction: *Kenta Takagi*¹; Misaho Akada²; Kimihiro Ozaki¹; Naoya Kobayashi³; Tomoyuki Ogawa⁴; Migaku Takahashi⁴; ¹National Institute of Advanced Industrial Science and Technology; ²Research Association of Magnetic Materials for High-Efficiency Motors; ³T&T Innovations Inc.; ⁴Tohoku University

10:10 AM Break**10:25 AM**

Development of MnBi Permanent Magnet: *Jun Cui*¹; Matthew Kramer²; Guosheng Li¹; Melania Marinescu³; Jungpyung Choi¹; Ichiro Takeuchi⁴; Evgueni Polikarpov¹; Jens Darsell¹; Jared Templeton¹; Hayden Reeve⁵; Ping Liu⁶; ¹Pacific Northwest National Laboratory; ²AMES Laboratory; ³Electron Energy Corp.; ⁴University of Maryland; ⁵United Technologies Research Center; ⁶University of Texas at Arlington

10:45 AM

Processing Effects on High Temperature Microstructure and Magnetic Properties of Alnico 8 Alloys: *Haley Dillon*¹; Ramya Chandrasekar¹; Andriy Palasyuk¹; Iver Anderson¹; William McCallum¹; ¹Ames Laboratory

11:05 AM

High Temperature X-ray Diffraction Characterization of Alnico 8 Made by Pre-alloyed Powder Processing: *Ramya Chandrasekar*¹; Haley Dillon¹; Matthew Besser¹; Andriy Palasyuk¹; R. William McCallum¹; Matthew Kramer¹; Iver Anderson¹; ¹Ames Laboratory

11:25 AM

Microstructural Characterization of Gas Atomized Alnico Alloys: *Lin Zhou¹*; Trevor Bailey¹; H. Dillon¹; R. Chandrasekar¹; R. McCallum¹; Iver Anderson¹; M. Kramer¹; ¹Ames Lab

11:45 AM

Effects of Cr-Ga Substitution on Structural and Magnetic Properties of Hexaferrite (BaFe₂O₁₉) Synthesized by Sol-gel Auto-combustion Route: *Ihsan Ali¹*; ¹Bahauddin Zakariya University

Materials and Fuels for the Current and Advanced Nuclear Reactors III — Structural Materials I

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

Program Organizers: Ramprasad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Tuesday AM
February 18, 2014

Room: 33C
Location: San Diego Convention Center

Session Chair: Kumar Sridharan, University of Wisconsin

8:30 AM Invited

Materials Challenges in Next Generation Nuclear Reactors: *Korukonda Murty¹*; Apu Sarkar¹; ¹North Carolina State University

8:55 AM

Alloy Selection for Accident Tolerant Fuel Cladding in Commercial Light Water Reactors: *Raul Rebak¹*; ¹GE Global Research

9:10 AM

Development and Testing Advanced Ferritic Steels for Fast Reactor Applications: *Stuart Maloy¹*; Osman Anderoglu¹; Tarik Saleh¹; Mychailo Toloczko²; G. Odette³; Thak Byun⁴; David Hoelzer⁴; ¹Los Alamos National Laboratory; ²PNNL; ³UCSB; ⁴ORNL

9:25 AM

Mechanical Properties of Irradiated T91 Alloy from the MEGAPIE Experiment: *Tarik Saleh¹*; Stuart Maloy¹; Yong Dai²; Tobias Romero¹; ¹Los Alamos National Laboratory; ²Paul Scherrer Institut

9:40 AM

Steel Corrosion Tests in Flowing Lead-bismuth Eutectic in LANL DELTA Loop: *Magda Caro¹*; Keith Woloshun¹; Floren Rubio¹; Stuart A. Maloy¹; Peter Hosemann²; ¹Los Alamos National Laboratory; ²University of California, Berkeley

9:55 AM Break

10:15 AM

The Recovery of Irradiation Damage for Zircaloy-2 and Zircaloy-4 Following Low Dose Neutron Irradiation at Nominally 358°C: *Brian Cockeram¹*; Keith Leonard²; TS Byun²; Lance Snead²; Jim Hollenbeck¹; ¹Bechtel-Bettis; ²Oak Ridge National Laboratory

10:30 AM

Similar and Dissimilar Friction Stir Welding of ODS and RAFM Steels: *Zhenzhen Yu¹*; Zhili Feng¹; David Hoelzer¹; Lizhen Tan¹; Mikhail Sokolov¹; Ken Littrell¹; ¹Oak Ridge National Laboratory

10:45 AM

Microstructure Evolution in Advanced Ferritic-martensitic Steels Following Friction Stir Welding: *Bradford Baker¹*; Terry McNeley¹; Luke Brewer¹; ¹Naval Postgraduate School

11:00 AM

Aspects of Dynamic Strain Aging in HT-9 Steel: *Apu Sarkar¹*; Stuart Maloy²; T.S. Byun³; K.L. Murty¹; ¹North Carolina State University; ²Los Alamos National Laboratory; ³Oak Ridge National Laboratory

11:15 AM

Influence of Neutron Irradiation on the Segregation of Alloying Elements in Zirconium Alloys: *Elisabeth Francis¹*; Sarah Haigh¹; Michael Preuss¹; ¹The University of Manchester

11:30 AM

PWSSC of Alloy 600 with Water Environment: *Young Suk Kim¹*; Wan Young Maeng¹; Sung Soo Kim¹; ¹Korea Atomic Energy Research Institute

Materials for High-temperature Applications: Next Generation Superalloys and Beyond — Next Generation High-Temperature Materials

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Refractory Metals Committee

Program Organizers: Omer Dogan, DOE National Energy Technology Laboratory; Panos Tsakiroopoulos, University of Sheffield; Xingbo Liu, West Virginia University; Paul Jablonski, DOE National Energy Technology Lab; Junpin Lin, University of Science and Technology Beijing

Tuesday AM
February 18, 2014

Room: 6D
Location: San Diego Convention Center

Session Chairs: Donna Ballard, U.S. Air Force; Jim Ciulik, M&M Engineering Associates

8:30 AM Invited

What Next in Gas Turbine Materials: *Jeffrey Hawk¹*; ¹U.S. Department of Energy, National Energy Technology Laboratory

9:00 AM Invited

DOD Needs and Payoffs for Materials Beyond Ni-superalloys: *David Shifler¹*; ¹Office of Naval Research

9:30 AM Invited

Very High-Temperature Nb-and Mo-based Silicides: *B. P. Bewlay¹*; PR Subramanian¹; ¹GE Global Research

10:00 AM Break

10:15 AM Invited

Coatings for Superalloy Components: *David Young¹*; ¹University of New South Wales

10:45 AM Invited

Understanding the Effects of Rhenium in Ni-base Superalloys: *Zi-Kui Liu¹*; Shunli Shang¹; Yi Wang¹; Xuan Liu¹; ¹The Pennsylvania State University

11:15 AM Invited

Structure and Mechanical Properties of a High Entropy Refractory Metal Alloy: *Michael Widom¹*; ¹Carnegie Mellon University

11:45 AM Invited

Low Density Refractory High Entropy Alloys: *Oleg Senkov¹*; Christopher Woodward¹; Daniel Miracle¹; Jaimie Tiley¹; ¹Air Force Research Laboratory, Materials and manufacturing Directorate

Materials Processing Fundamentals — Metal Extraction

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: James Yurko, Materion Brush Beryllium and Composites; Lifeng Zhang, University of Science and Technology Beijing; Antoine Allanore, Massachusetts Institute of Technology; Cong Wang, Northwestern University

Tuesday AM
February 18, 2014

Room: 11B
Location: San Diego Convention Center

Session Chair: Antoine Allanore, MIT

8:30 AM

Oxidative and Carbonative Precipitation of Iron from Manganese Leach Solutions: *Enis Sevim¹*; *Selim Ertürk¹*; Cuneyt ARSLAN¹; ¹Istanbul Technical University



8:50 AM

Study on Microorganisms and Select a Suitable Bacterial Culture for Bioleaching of Low Grade Sulfide Copper Ore: *Hossein Etmnan*¹; Hekmat Razavizadeh²; ¹GolGohar Mining & Industrial Company; ²IUST

9:10 AM

Upgrading Titanium Ore through Selective Chlorination Using Titanium Tetrachloride: *Jungshin Kang*¹; Toru Okabe¹; ¹The University of Tokyo

9:30 AM

A Sintering Ore Blending Optimization Model Based on ‘Iron Increase and Silicon Reduction’ Ore Dressing Processes: Chengsong Liu¹; Jingshe Li¹; Haiyan Tang¹; Wei Liu¹; *Linzhu Wang*¹; ¹University of Science and Technology Beijing

9:50 AM Break

10:00 AM

Electrodeposition of Cobalt from Air and Water-stable Ionic Liquid 1-Butyl-3-Methylimidazolium Tetrafluoroborate: *Min Li*¹; Zhaiwen Wang¹; Ramana Reddy¹; ¹The University of Alabama

10:20 AM

Effects of Ultrasound on the Al₂O₃ Extraction Rate during Acid Leaching Process of Coal Fly Ash: Kang Liu¹; Jilai Xue¹; *Wenbo Luo*¹; ¹University of Science and Technology Beijing

10:40 AM

Fundamental Study on New Dissolution Process for Platinum Group Metals Using Molten Salt Electrolysis: *Katsuhiko Nose*¹; Toru Okabe¹; ¹Institute of Industrial Science, The University of Tokyo

11:00 AM

New Chlorination Technique for Recycling Titanium Metal Scraps by Using Reaction Mediator: *Yuki Hamanaka*¹; Yu-ki Taninouchi¹; Toru Okabe¹; ¹University of Tokyo

11:20 AM

Separation of Nickel and Cobalt in Acidic Aqueous Solution by Selective Reduction of Metals.: *Sakae Shirayama*¹; Tetsuya Uda¹; ¹Kyoto University

Mechanical Behavior at the Nanoscale II — Size and Rate Effects

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

Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Tuesday AM

Room: 9

February 18, 2014

Location: San Diego Convention Center

Session Chairs: Ting Zhu, Georgia Institute of Technology; Gerhard Dehm, Max-Planck-Institut für Eisenforschung

8:30 AM Invited

Effects of External vs Internal Length Scales on Strength of Small Metallic Materials: *Alfonso Ngan*¹; R. Gu¹; X.X. Chen¹; P.S.S. Leung¹; ¹University of Hong Kong

9:00 AM Invited

From Idealized Bi-crystals towards Applied Polycrystals: Plastic Deformation in Small Dimensions: *Gerhard Dehm*¹; Peter Imrich²; Alexander Wimmer³; Christoph Kirchlechner¹; ¹Max-Planck-Institut für Eisenforschung; ²Erich Schmid Institut fuer Materialwissenschaft, Oesterreichische Akademie der Wissenschaften; ³Kompetenzzentrum Automobil- und Industrietechnik

9:30 AM

Nanindentation Study of Iron Nanoparticles Produced by Solid State Dewetting: Oleg Kovalenko¹; Julia Greer²; Seok-Woo Lee²; *Eugen Rabkin*¹; ¹Technion; ²California Institute of Technology

9:50 AM

Size Dependence of Strength and Plasticity in Nb₂₅Mo₂₅Ta₂₅W₂₅ Refractory High-entropy Alloy: *Yu Zou*¹; Ralph Spolenak¹; Soumyadipta

Maiti²; Walter Steurer²; ¹Laboratory for Nanometallurgy, Department of Materials, ETH Zurich.; ²Laboratory of Crystallography, Department of Materials, ETH Zurich

10:10 AM Break

10:30 AM Invited

Predicting the Rate of Dislocation Cross Slip: *Wei Cai*¹; Jie Yin¹; Keonwook Kang²; William Kuykendall¹; ¹Stanford University; ²Yonsei University

11:00 AM

Crystal Plasticity Model for BCC Iron Atomistically Informed by Kinetics of Correlated Kinkpair Nucleation on Screw Dislocations: Sankar Narayanan¹; David McDowell¹; *Ting Zhu*¹; ¹Georgia Institute of Technology

11:20 AM

Mechanical Properties of Solid-state-dewetted Iron Nanoparticles at Cryogenic Temperatures: *Seok-Woo Lee*¹; Oleg Kovalenko²; Eugen Rabkin²; Julia Greer¹; ¹California Institute of Technology; ²Technion-Israel Institute of Technology

11:40 AM

The Relation between Slip and Slip Traces in bcc Microcompression Experiments: *Helena Van Swygenhoven*¹; Cecile Marichal¹; Steven Van Petegem¹; Camelia Borca¹; ¹Paul Scherrer Institut

Multiscale Approaches to Hydrogen-assisted Degradation of Metals — Experimental Characterisation of H-assisted Damage

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

Program Organizers: Nicholas Winzer, Fraunhofer IWM; Matous Mrovec, Fraunhofer IWM; Brian Somerday, Sandia National Laboratories; Petros Sofronis, University of Illinois; David Bahr, Purdue University; Srinivasan Rajagopalan, ExxonMobil Research and Engineering Company

Tuesday AM

Room: 11A

February 18, 2014

Location: San Diego Convention Center

Session Chairs: David Bahr, Purdue University; Brian Somerday, Sandia National Laboratories

8:30 AM Invited

Embrittlement Measures in Fe-base Systems Appropriate to Multiscale Models: *William Gerberich*¹; Eric Hintsala¹; ¹University of Minnesota

9:10 AM

Slip Transmission and Mechanical Behavior of Ni-alloys in the Presence of Hydrogen: *Samantha Lawrence*¹; Brian Somerday²; Neville Moody²; David Bahr¹; ¹Purdue University; ²Sandia National Laboratories

9:30 AM

Hydrogen-induced Strain Localization at Meso-scale in Austenitic Stainless Steels: *Yuriy Yagodzinsky*¹; Hannu Hänninen¹; ¹Aalto University School of Engineering

9:50 AM

The Role of VC Precipitates in Hydrogen Assisted Cracking of Vanadium Modified 2γ4Cr1Mo Steel: *Kevin Nibur*¹; Sylvain Pillot²; Brian Somerday³; Richard Gangloff⁴; ¹Hy-Performance Materials Testing, LLC.; ²Industeel, ArcelorMittal; ³Sandia National Laboratory; ⁴University of Virginia

10:10 AM Break

10:30 AM

Designing Steels Combining Ultra-strength and Hydrogen Resistance: *Pedro Rivera-Diaz-del-Castillo*¹; ¹University of Cambridge

11:10 AM

Embrittlement Characteristics of Electrochemically Hydrogenated 4340 Steel: *Mobbassar Sk*¹; Ruel Overfelt¹; Jeffrey Fergus¹; ¹Auburn University

11:30 AM

Hydrogen Environment Assisted Cracking (HEAC) of Modern Ultra-high Strength Stainless Steel: *Greger Pioszak*¹; Richard Gangloff¹; ¹University of Virginia

Nanostructured Materials for Rechargeable Batteries and Supercapacitors II — Session III

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Energy Conversion and Storage Committee

Program Organizers: David Mitlin, University of Alberta and NINT NRC; Reza Shahbazian-Yassar, Michigan Technological University; Peter Kalisvaart, University of Alberta and NINT NRC

Tuesday AM
February 18, 2014

Room: Ballroom F
Location: San Diego Marriott Marquis & Marina

Session Chairs: David Mitlin, University of Alberta; Husam AlShareef, King Abdullah University of Science and Technology

8:30 AM Invited

The LiFePO₄ Story: Theory, Experiment and Characterization: Fredrick Omenya¹; Natasha Chernova¹; Shirley Meng²; Peter Khalifah³; Aziz Abdellahi⁴; Gerbrand Ceder²; *M. Whittingham*¹; ¹SUNY at Binghamton; ²UC San Diego; ³Stony Brook University; ⁴MIT

8:45 AM Invited

Electrode Material Design & Surface Passivation Strategies for Energy Storage Applications: *Husam Alshareef*¹; ¹King Abdullah University for Science & Technology (KAUST)

9:00 AM Invited

High Power and Energy Density Secondary Batteries and Supercapacitors Based on Three-dimensionally Mesostructured Current Collectors: *Paul Braun*¹; ¹University of Illinois at Urbana-Champaign

9:15 AM Invited

Improvement in Both Power and Energy Density of Carbon-based Supercapacitors: *Feng Li*¹; Zhe Weng¹; Dawei Wang²; Hui-Ming Cheng¹; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Res., CAS; ²The University of Queensland

9:30 AM Invited

Carbon Nanosheet Frameworks Derived from Peat Moss as High Capacity Intercalation Sodium Ion Battery Anodes: *David Mitlin*¹; ¹University of Alberta and NINT NRC

9:50 AM Invited

Nanostructured Metal Hydrides as Efficient Anode Materials for Advanced Batteries: *Michel Latroche*¹; Fermin Cuevas¹; Junxian Zhang¹; ¹CNRS

10:05 AM Break

10:20 AM Invited

The Role and Application of Quantum Capacitance in Nanostructured Energy Storage Devices: *Hidenori Yamada*¹; Prabhakar Bandaru¹; ¹UC San Diego

10:35 AM Invited

Improved Performance of Graphite/ LiNi_{0.5}Mn_{1.5}O₄ Cells with Electrolyte Additives: *Brett Lucht*¹; Mengqing Xu¹; ¹University of Rhode Island

10:50 AM Invited

Nanophase Separated Versus Solid Solution Features of the Layered: Layered Composite Li₂MnO₃-LiMO₂ (M=Mn, Ni, Co) for Cathodes in Li-ion Batteries: *William West*¹; ¹Jet Propulsion Laboratory

11:05 AM Invited

Silicon-based Electrodes for Li-ion Batteries: Spectroscopic Analysis for Improved Performance: *Christopher Hinkle*¹; Amandeep Sra¹; Joseph Rossi¹; Roberto Longo¹; KJ Cho¹; ¹University of Texas at Dallas

11:20 AM Invited

Processing and Structure of Graphene Composites for Supercapacitor Applications: *Lu-Chang Qin*¹; Jie Tang²; ¹University of North Carolina at Chapel Hill; ²National Institute for Materials Science

11:35 AM Invited

Atom Probe Tomography Study on SiO Anode Materials before and after the First Li Insertion/Extraction Cycle: *Hossein Sepehri Amin*¹; T. Ohkubo¹; H. Yamamura²; T. Saito²; H. Iba²; K. Hono¹; ¹National Institute for Materials Science (NIMS); ²Battery Research Division, Higashi Fuji Technical Center, Toyota Motor Corporation

11:50 AM Invited

High Rate Performing Lithium-ion Batteries: *Palani Balaya*¹; ¹National University of Singapore

Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World — Advanced Structural Mapping

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

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH; Brent Fultz, California Institute of Technology; Peter Liaw, The University of Tennessee

Tuesday AM

February 18, 2014

Room: 10

Location: San Diego Convention Center

Session Chairs: Wolfgang Pantleon, Riso National Laboratory and DTU; Andrew Allen, NIST

8:30 AM Keynote

Advanced Synchrotron X-ray Studies of Recrystallization: *Dorte Jensen*¹; Yubin Zhang¹; ¹DTU

9:10 AM

In Situ Synchrotron Diffraction Characterization of Stressed and Highly-faulted, Nanocrystalline Ni(W) Thin Films; Effect of Tensile Loading and Thermal Cycling: *Silke Kurz*¹; Andreas Leineweber¹; Udo Welzel¹; Eric Mittemeijer²; ¹Max Planck Institute for Intelligent Systems; ²Max Planck Institute for Intelligent Systems (formerly for Metals Research) and Institute for Materials Science, University of Stuttgart

9:25 AM Invited

Long Range Internal Stresses in ECAP Aluminum Alloys: Michael Kassner¹; Lyle Levine²; Thien Phan¹; *Yvonne Lee*¹; Terence Langdon¹; Yi Huang³; ¹University of Southern California; ²NIST; ³University of Southampton

9:50 AM Invited

A Novel View on Fatigue Damage at the Micron Scale by In Situ X-ray μ Laue Diffraction: *Christoph Kirchlechner*¹; Christian Motz²; Peter Imrich³; Gerhard Dehm¹; ¹Max-Planck-Institut für Eisenforschung GmbH; ²Universität des Saarlandes; ³University of Leoben

10:15 AM Break

10:30 AM Invited

Hard X-ray Microscopy: Multiscale Structural Mapping: *Henning Poulsen*¹; Hugh Simons¹; Andrew King²; Wolfgang Ludwig²; Wolfgang Pantleon¹; Frederik Stöhr¹; Søren Schmidt¹; Erik Lauridsen¹; Irina Snigireva²; Anatoly Snigirev²; Carsten Detlefs²; ¹DTU; ²ESRF

10:55 AM Invited

Measuring Strains In Operando in Alloy-based Anodes for Lithium Ion Batteries Using X-ray Diffraction: *David Dunand*¹; Matthew Glazer¹; Jiung Cho²; Jonathan Almer³; John Okasinski³; Paul Braun²; ¹Northwestern University; ²University of Illinois at Urbana-Champaign; ³Argonne National Laboratory

11:20 AM Invited

In Situ Characterization of Grade 92 Steel during Tensile Deformation Using Wide Angle and Small Angle X-ray Scattering: *Leyun Wang*¹; Meimei Li¹; Jonathan Almer¹; ¹Argonne National Laboratory



11:45 AM

Internal Stresses in the AA7449 Aluminium Alloy Exhibiting Different Precipitation Microstructures Investigated by Neutron and X-ray Diffraction: *Patrick Schloth*¹; Julia Repper²; Jean-Marie Drezet¹; Helena Van Swygenhoven²; ¹EPFL; ²Paul Scherrer Institut

Pb-free Solders and Emerging Interconnect and Packaging Materials — Issues in 3-D Packages

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch Automovltve

Tuesday AM
February 18, 2014

Room: 5B
Location: San Diego Convention Center

Session Chairs: Fan-Yi Ouyang, National Tsing Hua University; Kwang-Lung Lin, National Cheng Kung University

8:30 AM

Role of Joint Scale and Processing on Fracture of Solder Microbumps in 3D Packages: *Zhe Chen*¹; Zhe Huang¹; Indranath Dutta¹; ¹Washington State University

8:50 AM

Effect of Temperature on the Electromigration Failure Mode of Microbumps in 3D IC Packaging: *Li-Yun Chang*¹; Chih Chen¹; Nicholas Kao²; Eason Chen²; Daniel Lee²; Mike Ma²; ¹National Chiao Tung University; ²Siliconware Precision Industries Co., Ltd.

9:10 AM

Evaluation of Reliability by Thermal Shock of 3D Stacked Chips with TSV Filled Sn and Micro-bump: *Young-Ki Ko*¹; Yong-Ho Ko¹; Hiroyuki Kokawa²; Yutaka S. Sato²; Chang-Woo Lee¹; ¹Korea Institute of Industrial Technology; ²Tohoku University

9:30 AM

T/C Reliability of Current Assisted Cu-Cu Direct Bonding on the Contact Resistance: *Sung Woo Ma*¹; Chanho Shin¹; Jae-Yong Park¹; Jeong Hwan Lee²; Ki Bum Kim²; Minsuk Suh²; Namseog Kim²; Young-Ho Kim¹; ¹Hanyang University; ²SK Hynix Semi.

9:50 AM

Growth Mechanism of (Cu,Ni)₃Sn in Space-confined Ni/Sn/Cu Diffusion Couples: *Wen-Lin Shih*¹; C. Robert Kao¹; ¹National Taiwan University

10:10 AM Break

10:30 AM

Size Confinement Governed Solder Alloys Hardening and Eutectic Region Refinements in Cu/SnAgCu/Ni and Cu/SnAg/Ni Assembly Joints: *Cheng-Ying Ho*¹; Jenq-Gong Duh¹; ¹National Tsing Hua University

10:50 AM

Metallurgies Evaluation (Sn vs. SnCu0.7% vs. SnAg) for 3D Bumping and Stacking: *George Vakanas*¹; Teng Wang²; Koji Tatsumi³; Erik Jan Marinissen²; Kenneth Rebibis²; Vladimir Cherman²; Kristof Croes²; Fay Hua¹; Ingrid De Wolf²; Eric Beyne²; ¹Intel Corporation; ²imec; ³Mitsubishi Materials Corporation

11:10 AM

Intermetallic Compound Growth Behavior during Multiple Reflows of Ni/SnAg/Ni and Cu/SnAg/Ni Microbumps in Three-dimensional Integrated Circuits: *Yu-An Shen*¹; Yuan-Wei Chang¹; Chih Chen¹; Nicholas Kao²; Eason Chen²; Daniel Lee Lee²; Mike Ma²; ¹National Chiao Tung University; ²Siliconware Precision Industries Co., Ltd.

11:30 AM

Study of Interfacial Reactions between Cu Substrate and Lead-free Solders with Low Solder Volume for 3D IC Integration: *Ting-Li Yang*¹; C. R. Kao¹; ¹National Taiwan University

Phase Transformation and Microstructural Evolution — Carbon Redistribution in Steels II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Tuesday AM
February 18, 2014

Room: 31C
Location: San Diego Convention Center

Session Chairs: Frédéric Danoix, Université de Rouen; Chad Sinclair, University of British Columbia

8:30 AM Invited

First-principle Calculations of Carbon and Nitrogen Precipitation in Niobium-bearing Iron Alloys: *David Tingaud*¹; Philippe Maugis²; Frederic Danoix; ¹University Paris; ²Aix-Marseille University

9:00 AM Invited

Theoretical Description of the Interplay between Interstitial and Substitutional Ordering and Clustering in Ferritic and Austenitic Iron-based Alloys: *Marcel Sluiter*¹; Satoshi Iikubo²; Hiroshi Ohtani³; ¹TU Delft; ²Kyushu Institute of Technology; ³Tohoku University

9:30 AM

Coupled Carbon Diffusion and Precipitation in a Dissimilar Steel Weld : Modelling and Characterization: *Fanny Mas*¹; Yao Shan²; Catherine Tassin¹; Ernst Kozeschnik²; François Roch³; Patrick Todeschini⁴; Yves Bréchet¹; ¹SIMAP Laboratory; ²Institute of Materials Science and Technology; ³Areva NP; ⁴EDF R&D

9:50 AM

Crystallisation and Phase Transformations in Sputtered Fe-C Amorphous Films: *Xavier Sauvage*¹; Amélie Fillon¹; Ben Lawrence²; Elisa Cantergiani³; Arnaud Weck³; Michel Perez⁴; Colin Scott⁵; Chad Sinclair²; ¹University of Rouen, CNRS; ²Department of Materials Engineering - UBC; ³Mechanical Engineering Department, University of Ottawa; ⁴MATEIS - UMR CNRS 5510 - INSA Lyon; ⁵AREVA

10:10 AM Break

10:25 AM

Redistribution of Carbon in Extraterrestrial Metal: Fe-Ni-C Alloys: *Joseph Goldstein*¹; Gary Huss²; Edward Scott²; ¹University of Massachusetts, Amherst; ²University of Hawaii

10:45 AM Invited

Static and Dynamical Aging Processes at Room Temperature in a Fe25Ni0.4C Virgin Martensite: Effect of C Redistribution at the Nanoscale: *Sébastien Allain*¹; Frederic Danoix; M. Goune²; K. Hoummada³; D. Mangelink³; ¹TMS; ²Université de Bordeaux; ³Aix-Marseille Université

11:15 AM Invited

Carbon Super-saturation and Tetragonal Bainitic Ferrite in Nanocrystalline Bainitic Steels: *Francisca Caballero*¹; Michael Miller²; Hung-Wei Yen³; Jose Antonio Jimenez¹; Carlos Garcia-Mateo¹; Lucia Morales-Rivas¹; Jer-Ren Yang⁴; ¹Spanish National Research Center for Metallurgy (CENIM-CSIC); ²Oak Ridge National Laboratory (ORNL); ³The University of Sydney; ⁴National Taiwan University

11:45 AM

Carbon Redistribution during Low Temperature Tempering of Martensite: Microstructure and Mechanical Properties: *Chad Sinclair*¹; Guillaume Badinier²; Xavier Sauvage³; Sébastien Allain⁴; Mohamed Goune⁵; ¹University of British Columbia; ²APERAM Stainless Steel Research Centre; ³University of Rouen; ⁴Arcelormittal Maizieres Research SA; ⁵Université Bordeaux

12:05 PM

Effects of Carbon Addition on Deformation Behavior of High Mn Steels: *Soo Yeol Lee*¹; Ki Hyuk Kwon²; Jae Suk Jeong³; Wanchuck Woo⁴; Nack J. Kim²; ¹Chungnam National University; ²POSTECH; ³Doosan Heavy Industries & Construction Co., Ltd.; ⁴Korea Atomic Energy Research Institute

Progress Towards Rational Materials Design in the Three Decades Since the Invention of the Embedded Atom Method: An MPMD Symposium in Honor of Dr. Michael I Baskes — Advances in Atomistic Simulations - I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS; Nanomechanical Materials Behavior Committee
Program Organizers: Srinivasan Srivilliputhur, University of North Texas; Amit Misra, Los Alamos National Laboratory; Neville Moody, Sandia National Laboratories; Stephen Foiles, Sandia National Laboratories; Mark Asta, University of California; Alan Needleman, University of North Texas

Tuesday AM
February 18, 2014

Room: 30E
Location: San Diego Convention Center

Session Chairs: Neville Moody, Sandia National Laboratories; Blas Uberuaga, Los Alamos National Laboratory; Vasek Vittek, University of Pennsylvania

8:30 AM Keynote

Designing High-strength and Ductile Nanostructured Alloys with the Help of Computational Modeling: *Yuntian Zhu*¹; ¹North Carolina State University

9:00 AM Invited

Atomic-scale Origins of Hydrogen Embrittlement in Fe and Ni: *W Curtin*¹; Jun Song²; ¹EPFL; ²McGill University

9:20 AM Invited

Improved Calculation of Vibrational Mode Lifetimes in Anharmonic Solids: *Murray Daw*¹; ¹Clemson University

9:40 AM Invited

Simulations at Scale and Beyond: *David Srolovitz*¹; Zhaoxuan Wu²; Emanuel Lazar¹; Yongwei Zhang²; ¹University of Pennsylvania; ²Institute of High Performance Computing

10:00 AM Break

10:20 AM

Mesoscale Modeling of the Tensile Response of bcc Fe and Mo in the Athermal Regime: *Ronan Madec*¹; Ladislav Kubin²; ¹CEA; ²LEM (CNRS/ONERA)

10:40 AM Invited

Simulations of Dislocation Motion at Experimentally Realistic Stresses: *Tom Swinburne*¹; Sergei Dudarev²; Mark Gilbert²; Steve Fitzgerald²; Adrian Sutton¹; ¹Imperial College London; ²EURATOM/CCFE Fusion Association

11:00 AM Invited

Atomic-scale Modeling of Dislocation Nucleation from FCC-BCC Interfaces: *Irene Beyerlein*¹; Jian Wang¹; Ruifeng Zhang¹; ¹Los Alamos National Laboratory

11:20 AM Invited

Quantitative Simulation of Surface Segregation Phenomena in Metallic Alloys Using the Modified Embedded Atom Method: *Guofeng Wang*¹; Zhiyao Duan¹; Yinkai Lei¹; ¹University of Pittsburgh

11:40 AM Invited

Connecting Interatomic Potentials with Grain Boundary Energetics and Deformation: *Diana Farkas*¹; ¹Virginia Tech

Rare Metal Extraction & Processing Symposium — Calcium and Rare Earth Metallurgy

Sponsored by: Associação Brasileira de Metalurgia, Materiais e Mineração – ABM, Chinese Society for Metals, Metallurgy and Materials Society of CIM, Institute of Materials, Minerals and Mining, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Neale Neelameggham, Ind LLC; Shafiq Alam, Memorial University of Newfoundland; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto, Kennecott Utah Copper Refinery

Tuesday AM
February 18, 2014

Room: 16B
Location: San Diego Convention Center

Session Chairs: Neale R Neelameggham, IND LLC; Bing Li, East China University of Science and Technology

8:30 AM Introductory Comments

8:40 AM Invited

Calcium Reductants – A Historical Review: Neale Neelameggham¹; *Robert Brown*²; Brian Davis³; ¹Ind LLC; ²Magnesium Assistance Group; ³Brian Davis Associates Consulting

9:00 AM

Research on the Electrochemical Behavior of CaO in CaCl₂-CaF₂ System in Preparation of Al-Ca Alloys by Fused Salt Electrolysis: *Li Jidong*¹; Cao Wenliang²; Zhang Mingjie²; Wang Yiyong¹; ¹Liaoning University of Science and Technology; ²School of Materials and Metallurgy, Northeastern University

9:20 AM

Recovery of Rare Earth Metals (REMs) from Primary and Secondary Resources: A Review: *Vinay Kumar*¹; Manis Kumar Jha¹; Archana Kumari¹; Rekha Panda¹; J. Rajesh Kumar²; Jin Young Lee²; ¹CSIR-National Metallurgical Laboratory; ²Korea Institute of Geoscience and Mineral Resources (KIGAM)

9:40 AM

Mutual Separation of Rare Earths Using Chemically Modified Chitosan Immobilized with Functional Groups of Chelating Agents: *Katsutoshi Inoue*¹; Shafiq Alam²; ¹Saga University; ²Memorial University

10:00 AM Break

10:20 AM

Electrochemistry for Nd Electrowinning from Fluoride-oxide Molten Salts: *Bing Li*¹; ¹East China University of Science and Technology

10:40 AM

Recovery of Rare Earth Metals from Wasted Magnet: *Takashi Nagai*¹; Tatsuki Uzawa¹; ¹Chiba Institute of Technology

11:00 AM

Environment-friendly Recycling Process for Rare Earth Metals in End-of-life Electric Products: *Tomonori Saeki*¹; Tomohiko Akahori¹; Yu Miyamoto¹; Masayuki Kyoi¹; Masahide Okamoto¹; Yuzo Hiroshige¹; Takeshi Nemoto¹; Toru Okabe²; ¹Hitachi Ltd.; ²The University of Tokyo

11:20 AM

Assessment of Environmental Impact of Rare Earth Metals Recycling from Used Magnets: *Tomohiko Akahori*¹; Yuzo Hiroshige¹; Masaharu Motoshita²; Hiroki Hatayama²; Kiyotaka Tahara²; ¹Hitachi, Ltd.; ²AIIST



Ultrafine Grained Materials VIII — Young Scientist I: Deformation and Failure Mechanisms

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Lavernia, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Tuesday AM
February 18, 2014

Room: 6E
Location: San Diego Convention Center

Session Chairs: Gerhard Wilde, University of Muenster; Qiuming Wei, University of North Carolina - Charlotte

8:30 AM

Strain Rate and Temperature Effects on Uniaxial Deformation and Fracture of Copper with Preferentially Oriented Nanoscale Twins: *Zesheng You*¹; Lei Lu¹; Ke Lu¹; ¹Institute of Metal Research, Chinese Academy of Sciences

8:45 AM

Oxide Particle vs. Carbon Doped Nickel: Two Strategies to Stabilize Nanocrystallites: *Oliver Renk*¹; Anton Hohenwarter²; Reinhard Pippan¹; ¹Erich Schmid Institute of Materials Science; ²University of Leoben

9:00 AM

Low Temperature Process Optimization for Ultra-fine Grained Mg-3Al-1Zn Alloy: *Ebubekir Dogan*¹; Matthew Vaughan¹; Ibrahim Karaman¹; ¹Texas A&M University

9:15 AM

Deformation Behavior of ZK₆₀ Magnesium Alloy Processed by High-pressure Torsion at Elevated Temperatures: *Seyed Alireza Torbati Sarraf*¹; Terence Langdon¹; ¹University of Southern California

9:30 AM

Effect of Strain Rate and Grain Size on the Deformation Mechanism of Ultrafine-grained Al Alloy Produced via FSP: *Mageshwari Komarasamy*¹; Rajiv Mishra¹; ¹University of North Texas

9:45 AM

In Situ Micro Compression Testing of Ultra Fine Grain, Ultra High Purity Copper: A Size Effect Study: *Cameron Howard*¹; Chansun Shin²; Bill Choi³; Scott Parker¹; Peter Hosemann¹; David Frazer¹; Amanda Lupinacci¹; ¹UC Berkeley; ²Myongji University; ³LLNL

10:00 AM Break

10:15 AM

Influence of Processing Deformation Mode on UFG Al-Zn-Mg-Cu Alloy: *Kaka Ma*¹; Tao Hu¹; Troy Topping¹; Ali Yousefiani²; Enrique Lavernia¹; Julie Schoenung¹; ¹University of California, Davis; ²Boeing Research & Technology

10:30 AM

Powder-route Synthesis and Mechanical Testing of an Ultrafine Grained W Alloy: *Zachary Cordero*¹; Emily Huskins²; Steven Livers³; Mansoo Park¹; Brian Schuster²; Megan Frary³; Christopher Schuh¹; ¹Massachusetts Institute of Technology; ²Army Research Laboratory; ³Boise State University

10:45 AM

Yielding Behavior and Its Effect on Uniform Elongation in IF Steel: *Si Gao*¹; Meichuan Chen¹; Mohit Joshi¹; Akinobu Shibata¹; Nobuhiro Tsuji¹; ¹Kyoto University

11:00 AM

Effect of Sample Volume on Microstructure Evolution during Severe Plastic Deformation: *Saurabh Basu*¹; M. Ravi Shankar¹; ¹University of Pittsburgh

11:15 AM

Reinforcement Size Dependence of Failure Mechanisms in Boron Carbide/Aluminum Matrix Composites: *Henry Yang*¹; Troy Topping¹; Lin Jiang¹; Enrique Lavernia¹; Julie Schoenung¹; ¹University of California Davis

11:30 AM

Deformation of Accumulative Roll Bonded Bulk Copper-Niobium Nanolaminates by Kink Band Formation: *Thomas Nizolek*¹; Irene Beyerlein²; Nathan Mara²; Tresa Pollock¹; ¹University of California Santa Barbara; ²Los Alamos National Laboratory

11:45 AM

Nanoscale Deformation Behavior of Phase-reversion Induced Austenitic Stainless Steels: The Interplay between Grain Size from Nano-grain Regime to Coarse-grain Regime

: *Venkata Sai Challa*¹; Pavan Challa Venkata Surya¹; Devesh Misra¹; Mahesh Somani²; Pentti Karjalainen²; ¹University of Louisiana at Lafayette; ²The University of Oulu

2014 Functional Nanomaterials: Synthesis, Properties and Applications — Characterization and Properties II & Carbon Nanomaterials I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Tuesday PM
February 18, 2014

Room: Ballroom D
Location: San Diego Marriott Marquis & Marina

Session Chairs: Nitin Chopra, The University of Alabama; Stephan Turano, Georgia Tech Research Institute; Jiyoung Kim, The University of Texas at Dallas

2:00 PM

Characterization of Cerium-based Nanomaterials for Photocatalytic Applications: *Carlos Castano*¹; Matthew O'Keefe¹; William Fahrenholtz¹; ¹Missouri University of Science and Technology

2:15 PM

Effect of Dealloying Temperature on Pore/Strut Size and Resulting Properties of Copper Foams: *Seungjin Nam*¹; Singon Kang¹; Donghyun Bae²; Hyunjoo Choi¹; ¹Kookmin University; ²Yonsei University

2:30 PM

Preparation and Ultraviolet-visible Absorption Property of AAO/Ni Composite Membranes: *Jiang Du*¹; *Zhengfu Zhang*¹; Hongying Hou¹; Jinhui Peng¹; Yongbiao Yang¹; ¹Kunming University of Science and Technology

2:45 PM Invited

Surface Plasmon Response in Bimetallic Nanoparticles: *Gerd Duscher*¹; ¹UTK

3:15 PM

The Effect of Nanotwins on the Thermal Stability and Corrosion Resistance of Cu: *Yifu Zhao*¹; Michael Kassner¹; Andrea Hodge¹; ¹University of Southern California

3:35 PM Break

3:55 PM

Fabrication and Characterization of Multilayer Nanoporous films: *Lei Wang*¹; *T. John Balk*¹; ¹University of Kentucky

4:15 PM Keynote

Graphene-like 2D-layered Materials for Nanoelectronics & Sensing Applications: *Anupama Kaul*¹; ¹National Science Foundation & JPL, Caltech

4:55 PM Invited

Functional Carbon Nanomaterial Heterostructures: *Mark Hersam*¹; ¹Northwestern University

5:25 PM

Metal-free Nitrogen Doped Microwave-exfoliated Graphene Nanosheets(N-MEG) as Effective Counter Electrode for Dye Sensitized Solar Cells: *Zhai Peng*¹; Chang Ya-Huei¹; Huang Yu-Ting¹; Feng Shien-Ping¹; ¹The University of Hong Kong

2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications — Nanometals I-Twinning and Interfacial Effects for Application

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Ramki Kalyanaraman, University of Tennessee; Haiyan Wang, Texas A&M University; Yuntian Zhu, North Carolina State University; Justin Schwartz, North Carolina State University; Amit Goyal, Oak Ridge National Laboratories

Tuesday PM
February 18, 2014

Room: Ballroom E
Location: San Diego Marriott Marquis & Marina

Session Chairs: Xiaozhou Liao, University of Sydney; G. Sundararajan, ARCI

2:00 PM Invited

Radiation Damage Tolerant Nanomaterials: Amit Misra¹; ¹Los Alamos National Laboratory

2:20 PM Invited

Consequences of Neutron Irradiation on ECAP Steel: Ahmad Alsabbagh¹; Ruslan Valiev²; K.L. Murty¹; ¹North Carolina State University; ²Ufa State Aviation Technical University

2:40 PM Invited

Laser-accelerated thin foil impact experiments for studies of intermetallic reactions in Nanolayered Ni+Al foils: Sean Kelly¹; Naresh Thadhani¹; ¹Georgia Institute of Technology

3:00 PM

The Surface Energy of the Al-Cu-Fe Quasicrystal: Jean-Marie Dubois¹; ¹Institut Jean Lamour

3:20 PM Break

3:40 PM Invited

Atomic-scale Understanding of Deformation Twins in Hexagonal-close-packed Metals: Jian Wang¹; Carlos Tome¹; Irene Beyerlein¹; John Hirth¹; ¹Los Alamos National Laboratory

4:00 PM Invited

Deformation Twinning and De-twinning in Nanostructured Materials: Xiaozhou Liao¹; ¹The University of Sydney

4:20 PM Invited

Switchable Deformation Mechanism in Columnar-grained Nanotwinned Metals: Zesheng You¹; Xiaoyan Li²; Ting Zhu³; Huajian Gao²; Lei Lu¹; ¹Institute of Metal Research, CAS; ²School of Engineering, Brown University; ³Woodruff School of Mechanical Engineering, Georgia Institute and Technology

4:40 PM Invited

Deformation Twinning in Nano-scale Cu Layers: Rodney McCabe¹; Irene Beyerlein¹; John Carpenter¹; Shijian Zheng¹; Nathan Mara¹; ¹Los Alamos National Laboratory

5:00 PM

Basic Criteria for Formation of Growth Twins in High Stacking Fault Energy Metals: Xinghang Zhang¹; Kaiyuan Yu; Daniel Bufford; Yue Liu; Youxing Chen; Haiyan Wang; ¹Texas A&M University

5:20 PM

The Influence of Stacking Fault Energy on the Formation of Highly Nanotwinned Cu-Al Alloys: Leonardo Velasco¹; Mikhail Polyakov¹; Andrea Hodge¹; ¹University of Southern California

5th International Symposium on High Temperature Metallurgical Processing — Roasting, Reduction and Smelting

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

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Mark Schlesinger, Missouri University of Science and Technology; Onuralp Yücel, ITU; Rafael Padilla, University of Concepcion; Phillip Mackey, P.J. Mackey Technology; Guifeng Zhou, Wuhan Iron and Steel

Tuesday PM
February 18, 2014

Room: 18
Location: San Diego Convention Center

Session Chairs: Mark Schlesinger, Missouri University of Science and Technology; Jianliang Zhang, University of Science and Technology Beijing

2:00 PM Introductory Comments

2:05 PM Invited

Analysis on the Reasons Attaching Slag to the Lining for Pillar and Walking-ridge in the Hot Rolling's Heating Furnaces: Guotao Xu¹; ¹Wuhan Iron and Steel Group Company

2:20 PM

A Study of Beneficiation of Siderite by Direct Reduction-magnetic Separation Process: Deqing Zhu¹; Yanhong Luo¹; Jian Pan¹; ¹Central South University

2:35 PM

Development and Industrial Application of an Improved Lead Oxygen-enriched Flash Smelting Process: Chengyan Wang¹; Wei Gao¹; Weijiao Yang¹; Fei Yin¹; Baozhong Ma¹; ¹Beijing General Research Institute of Mining and Metallurgy

2:50 PM

Effects of Reducer and Slag Concentrations in the Iron-carbon Nuggets Coalescence in Self Reducing Processes: Alberto Eloy Nogueira¹; Adolfo Pillihuaman Zambrano²; Cyro Takano¹; Marcelo Breda Mourão¹; ¹Universidade de São Paulo; ²Universidad Pontificia del Peru

3:05 PM

Industrial Experimental Study on Duplex Combined-blowing Converter Dephosphorization Process: Yan Zhanhui¹; Xing Xiangdong¹; Jianliang Zhang¹; Changliang Zhao¹; Pei Pei¹; Jiating Rao¹; ¹University of Science and Technology of Beijing

3:20 PM Break

3:30 PM

Roasting Characteristics of Oxidized Pellets of Vanadium-titanium Magnetite Concentrates: Xuling Chen¹; Yunsong Huang¹; Min Gan¹; Xiaohui Fan¹; Lishun Yuan¹; Wei Lv¹; ¹Central South University

3:45 PM

Thermodynamic Computation and Analysis for the Carbothermic Reduction of TiO₂: Liangying Wen¹; Jiajia Tu¹; Long Wang¹; Guibao Qiu¹; Chengguang Bai¹; ¹Chongqing University

4:00 PM

Kinetic Analysis of the Smelting Reduction of V₂O₅ in Blast Furnace Slag by Dissolved Carbon in Liquid Iron: Xiao-Yi Zeng¹; Yu Wang¹; Jia-Rong Yan¹; Hong-Yi Li¹; Bing Xie¹; ¹Chongqing University

4:15 PM

The Distribution of Boron between CaO-SiO₂-MgO-Al₂O₃-TiO₂ and Liquid Fe by Chemical Equilibrium Technique: Shan Ren¹; Jianliang Zhang¹; Xiaodong Ma²; Mao Chen²; Baojun Zhao²; ¹University of Science and Technology Beijing; ²The University of Queensland

4:30 PM

Thermal Test of Cast Iron Cooling Stave Produced by Lost Foam Casting Process: Fengguang Li¹; ¹University of Science and Technology Beijing



4:40 PM Invited

Study on Limonite Powder by Flash-magnetization Roasting: *Li Jialin*¹; Chen Wen¹; Liu Xiaoyin¹; ¹Changsha Research Institute of Mining & Metallurgy Co., Ltd

5:05 PM

Study on the Reduction Mechanism of Panzhihua (China) Ilmenite Activated by Ball Milling: *Lei Ying*¹; Li Yu¹; Peng Jinhui²; Zhang Libo²; ¹Anhui University of Technology; ²Kunming University of Science and Technology

4:50 PM

Simulation on Calciothermic Reduction Process of Titanium Dioxide: *Baoqiang Xu*¹; Jinyang Zhao²; Bin Yang¹; Xiuming Chen¹; Dongsheng Wang¹; Lingxin Kong¹; ¹National Engineering Laboratory for Vacuum Metallurgy, Key Laboratory of Nonferrous Metals Vacuum Metallurgy of Yunnan Province, Kunming University of Science and Technology; ²Faculty of Metallurgical and Energy Engineering, Kunming University of Science and Technology

A Lifetime of Experience with Titanium Alloys: An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer — Loretto Honorary Session II: Fatigue II & Advanced Fabrication

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Adam Pilchak, Air Force Research Laboratory; James Larsen, Air Force Research Laboratory; David Dye, Imperial College London; Jay Tiley, Air Force Research Laboratory

Tuesday PM Room: 1A
February 18, 2014 Location: San Diego Convention Center

Session Chairs: Hamish Fraser, The Ohio State University; Andy Woodfield, GE Aviation

2:00 PM Invited

30 Years' Experience in Titanium Alloys: *Andy Woodfield*¹; ¹GE Aviation

2:30 PM Invited

Effect of Macrozones and Alloy Chemistry on Strain Heterogeneity in Ti Alloys: *Michael Preuss*¹; David Lunt¹; Arnas Fitzner¹; Albert Smith¹; Joao Quinta da Fonseca¹; ¹University of Manchester

3:00 PM

Low Cycle and Dwell Sensitive Fatigue of Ordered Ti-6Al-4V: *Ananthi Sankaran*¹; Trevor Lindley¹; David Dye¹; ¹Imperial College

3:20 PM Invited

On Ti Powder Processing for Structural Components: *Xinhua Wu*¹; ¹Monash University

3:40 PM Break

4:00 PM

An Effective Method for Determining Single Crystal Material Parameters in Titanium Alloys: *Euan Wielewski*¹; Donald Boyce¹; Matthew Miller¹; Paul Dawson¹; ¹Cornell University

4:20 PM

In Situ Synthesis and Characterization of TiB₂ and Ti-Al-B Composites: *Muralidhran Ramachandran*¹; Ramana Reddy¹; ¹The University of Alabama

4:40 PM

Analysis of Microstructural Inhomogeneities of Ti-based Alloys Produced Via Laser-based Combinatorial Synthesis: Shichao Liu¹; Sheng Li¹; Nicholas Adkins¹; *Moataz Attallah*¹; ¹University of Birmingham

5:00 PM

Laser Assisted Cold Spray of Ti-6Al-4V: A Process Optimization Roadmap: *Aaron Birt*¹; Victor Champagne²; Diran Apelian¹; Richard Sisson¹; ¹Worcester Polytechnic Institute; ²Army Research Laboratory

5:20 PM

Synthesis and Behavior of Nano-structured TiNbTaZr Alloys via Mechanical Alloying and Spark Plasma Sintering: *Yitian Wang*¹; Baolong

Zheng¹; Troy Topping¹; Yizhang Zhou¹; Ruslan Valiev²; Enrique Lavernia¹; ¹University of California - Davis; ²Ufa State Aviation Technical University

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling — In-situ TEM and Materials Testing

Environmental Interactions and Programmatic Aspects

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

Program Organizers: Peter Hosemann, University of California Berkeley; Julie Tucker, Knolls Atomic Power Laboratory; James Cole, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Tuesday PM Room: 33B
February 18, 2014 Location: San Diego Convention Center

Session Chair: Todd Allen, Idaho National Laboratory

2:00 PM

Use of In-situ TEM to Study the Response of Metallic Systems Under Ion-beam Irradiation: *Djamel Kaoui*¹; ¹The University of South Carolina

2:40 PM

Irradiation Damage Development in Zirconium Carbide: *Christopher Ulmer*¹; Arthur Motta¹; Mark Kirk²; ¹Pennsylvania State University; ²Argonne National Laboratory

3:00 PM

In Situ SEM Characterization of Irradiated Stainless Steel: *Amanda Lupinacci*¹; Zhijie Jiao²; Peter Chou³; Andrew Minor¹; Peter Hosemann¹; ¹UC Berkeley; ²University of Michigan; ³EPRI

3:20 PM

Radiation-induced Microstructure in Metallic Nanopillars: *Eduardo Bringa*¹; Emilio Figueroa²; Gonzalo Gutierrez²; Sergio Davis²; Alfredo Caro³; ¹CONICET- Universidad Nacional de Cuyo; ²Universidad de Chile; ³Los Alamos National Laboratory

3:40 PM Break

4:00 PM

Ion Irradiation Effects on Model FE-CR Alloys: *Estelle Meslin*¹; Arunodaya Bhattacharya²; Jean Henry¹; Brigitte Décamps³; Cristelle Pareige³; ¹CEA; ²CEA/CNRS; ³CNRS

4:20 PM

Evolution of the ATR NSUF in Supporting Nuclear Fuels and Materials R&D: *James Cole*¹; Frances Marshall¹; John Jackson¹; Todd Allen¹; ¹Idaho National Laboratory

4:40 PM

Corrosion and Hydrogen Pickup of Zircaloy-4 in Simulated PWR Environments with In-situ Proton Irradiation: *Peng Wang*¹; Gary Was¹; Zhijie Jiao¹; ¹University of Michigan

5:00 PM

Corrosion of 316L Stainless Steel in Simulated PWR Conditions with In-situ Proton Irradiation: *Stephen Raiman*¹; Peng Wang¹; Gary Was¹; ¹University of Michigan

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Advanced Materials and HCP Metals

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Materials Characterization Committee, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Khalid Hattar, Sandia National Laboratories; Marko Knezevic, University of New Hampshire; Irene Beyerlein, Los Alamos National Laboratory

Tuesday PM
February 18, 2014

Room: 8
Location: San Diego Convention Center

Session Chairs: Rodney McCabe, Los Alamos National Laboratory; Marko Knezevic, University of New Hampshire

2:00 PM Invited

Local Stress and Strain Measurement Methodologies for In Situ TEM Probing Experiments: *Andrew Minor*¹; ¹UC Berkeley & LBL

2:30 PM

Counting Dislocations in Micro-crystals with Coherent X-rays: Ex-situ and In-situ Studies of the Plastic Deformation of InSb Micro-pillars: Vincent L.R. Jacques¹; Geradina Carbone²; Rudy Ghisleni³; *Ludovic Thilly*⁴; ¹Laboratoire de Physique des Solides; ²ESRF; ³EMPA; ⁴University of Poitiers

2:50 PM

In Situ HRTEM Observation on Discrete Dislocation Plasticity in 10 nm Nanowires: *Scott Mao*¹; He Zheng¹; C. Weinberger²; Jianyu Huang; ¹University of Pittsburgh; ²Sandia National Laboratories

3:10 PM Invited

In Situ Deformation Transmission Electron Microscopy Investigation of the Mechanical Behavior of GaAs Nanowires: *Xiaozhou Liao*¹; ¹The University of Sydney

3:40 PM Break

4:00 PM Invited

Development of Single-shot Polychromatic Micro X-ray Diffraction for In-situ Observation of Yielding in MgAZ₃₁: *Peter Lynch*¹; Matthew Barnett¹; ¹Deakin University

4:30 PM

Micromechanical Deformation Behaviour of Hydride-containing Micropillars in Zircaloy-4: *Hannah Weekes*¹; David Dye¹; TB Britton¹; Finn Giuliani¹; ¹Imperial College London

4:50 PM

Microstructural Characterization of Pure Rhenium under Compressive Loads: *Josh Kacher*¹; J Morris¹; Andrew Minor¹; ¹University of California, Berkeley

5:10 PM

In Situ Characterization of Twin Nucleation Using 3D-XRD in Pure Ti: *Harsha Phukan*¹; Leyun Wang²; Chen Zhang¹; Thomas Bieler¹; Armand Beaudoin³; Jun-Sang Park²; ¹Michigan State University; ²Argonne National Laboratory; ³University of Illinois UrbanaChampaign

Advanced Composites for Aerospace, Marine, and Land Applications — Interface and Bonding of Composite Systems

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

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

Tuesday PM
February 18, 2014

Room: 6F
Location: San Diego Convention Center

Session Chairs: Tomoko Sano, US Army Research Laboratory; Brandon McWilliams, US Army Research Laboratory

2:00 PM Invited

Multi-scale Modeling of Continuous Ceramic Fiber Reinforced Aluminum Matrix Composites: *Brandon McWilliams*¹; Chian-Fong Yen¹; ¹US Army Research Laboratory

2:20 PM

Development of Percussion Diagnostics in Evaluating ‘Kiss’ Bonds between Composite Laminates: *Scott Poveromo*¹; James Earthman¹; ¹UC Irvine

2:40 PM

Enhanced Mechanical Performance of Woven Composite Laminates Using Plasma Treated Polymeric Fabrics: Timothy Walter¹; *Andres Bujanda*¹; Victor Rodriguez-Santiago¹; Jacqueline Yim¹; Jose Baeza²; Daphne Pappas³; ¹U.S. Army Research Laboratory; ²NAVAIR; ³EP Technologies LLC

3:00 PM

Adhesively Bonded Composite Joints: An Investigation of Contamination Effects on Durability: *Vishal Musaramthota*¹; Dwayne McDaniel²; Tomas Pribanic²; Norman Munroe¹; Xiangyang Zhou³; ¹Florida International University; ²Applied Research Centre; ³University of Miami

3:20 PM

New Hybrid Molding Processes for Good Adhesion and Increased Functions of Metal/Plastic Composite Parts: *Gabriel Schenke*¹; Uwe Vroomen¹; Andreas Bührig-Polaczek¹; ¹RWTH Aachen

3:40 PM Break

4:00 PM

Forming Limit Diagram of Steel/Polymer/Steel Sandwich Systems for the Automotive Industry: *Mohamed Harhash*¹; Heinz Palkowski¹; ¹TU Clausthal

4:20 PM

Optimization of Process Parameter of Diffusing Bonding of Titanium with Titanium and Titanium with Copper: *Chandrappa Kasigavi*¹; ¹Siddaganga Institute Of Technology

4:40 PM Invited

The Wettability of TiCx by Ti-Al Alloys at 1758 K: *Xuyang Liu*¹; Xuewei Lv¹; Chenguang Bai¹; Chunxin Li¹; ¹Chongqing University



Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion II — Wide Bandgap Semiconductors Device Processing and Characterization

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee, TMS: Magnetic Materials Committee
Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael McHenry, Carnegie Mellon University; Matthew Willard, Case Western Reserve University; Rachael Myers-Ward, NRL; Mike Lanagan, Penn State University; Clive Randall, Penn State University

Tuesday PM Room: Cardiff
February 18, 2014 Location: San Diego Marriott Marquis & Marina

Session Chair: Rachael Myers-Ward, Naval Research Laboratory

2:00 PM Invited

High Performance Wide Bandgap Power Electronics: *Ty McNutt*¹; ¹APEI, Inc.

2:30 PM Invited

SiC Power Devices and Applications: *Bruce Odekirk*¹; ¹Microsemi

3:00 PM Invited

Thermal Management Challenges in GaN Electronics: Characterization and Optimized Heat Extraction: *Martin Kuball*¹; ¹University of Bristol

3:30 PM Break

3:50 PM Invited

Reliability of GaN HEMTs: Electrical and Radiation-induced Failure Mechanisms: *Travis Anderson*¹; A. Koehler¹; Karl Hobart; B. Weaver¹; P. Specht²; M. Porter³; T. Weatherford³; F. Kub¹; ¹Naval Research Laboratory; ²University of California, Berkeley; ³Naval Postgraduate School

4:20 PM Invited

Plasma Enhanced ALD of High-k Dielectrics on GaN and AlGaN: *Brianna Eller*¹; Jialing Yang¹; Robert Nemanich¹; ¹Arizona State University

4:50 PM Invited

Dielectric Breakdown: Theory, Characterization and Its Relationship to Energy and Power Density: *Mike Lanagan*¹; ¹Penn State University

Advanced Materials in Dental and Orthopedic Applications — Physical and Mechanical Properties of Orthopedic/Dental Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Hanson Fong, University of Washington; Mathew Mathew, Rush University Medical Center; Cortino Sukotjo, University of Illinois at Chicago

Tuesday PM Room: 33A
February 18, 2014 Location: San Diego Convention Center

Session Chairs: Tolou Shokuhfar, Michigan Tech; Terry Lowe, Manhattan Scientifics Inc. Company

2:00 PM Invited

Temporomandibular Joint Replacement - Past, Present and Future Material Considerations: *Louis Mercuri*¹; ¹Rush Orthopedics

2:20 PM

Difference of Wear Behavior Between Ti-29Nb-13Ta-4.6Zr Alloy and Ti-6Al-4V ELI Alloy for Biomedical Applications: *Masaaki Nakai*¹; Mitsuo Niinomi¹; Junko Hieda¹; Ken Cho¹; Yoon-Seok Lee¹; ¹Tohoku University

2:35 PM

Mechanical Performance of Different Nickel-titanium Archwires Used in Dentistry: *Daniel Fernandes*¹; Carlos Elias²; Rafael Peres²; ¹University of California, San Diego; ²Military Institute of Engineering

2:50 PM Invited

Novel Synthesis and Characterization of Advanced Materials for Prosthodontics and Orthopedics: *Christos Takoudis*¹; ¹University of Illinois - Chicago

3:20 PM

Effects of Pre and Post-sintering Treatments on the Mechanical Behaviour of a Y-TZP Ceramic for Prosthodontics: *Sheila Pestana Passos*¹; Paul Major¹; Bernard Linke¹; *John Nychka*¹; ¹University of Alberta

3:35 PM Break

3:55 PM

Nanoscale Phase Decomposition and Mechanical Properties of Biomedical Co-Cr-Mo Alloys with Nitrogen Addition: *Kenta Yamanaka*¹; Manami Mori²; Akihiko Chiba¹; ¹Tohoku University; ²NISSAN ARC, LTD.

4:10 PM

Scandium as Alloying Addition to Magnesium to Improve the Properties of Biodegradable Implant Materials: *Ida Berglund*¹; Harpreet Brar¹; Josephine Allen¹; Michele Manuel¹; ¹University of Florida

4:25 PM

Cross-comparison of Rate Dependent Strength of Biocompatible Ti Alloys: *Alan Jankowski*¹; Zach Grubbs¹; ¹Texas Tech University

4:40 PM

Mechanical Properties and Biological Evaluation of Ti-39Nb-6Zr Alloy: *Dong-Geun Lee*¹; Ka-Ram Lim¹; Yong-tai Lee¹; ¹Korea Institute of Materials Science

4:55 PM

The Effect of Iron, Silicon and Oxygen on Mechanical Properties of Ti-Nb-Zr-Ta Biomedical Alloy: *Josef Stráský*¹; Milos Janecek¹; Petr Hrcuba¹; Michal Landa²; ¹Charles University; ²Czech Academy of Sciences

Advances in Surface Engineering: Alloyed and Composite Coatings III — Electrochemical and Low Temperature Processing of Coatings

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
Program Organizers: Sandip Harimkar, Oklahoma State University; Jeff De Hosson, Univ of Groningen; Roger Narayan, University of North Carolina and North Carolina State University; Efstathios (Stathis) Meletis, University of Texas at Arlington; Virendra Singh, Schlumberger Rosharon Campus; Srinivasa Bakshi, Indian Institute of Technology-Madras; Mathieu Brochu, McGill University; Arvind Agarwal, Florida International University; Jian Luo, UC San Diego; Nancy Michael, University of Texas at Arlington; Nugehalli Ravindra, New Jersey Institute of Technology; Adele Carradó, IPCMS; Choong-un Kim, University of Texas at Arlington; Amit Pandey, Rolls Royce LG Fuel Cell

Tuesday PM Room: 1B
February 18, 2014 Location: San Diego Convention Center

Session Chairs: Virendra Singh, Schlumberger Rosharon Campus; Sandip Harimkar, Oklahoma State University

2:00 PM Invited

Structure-property-performance Correlations in the Micro Arc Oxidation Coatings Deposited on 6061 T6 Al alloy: *G Sundararajan*¹; L Ramakrishna¹; ¹ARCI

2:20 PM

The Effects of P Content in Nanostructured Electrolytic Co-P Coatings: *Sriram Vijayan*¹; John Carpenter²; Amit Datta²; Mark Aindow¹; ¹University of Connecticut; ²US Chrome Corporation

2:35 PM

Electrodeposition of Ni-Al-Cr Bond Coat and Its High Temperature Behavior on Gamma-TiAl: *Kai Tan*¹; Viola Accoff¹; ¹The University of Alabama

2:50 PM

Silicizing of Fe by Electrochemical Reduction of Si from Molten Silicates: *Hideaki Sasaki*¹; Masafumi Maeda¹; ¹Institute of Industrial Science,

3:05 PM

Al-Si-Fe Coatings on 6061 Aluminium Alloy Using Cold Metal Transfer Technique: Rajeev GP¹; M Kamaraj¹; *Srinivasa Bakshi*¹; ¹Indian Institute of Technology Madras

3:20 PM

Microstructure-processing-microstructure Relationships in Cold Spray Deposited Stainless Steel Coatings: *Luke Brewer*¹; Jonathan Schiel¹; Sarah Menon¹; ¹Naval Postgraduate School

3:35 PM

Effect of Temperature on Wear and Corrosion Properties of Electroless Nickel (Ni-P) Coatings on AISI 1040 steel: *Nanjunda Velu*¹; Balaji V P²; Shanmugam Subramaniam²; ¹National Institute of Technology, Karnataka Suratkal; ²WABCO

3:50 PM Break

4:00 PM

Study on Corrosion Behavior of Plasma Electrolytic Oxidation (PEO) Coated Friction Stir Welded AA 2024 Weldments: *Jerome Savarimuthu*¹; Kasimala Suneel¹; Kumaresh Babu¹; ¹NIT, Tiruchirappalli,

4:15 PM

Properties of Electrodeposited Ni-Bi Composite Coatings by an Ionic Co-discharge Deposition: *See Tay*¹; Caizhen Yao¹; Weiwei Chen²; Wei Gao¹; ¹The University of Auckland; ²Beijing Institute of Technology

4:30 PM

Effect of Voltage Pulse Duration on Surface Properties of Micro Arc Oxidized AZ91 Mg Alloy: Mert Altay¹; Namik Gozuacik¹; *Murat Baydogan*¹; ¹Istanbul Technical University

4:45 PM

Effects of Electroplating Parameters on the Composition and Morphology of Ag-Cu Deposits: *Fulya Ulu*¹; Ishak Karakaya¹; Gökhan Demirci²; Mustafa Aras¹; Metehan Erdogan³; ¹Middle East Technical University; ²Aselsan Inc.; ³Yildirim Beyazıt University

5:00 PM

Study on Preparation of Al by Electrodeposition: *Hongmin Kan*¹; Ning Zhang¹; Xiaoyang Wang¹; Haibo Long¹; ¹Shenyang University

5:15 PM

Properties of Ceramic Reinforced Copper Matrix Composite Coatings Produced by Cold Gas Dynamic Spraying Technique: Onur Tazegul¹; Gorkem Yumusak¹; *Cagdas Calli*¹; Onur Meydanoglu¹; E. Sabri Kayali¹; ¹Istanbul Technical University

5:30 PM

Comparison of Stellite Coatings on Valve Steel Material Prepared by Plasma Transferred Arc and Cold Metal Transfer Techniques: Rajeev GP¹; Kamaraj M¹; *Srinivasa Bakshi*¹; ¹Indian Institute of Technology Madras

Algorithm Development in Computational Materials Science and Engineering — Towards Higher Length Scales: Mesoscale Modeling and Scale Bridging: Part II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee

Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas; Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, Army Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology

Tuesday PM
February 18, 2014

Room: 31B
Location: San Diego Convention Center

Session Chairs: Mohsen Asle Zaeem, Missouri University of Science and Technology; Dongsheng Li, Pacific Northwest National Laboratory

2:00 PM Invited

Mapping the Stochastic Response of Nanostructures: *Ellad Tadmor*¹; Ryan Elliott¹; Subrahmanyam Pattamatta¹; ¹University of Minnesota

2:40 PM

About the Effect of the Simulation Temperature in the Monte Carlo Potts Model on Grain Growth: *Dana Zoellner*¹; ¹Otto von Guericke University Magdeburg

3:00 PM

Adaptive Multiple Super Fast Simulated Annealing for Stochastic Microstructure Reconstruction: *Dongsheng Li*¹; Guang Lin¹; ¹Pacific Northwest National Laboratory

3:20 PM

An Innovative 3-D Stochastic Model for Prediction of Dendritic Microstructure of Solidifying Alloys: Daojie Zhang¹; *Laurentiu Nastac*¹; ¹The University of Alabama

3:40 PM Break

4:00 PM

Phase Field Crystal Model for FCC Metals Connected to MEAM Molecular Dynamics Simulations: Ebrahim Asadi¹; *Mohsen Asle Zaeem*¹; ¹Missouri University of Science and Technology

4:20 PM

A Controlled Stress Energy Minimization Method for Coarse-grained Atomistic Simulation: *Shuozhi Xu*¹; Rui Che²; Liming Xiong²; David McDowell¹; Youping Chen²; ¹Georgia Tech; ²University of Florida

4:40 PM

A Multiscale Approach to Modeling Intergranular Fracture Process: *Benyamin Gholami Bazehhour*¹; Ilaksh Adlakha¹; Kiran Solanki¹; Jay Oswald¹; ¹Arizona State University

5:00 PM

Order Parameter Re-mapping Algorithm for 3D Phase Field Modeling of Grain Growth Coupled to Mechanics Using FEM: *Cody Permann*¹; Michael Tonks¹; ¹INL



Alumina and Bauxite — Cost Reduction/Alumina Recovery

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Ian Duncan, Hatch Ltd

Tuesday PM Room: 15B
February 18, 2014 Location: San Diego Convention Center

Session Chair: Roberto Seno, Votorantim Metais/CBA

2:00 PM Introductory Comments

2:05 PM

A Review of Two Phase Flow Modeling and Its Applicability to the Bayer Process: Alessio Scarsella¹; Alessio Scarsella¹; Hans-Werner Schmidt¹; Outotec GmbH

2:30 PM

Pipeline Scaling Prevention and Removal Methods in Bayer Digestion Process: Cao Wenzhong¹; Li Haining¹; Tian Weiwei¹; Zhong Hong¹; Nanchang University

2:55 PM

Using of Silicate-type Polymers as Inhibitor of Scaling at Aluminate Liquors Heating and Evaporation: Vladimir Kazakov¹; Vadim Lipin²; St. Petersburg State Technologic University of Plant Polymers; Saint Petersburg State Polytechnical University

3:20 PM Break Session

3:35 PM Introductory Comments

3:40 PM

Crystal Structure and Alumina Leaching Property of Na₂O Doped C₁₂A₇: Bo Wang¹; Shufeng Zong¹; Jianxin Zhang¹; Huilan Sun¹; Yubing Zhang¹; Dongdong Liu¹; Jijia Liu¹; Hebei University of Science and Technology

4:00 PM

Decomposition property of γ -2CaO·SiO₂ during leaching process of calcium aluminate slag: Sun Huilan¹; Bo Wang¹; Jianxin Zhang¹; Shufeng Zong¹; Hebei University of Science and Technology

4:20 PM

Effect of Calcium/Aluminium Ratio on Crystal Structure and Al₂O₃ Leaching Property of 12CaO·7Al₂O₃ by Sol-gel Method: Bo Wang¹; Jianxin Zhang²; Shufeng Zong²; Huilan Sun²; Northeastern University; Hebei University of Science and Technology

4:40 PM

Multi-steps Carbonation Treatment of Calcified Slag of Red Mud: Lv Guozhi¹; Zhang Ting'an¹; Zhu Xiaofeng¹; Guo Fangfang¹; Pan Lu¹; Liu Yan¹; Zhao Qiuyue¹; Li Yan¹; Jiang Xiaoli¹; He Jicheng¹; Northeastern University

Aluminum Alloys: Development, Characterization and Applications — Solutioning and Aging Behaviors

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Xiyu Wen, University of Kentucky

Tuesday PM Room: 12
February 18, 2014 Location: San Diego Convention Center

Session Chair: Subodh Das, Phinix, LLC

2:00 PM

A Study of Precipitation Sequence and Formation Mechanism of High Temperature Second Phases in a Modified 6xxx Al Alloy: Gongwang Zhang¹; Yi Han²; Hiromi Nagaumi²; Gang Sha³; Chad Parish⁴; Tongguang Zhai¹; University of Kentucky; Suzhou Research Institute for Nonferrous Metals; The University of Sydney; Oak Ridge National Laboratory

2:20 PM

Precipitates in Long Term Aging Al 5083 Alloy: Gaosong Yi¹; University of Utah

2:40 PM

Effect of Modified Aging Treatments on the Tensile Properties, Quality Indices and Fatigue Life of Cast Components of Aluminum Alloy 354: Dinesh Babu¹; Nagewara Rao Mukinutalapati²; Lap-Ross Engineering Limited, Banavaram Post, Pulivalam Village, Vellore District, Tamilnadu, India; VIT University, Vellore

3:00 PM

Effect of Mn and Cr Additions on the Precipitation Behavior of Dispersoids in Al-Mg-Si-Cu Alloy during Homogenization Annealing: Shijie Guo¹; Yi Han¹; Liang Chen²; Tongguang Zhai²; Hiromi Nagaumi¹; Suzhou Research Institute for Nonferrous Metals; University of Kentucky

3:20 PM Break

3:35 PM

Effect of Vanadium Addition on the Structure of Aluminum (Al99,5) and 6xxx Aluminum Alloys: Sonia Boczkal¹; Marzena Lech - Grega¹; Jerzy Morgiel²; Krzysztof Piela³; Institute of Non-Ferrous Metals in Gliwice; Institute of Metallurgy and Materials Science of Polish Academy of Sciences; AGH University of Science and Technology

3:55 PM

Aluminum Tailor-welded Blanks for High Volume Automotive Applications: Yuri Hovanski¹; Piyush Upadhyay¹; Siva Pilli¹; Blair Carlson²; John Carsley²; Susan Hartfield-Wunsch²; Mark Eisenmenger³; Pacific Northwest National Laboratory; General Motors; TWB Inc.

4:15 PM

High Temperature Creep Characterization of A₃₈₀ Cast Aluminum Alloy: Dimitry Sediako¹; Mike Walker²; Wojciech Kasprzak³; Frank Czerwinski³; Atomic Energy of Canada Limited; General Motors Corporation; CanmetMATERIALS

4:35 PM

Role of Ni and Zr in Preserving the Strength of 354 Aluminum Alloy at High Temperature: G.H. Garza-Elizondo¹; Saleh Ali M Alkahtani; A.M. Samuel¹; Fawzy Samuel¹; UQAC

4:55 PM

A Study of the Artificial Ageing on the Low Temperature Creep of AlMgSi (AA6201) Wires: Beata Smyrak¹; Tadeusz Knych¹; Andrzej Mamala¹; Kinga Korzen¹; AGH - University of Science and Technology

5:15 PM

Numerical Simulation and Experimental Characterization of Friction Stir Welding on Thick Aluminum Alloy AA₂₁₃₉-T₈ Plates: Jian Yu¹; Brandon McWilliams¹; Chian-Fong Yen¹; US Army Research Laboratory

Aluminum Reduction Technology — Environment I

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Margaret Hyland, University of Auckland

Tuesday PM Room: 13
February 18, 2014 Location: San Diego Convention Center

Session Chair: Stephan Broek, Hatch Ltd

2:00 PM Introductory Comments

2:05 PM

Comparing Different Measurement Approaches to Characterize All PFC Emissions: Simon Gaboury¹; Patrice Tremblay¹; Anne Gosselin¹; Jerry Marks²; Rio Tinto Alcan; J Marks & Associates LLC

2:30 PM

Anode Effect Phenomena during Conventional AEs, Low Voltage Propagating AEs & Non-propagating AEs: David S. Wong¹; Alton Tabereaux²; Pascal Lavoie¹; The University of Auckland; Consultant

2:55 PM

Monitoring of Continuous PFC Formation in Small to Moderate Size Aluminium Electrolysis Cells: *Henrik Åsheim*¹; Thor Anders Aarhaug²; Alain Ferber²; Ole Kjos²; Geir Martin Haarberg¹; ¹NTNU; ²SINTEF

3:20 PM

At-line Analysis of Polycyclic Aromatic Hydrocarbons in Aluminium Primary Production: Ole Kjos¹; Thor Anders Aarhaug¹; Bernd Wittgens¹; Anders Brunsvik¹; ¹SINTEF

3:45 PM Break

4:00 PM

Raw Gas Particles and Depositions in Fume Treatment Facilities in Aluminum Smelting: *Heiko Gaertner*¹; Arne Petter Ratvik²; Thor Anders Aarhaug²; ¹NTNU; ²SINTEF

4:25 PM

The Nature of Particles and Fines in Potroom Dust: *David Wong*¹; Nursiani Tjahyono¹; Margaret Hyland¹; ¹University of Auckland

4:50 PM

Predictive Tools in Evaluating Re-entrainment of Exhausted Particulate in Different Ventilator Configurations for Different Heat Process Applications: *Edmund Baltuch*¹; ¹Air-Therm Inc.

5:15 PM

Economic and Environmental Alternative for the Destination of Spent Pot Lining from Primary Aluminium Production: *Bruna Meirelles*¹; Henrique Santos¹; ¹Votorantim Metais - CBA

Aluminium Reduction Technology — Fundamentals - Chemistry

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Margaret Hyland, University of Auckland

Tuesday PM

February 18, 2014

Room: 14A

Location: San Diego Convention Center

Session Chair: Gudrun Saevarsdottir, Reykjavik University

2:00 PM Introductory Comments

2:05 PM

Improving XRD Analysis for Complex Bath Chemistries – Investigations and Challenges Faced: *Nursiani Tjahyono*¹; Tania Groutso¹; David Wong¹; Pascal Lavoie¹; Mark P. Taylor¹; ¹Light Metals Research Centre

2:30 PM

Al₂O₃-Na₃AlF₆ Man-made Ledge Composites for Aluminum Electrolysis Cells: *Xiaojun Lv*¹; Chao Zhang¹; Yanqing Lai¹; Zhongliang Tian¹; Ming Jia¹; Jie Li¹; ¹Central South University School of Metallurgy and Environment

2:55 PM

Structural Characterisation and Thermophysical Properties of the Side Ledge in the Hall-Héroult Cells: *Sandor Poncsak*¹; Laszlo Kiss¹; Rémi St-Pierre¹; Sébastien Guérard²; Jean-François Bilodeau²; ¹University of Quebec at Chicoutimi; ²Rio Tinto Alcan, CRDA

3:20 PM

The Melting Behaviour of Aluminium Smelter Crust: *Qinsong Zhang*¹; Mark P Taylor²; John J.J. Chen²; ¹Shenyang Aluminium & Magnesium Engineering & Research Institute Co. Ltd; ²Light Metals Research Centre, The University of Auckland

3:45 PM Break

4:00 PM

Key Physical Properties of Smelter Grade Alumina: *Stephen Lindsay*¹; ¹Alcoa, Inc.

4:25 PM

Modeling the Behavior of Alumina Agglomerate in the Hall-Héroult Process: *Véronique Dassylva-Raymond*¹; Laszlo Kiss¹; Sandor Poncsak¹; Patrice Chartrand²; Jean-François Bilodeau³; ¹University of Quebec at Chicoutimi; ²École Polytechnique de Montréal; ³Rio-Tinto-Alcan

4:50 PM

Wetting Characteristics of Cryolite-based Melts on Spinel Substrate: Reiza Mukhlis¹; *Muhammad Akbar Rhamdhani*¹; Geoffrey Brooks¹; Kathie McGregor²; ¹Swinburne University of Technology; ²CSIRO Process Science and Engineering

Bulk Metallic Glasses XI — Fatigue and Other Properties

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

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Tuesday PM

February 18, 2014

Room: 2

Location: San Diego Convention Center

Session Chairs: Gongyao Wang, University of Tennessee; Jamie Kruzic, Oregon State University

2:00 PM Invited

Unique Characteristics of the Fracture and Fatigue Behavior of Bulk Metallic Glasses: *Jamie Kruzic*¹; Steven Naleway¹; Bernd Gludovatz²; Robert Ritchie²; ¹Oregon State University; ²Lawrence Berkeley National Laboratory

2:20 PM

Biocorrosion and Cytotoxicity Studies on Cu₆₀Zr₂₀Ti₂₀ Metallic Glass: *S. Vincent*¹; A. Daiwile²; S. S. Devi²; B. Murty³; Jatin Bhatt¹; ¹Visvesvaraya National Institute of Technology, Nagpur; ²National Environmental Engineering Research Institute, Nagpur; ³Indian Institute of Technology Madras

2:30 PM Invited

Formation of Oxide Layer with an Amorphous Structure in Metallic Glasses: Kang Cheol Kim¹; Sung Hyun Park¹; Min Young Na¹; Ka Ram Lim²; Won Tae Kim³; *Do Hyang Kim*¹; ¹Yonsei University; ²Korea Institute of Materials Science; ³Cheongju University

2:50 PM

Electrochemical Corrosion Behavior of Amorphous and Crystalline Zr-based Alloys in Simulated Body Fluid: *Ali Tabeshian*¹; Dan Persson²; Ragnhild Aune¹; Steven Savage³; ¹Norwegian University of Science and Technology; ²Swerea KIMAB AB; ³Swedish Defense Research Agency

3:00 PM Invited

Composition and Surface Tailoring of Zr-based Bulk Metallic Glasses: Implications for Bio-applications: *Wei He*¹; Lu Huang¹; Samuel Goddard¹; Elizabeth Fozo¹; Peter Liaw¹; ¹The University of Tennessee

3:20 PM

Corrosion and Cytotoxicity of a Ni-free Zr-Al-Fe-Cu Bulk Metallic Glass: *Lu Huang*¹; Wei Zhang²; Lance Garrett³; Samuel Goddard¹; Wei Wu¹; Peter Liaw¹; Wei He¹; ¹The University of Tennessee; ²Dalian University of Technology; ³South Dakota School of Mines and Technology

3:30 PM Break

3:50 PM Invited

Shear Band and Crack Microstructures of a Zr-based Bulk Metallic Glass in Fatigue Testing: *Pei-Ling Sun*¹; Gongyao Wang²; Peter Liaw²; ¹Feng Chia University; ²University of Tennessee

4:10 PM

Fatigue of Bulk Metallic Glasses and their Composites: *Gongyao Wang*¹; Y. Yokoyama²; Peter Liaw¹; ¹University of Tennessee; ²Collaborative Research and Development Center for Advanced Materials

4:20 PM Invited

Erosion Behavior of Bulk Metallic Glasses: *Sundeep Mukherjee*¹; ¹University of North Texas



4:40 PM

Dealloying and Corrosion Behavior of a Pd-Based Metallic Glass: *Yehan Zhang*¹; Simon Garrett¹; Robert Conner¹; ¹California State University, Northridge

4:50 PM Invited

Dynamic Hysteresis in Cyclic Deformation of Crystalline/Noncrystalline Solids: *Gong Li*¹; R.P Liu¹; Sibao Gao¹; P.K. Liaw¹; ¹University of Tennessee

5:10 PM

Bulk Metallic Glasses (BMG) and Conventional Surface Modified Biomaterials: A Comparative Tribocorrosion Study in Simulated Body Fluid: *Guohua Zhao*¹; Cristian Torres²; Nuria Espallargas³; Ragnhild Aune¹; ¹KTH Royal Institute of Technology; ²Universidad Politecnica de Valencia; ³Norwegian University of Science and Technology

5:20 PM Invited

Static and Dynamic Structure of Zr-based Bulk Metallic Glasses: Pei Zhang¹; Li He¹; Jinn Chu²; Yen-Chen Chen²; Chia-Lin Li²; Peter Liaw³; Matt Besser⁴; Matt Kramer⁴; *Paul Voyles*¹; ¹University of Wisconsin, Madison; ²National Taiwan University of Science and Technology; ³University of Tennessee, Knoxville; ⁴Ames Lab

Cast Shop for Aluminum Production — Grain Refinement/Solidification

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Edward Williams, Alcoa

Tuesday PM
February 18, 2014

Room: 15A
Location: San Diego Convention Center

Session Chair: Dmitry Eskin, Brunel University

2:00 PM Introductory Comments

2:05 PM

Grain Refinement of Aluminium Alloys: Recent Developments in Predicting the As-Cast Grain Size of Alloys Refined by Al-Ti-B Master Alloys: Mark Easton¹; Arvind Prasad²; *David StJohn*²; ¹RMIT University; ²University of Queensland

2:30 PM

A Comparison of the Effects of Al-Ti-B Type Grain Refiners from Different Makers on Pure Aluminum: *Wei Dai*¹; Xiaoming Wang¹; Weitao Zhao²; Qingyou Han¹; ¹Purdue University; ²Sitong New Metal Limited Company

2:55 PM

Improved Grain Refinement of AA₆₀₆₀ Extrusion Billets: *John Courtenay*¹; Isabell Klauke²; Rein Vainik¹; Giuseppe Esposito²; Marcel Rosefort²; ¹MQP Limited; ²Trimet Aluminium SE

3:20 PM

On the Performance of a Novel Grain Refiner in Hyper-eutectic Al-Si Cast Alloys: *Leandro Bolzoni*¹; Magdalena Nowak¹; Hari Babu Nadendla¹; ¹Brunel University

3:45 PM Break

4:00 PM

Analysis of Boron Treatment for V Removal using AlB₂ and AlB₁₂ based Master Alloys: Abdul Khaliq¹; *Muhammad Akbar Rhamdhani*¹; Geoffrey Brooks¹; John Grandfield²; ¹Swinburne University of Technology; ²Grandfield Technology Pty Ltd

4:25 PM

The Effect of Trace Levels of Ni and V on Properties of Four Common Aluminium Alloys: *John Grandfield*¹; Lisa Sweet²; Aiden Beer³; Su-Ming Zhu²; Xiaobo Chen²; Mark Easton²; ¹Grandfield Technology Pty Ltd; ²Monash University; ³Deakin University

4:50 PM

Evaluation of Functional Properties of the Rapidly Solidified Cast AlSi30 Alloy as a Material for Transport Applications: *Boguslaw Augustyn*¹; Marcin Szymanek¹; Dawid Kapinos¹; Marek Nowak¹; Wojciech Pakielna²; ¹Institute of Non Ferrous Metals; ²Silesian University of Technology

5:15 PM

The Near-rapid Solidification Behavior of AA₁₀₇₀ Aluminum Alloy: *Yulin Liu*¹; Li Zhang¹; Yuhua Zhao¹; Jijie Wang¹; Chunzhong Liu¹; ¹Shenyang Aerospace University

Celebrating the Megascale: An EPD Symposium in Honor of David G.C. Robertson — Iron and Steel Production

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, W A School of Mines; Geoffrey Brooks, Swinburne University of Technology

Tuesday PM
February 18, 2014

Room: 16A
Location: San Diego Convention Center

Session Chairs: Roderick Guthrie, McGill University; Gordon Irons, McMaster University

2:00 PM Introductory Comments

2:05 PM Invited

Sustainability in Ironmaking: The Rise of Direct Reduction: *Thomas Battle*¹; ¹Midrex Technologies

2:25 PM Invited

Ferroalloy Induced Precipitates in Continuously Cast Microalloyed Steels: Syed Shah¹; *Hani Henein*¹; Douglas Ivey¹; ¹Department of Chemical and Materials Engineering, University of Alberta

2:45 PM Invited

Kinetics of Reaction Important in Oxygen Steelmaking: *Kenneth Coley*¹; ¹McMaster University

3:05 PM Invited

Current Status and Future Direction of Low-emission Integrated Steelmaking Process: *Sharif Jahanshahi*¹; Alex Deev¹; Nawshad Haque¹; Liming Lu¹; John Mathieson¹; Terry Norgate¹; Yuhua Pan¹; Philip Ridgeway²; Harold Rogers³; Michael Somerville¹; Dongsheng Xie¹; Paul Zulli³; ¹CSIRO; ²Arrium; ³BlueScope Steel

3:25 PM Invited

Analysis of Steelmaking Reactions by Coupled Reaction Model: *Shinya Kitamura*¹; ¹Tohoku University

3:45 PM Break

4:05 PM Invited

Cold Modelling of Splashing Phenomena in Oxygen Steelmaking: Shabnam Sabah¹; *Geoffrey Brooks*¹; ¹Swinburne University of Technology

4:25 PM

Lean Operations Strategy to Combat Uncertainties in Temperature at BOF Endpoint, Tapping, Deoxidation, Alloy Addition and Thermal History: Ishani Shukla¹; G Rajesh²; *Ajay Shukla*³; Deepu Philip¹; ¹Indian Institute of Technology, Kanpur; ²Visakhapatnam Steel Plant; ³Indian Institute of Technology, IIT Madras

4:45 PM Invited

Ladle Metallurgy Kinetics: Inclusion-inclusion Reactions: *P. Chris Pistorius*¹; ¹Carnegie Mellon University

5:05 PM

Valorization of Electrical Arc Furnace Oxidizing Slag: *Joonho Lee*¹; ¹Korea University

Characterization of Minerals, Metals and Materials 2014 — Characterization of Non Ferrous Metals

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

Characterization Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Tuesday PM
February 18, 2014

Room: 7A
Location: San Diego Convention Center

Session Chairs: Joseph McKeown, Lawrence Livermore National Laboratory; Daniel Coughlin, Los Alamos National Laboratory

2:00 PM

Processing and Mechanical Behavior of Unalloyed Plutonium: *Adam Farrow*¹; Cameron Knapp¹; Deniece Korzekwa¹; Tarik Saleh¹; Trevor Knapp¹; ¹Los Alamos National Laboratory

2:20 PM

Evolution of Grain Boundary Character during FCC Metal Grain Growth: Justin Brons¹; *Gregory Thompson*¹; ¹University of Alabama

2:40 PM

Kinetically Modified Eutectic Growth during In Situ Rapid Solidification of Thin-film Al-Cu Alloys: *Joseph McKeown*¹; Andreas Kulovits²; Kai Zwickler²; Can Liu²; Bryan Reed¹; Thomas LaGrange¹; Jörg Wiecek²; Geoffrey Campbell¹; ¹Lawrence Livermore National Laboratory; ²University of Pittsburgh

3:00 PM

Deformation Mechanisms and Precipitate Structure in Ni-Base Superalloy 718: *Donald McAllister*¹; Duchao Lv¹; Benjamin Peterson²; Michael Mills¹; ¹The Ohio State University; ²Honeywell Aerospace

3:20 PM

Effects of Composition and Thermal Gradients on Rapid Solidification Microstructures in Hypoeutectic Al-Cu Alloys: *Kai Zwickler*¹; Can Liu¹; Andreas Kulovits²; Joseph McKeown³; Bryan Reed³; Thomas LaGrange³; Geoffrey Campbell³; Jorg Wiecek¹; ¹University of Pittsburgh; ²Carnegie Mellon University; ³Lawrence Livermore National Laboratory

3:40 PM Break

3:50 PM

Elastic and Anelastic Properties of Superalloys: Anomalies Due to Microstructure: *Sarah Driver*¹; Mark Hardy²; Howard Stone¹; Richard Harrison¹; Michael Carpenter¹; ¹University of Cambridge; ²Rolls-Royce plc.

4:10 PM

Material Properties of Nickel Rich NiTiHf Shape Memory Alloys Subjected to Short Term Aging: *Daniel Coughlin*¹; Xiang Chen²; Glen Bigelow³; Anita Garg³; Ronald Noebe³; Michael Mills²; ¹Los Alamos National Laboratory; ²Ohio State University; ³NASA Glenn Research Center

4:30 PM

Microstructure and Electrical Conductivity in Shape and Size Controlled Molybdenum Particle Thick Film: *Youngsoo Jung*¹; Erica Stevens¹; Bo Ding¹; Sun-Dong Kim²; Sang-Kuk Woo²; Jung-Kun Lee¹; ¹University of Pittsburgh; ²Korea Institute of Energy Research

4:50 PM

Optical Constants of Silver Based Alloys in the UV Range: *Kanagasundar Appusamy*¹; Sivaraman Guruswamy¹; Steve Blair¹; ¹University of Utah

5:10 PM

Measurement of the Activity of Cu in Cu-Ni Alloys by Double Knudsen Cell Mass Spectrometry: *Yoshifumi Kobashi*¹; Hideaki Sasaki¹; Masafumi Maeda¹; ¹Institute of Industrial Science, the University of Tokyo

Computational Modeling and Simulation of Advanced Materials for Energy Applications — Continuum Modeling and Beyond

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee

Program Organizers: Lan Li, Boise State University; Laura Bartolo, Kent State University; Cong Wang, Northwestern University; Chandler Becker, NIST

Tuesday PM
February 18, 2014

Room: Mission Hills
Location: San Diego Marriott Marquis & Marina

Session Chairs: Cong Wang, Northwestern University; Lan Li, Boise State University

2:00 PM Invited

Application of Computational Thermodynamics in Solid Oxide Fuel Cell: Yu Zhong¹; ¹Saint-Gobain High Performance Materials

2:30 PM

Mechanical Stability of Solid Oxide Fuel Cell (SOFC) Materials: A Microstructure-based Continuum Modeling Approach: Fadi Abdeljawad¹; *Mikko Haataja*¹; ¹Princeton University

2:50 PM

Phase Wettability and Morphological Evolution in Solid Oxide Fuel Cell Anodes: Ryan Davis¹; Fadi Abdeljawad¹; *Mikko Haataja*¹; ¹Princeton University

3:10 PM

Modeling of Mechano-chemical Degradation of Polymer Membranes in an Operating PEFC: *Randhir Singh*¹; Pang-Chieh Sui¹; Ka Wong²; Erik Kjeang²; Ned Djilali¹; ¹University of Victoria; ²School of Mechatronic Systems Engineering

3:30 PM Break

3:50 PM

Determination and Optimization Best Condition for Bioleaching of Sulfide Low Grade Copper Ore by Using DOE(Design of Experimental) Method and Define a Mathematical Equation: *Hossein Ehtiman*¹; Azadeh Razmi²; ¹GolGohar Mining & Industrial Company; ²Amirkabir University of Technology

4:10 PM

Numerical Simulation for the Splashing Behavior in an Oxygen Converter Process: Zhijun Ji¹; *Chenn Zhou*²; Bin Wu²; Guangwu Tang²; Shiqi Li¹; ¹University of Science and Technology Beijing; ²Purdue University Calumet

4:30 PM

Research on Prediction of the Stability of Partially Stabilized Zirconia Baeds on LM-BP Neural Network: *Li Dongbo*¹; ¹Yunnan Copper Industry Co., LTD

4:50 PM

Effect of the Porosity on Compressive Properties of Porous Materials: *Yilong Liao*¹; Guibao Qiu¹; Jian Xiao¹; Chenguang Bai¹; ¹Chongqing University

5:10 PM

Modeling, Statistical Analyses and Simulations of Random Items and Behavior on Material Surfaces: *Katerina Helisova*¹; ¹Czech Technical University in Prague, Faculty of Electrical Engineering



Computational Thermodynamics and Kinetics — First-principles Calculations

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

Tuesday PM Room: 30D
 February 18, 2014 Location: San Diego Convention Center

Session Chairs: Anton Van der Ven, University of Michigan; Dallas Trinkle, University of Illinois at Urbana-Champaign

2:00 PM

Impact of Local Magnetism on Stacking Fault Energies: A First Principles Investigation for fcc Iron: *Ivan Bleskov*¹; Tilmann Hickel¹; Jörg Neugebauer¹; ¹Max-Planck-Institut für Eisenforschung

2:20 PM

First-principles Calculations of Diffusion Coefficients in Ferromagnetic and Paramagnetic BCC Fe: *Hong Ding*¹; Vsevolod Razumovskiy²; Shenyang Huang³; Gautam Ghosh⁴; Peter Piaw³; Mark Asta¹; ¹University of California, Berkeley; ²Materials Center Leoben Forschung GmbH; ³The University of Tennessee; ⁴Northwestern University

2:40 PM

First-principles Calculations of Solute-grain Boundary Binding in Mg: *Liam Huber*¹; Jörg Rottler¹; Matthias Militzer¹; ¹University of British Columbia

3:00 PM

First-principles Solution Strengthening Model for Iron: *Michael Fellerger*¹; Louis Hector, Jr.²; Dallas Trinkle¹; ¹University of Illinois at Urbana-Champaign; ²General Motors R&D Center

3:20 PM

Ab Initio Study of Gamma1-Al4Cu9: Jaeyoung Kwon¹; Ludovic Thuinet¹; Marie-Noëlle Avettand-Fénoël¹; Alexandre Legris¹; *Rémy Besson*²; ¹Unité Matériaux et Transformations - Université de Lille; ²CNRS - Unité Matériaux et Transformations - Université de Lille

3:40 PM Break

3:55 PM

Ab Initio Modeling of the 1/2<111> Screw Dislocation 2D Energy Landscape and Consequences on the Schmid Law Deviation in BCC Transition Metals: *Lucile Dezerald*¹; Lisa Ventelon¹; David Rodney²; Francois Willaime¹; ¹CEA; ²Grenoble INP

4:15 PM

First-principles Study of Coherent Phase Equilibria in Ti-O: *David Olmsted*¹; Maarten de Jong¹; Paul Erhart²; Mark Asta¹; ¹University of California, Berkeley; ²Chalmers University of Technology

4:35 PM

Interface Segregation and Cohesive Energy for MoSi2-based Alloys: A First-principles Study: *Koretaka Yuge*¹; Yuichiro Koizumi²; Koji Hagihara³; Takayoshi Nakano⁴; Kyosuke Kishida¹; Haruyuki Inui¹; ¹Department of Materials Science and Engineering, Graduate School of Engineering, Kyoto University; ²Institute for Materials Research, Tohoku University; ³Department of Adaptive Machine Systems, Graduate School of Engineering, Osaka University; ⁴Division of Materials & Manufacturing Science, Graduate School of Engineering, Osaka University

4:55 PM

Ab Initio Study on Liquid Metal Embrittlement in the Fe/Zn System: Klaus-Dieter Bauer¹; *Mira Todorova*²; Kurt Hingerl¹; Joerg Neugebauer²; ¹Universitaet Linz; ²Max-Planck-Institut fuer Eisenforschung GmbH

5:15 PM

Atomic Scale Modelling of Point Defects in Materials: Coupling Ab Initio and Elasticity Approaches: *Celine Varvenne*¹; Bruneval Fabien¹; Emmanuel Clouet¹; ¹CEA Saclay

Data Analytics for Materials Science and Manufacturing — Inverse and Forward Modeling

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Jeff Simmons, Air Force Research Laboratory; Charles Bouman, Purdue University; Fariba Fahroo, Air Force Office of Scientific Research; Surya Kalidindi, Georgia Institute of Technology; Jeremy Knopp, Air Force Research Laboratory; Peter Voorhees, Northwestern University

Tuesday PM Room: 32B
 February 18, 2014 Location: San Diego Convention Center

Session Chairs: Charles Bouman, Purdue University; Youssef Marzouk, Massachusetts Institute of Technology

2:00 PM Invited

Forward Modeling of Electron Microscopy: *Marc De Graef*¹; ¹Carnegie Mellon University

2:25 PM Invited

Dictionary-based Diffraction Microscopy for Materials: *Alfred Hero*¹; ¹University of Michigan

2:50 PM Invited

Model-based Iterative Reconstruction for Multimodal Electron Tomography: *Lawrence Drummy*¹; Singanallur Venkatakrishnan²; Marc DeGraef³; Jeff Simmons¹; Charles Bouman²; ¹Air Force Research Laboratory; ²Purdue University; ³Carnegie Mellon University

3:15 PM Invited

Data Analytics for Residual Stress in Materials: *Michael Hill*¹; ¹University of California, Davis

3:40 PM Break

4:00 PM Invited

Microstructure Feature Tracking Using the Forward Modeling Method: *S.F. Li*¹; J. Lind²; J. Bernier¹; C. Hefferan³; R. Suter²; A. Rollet²; M. Kumar¹; ¹Lawrence Livermore National Laboratory; ²Carnegie Mellon University; ³RJLee Group, Inc

4:25 PM Invited

Physics-based Models for Information Processing with Applications to Materials Characterization: *Eric Miller*¹; Shuchin Aeron¹; Brian Tracey¹; Matthew Miller²; ¹Tufts University; ²Cornell University

4:50 PM

Modeling Direct and Inverse Problems in Ferritic Heat-exchanger Tubes: *Harold Sabbagh*¹; John Aldrin²; Kim Murphy³; Elias Sabbagh; ¹Victor Technologies, LLC; ²Computational Tools; ³Victor Technologies, LLC

Deformation, Damage, and Fracture of Light Metals and Alloys III — Al-Mg and Other Alloys

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Ke An, Oak Ridge National Laboratory; Qizhen Li, University of Nevada, Reno

Tuesday PM Room: 19
 February 18, 2014 Location: San Diego Convention Center

Session Chair: Caroline Scheck, Naval Surface Warfare Center

2:00 PM

Effect of Thermal Treatment on the Mechanical Properties of Roll Bonded Al/Mg Laminated Sheets: *Kwang Seok Lee*¹; Su Eun LEE¹; Young-Seon LEE¹; Yong-Nam KWON¹; ¹Korea Institute of Materials Science

2:25 PM

Experimental Investigation of the Mg-Al-Ba System: *Zachary Bryan*¹; Ryan Hooper¹; Michele Manuel¹; ¹University of Florida

2:50 PM

Fatigue Crack Growth Behavior and Thermal Remediation of Al-Mg Alloys after Long Time Low Temperature Exposures: *Mohsen Seifi*¹; John Lewandowski¹; ¹Case Western Reserve University

3:15 PM

The Impact of A₁₃Zr Precipitates on Mechanical Properties Evolution in Al-Mn-Fe-Si Alloys: *Michaela Poková*¹; Miroslav Cieslar¹; ¹Charles University in Prague, Faculty of Mathematics and Physics

3:40 PM Break

3:55 PM

Microstructure and Mechanical Properties in Dissimilar Joint between Al alloy and Cu by Ultrasonic Welding: *Hirofumi Fujii*¹; ¹Tohoku University

4:15 PM

Effect of Cryomilling on the Strengthening and deformation Mechanisms of an Al-Cu-Mg-Ag Alloy: *Lilia Kurmanaeva*¹; Troy D. Topping¹; Julie M. Schoenung¹; Enrique J. Lavernia¹; ¹University of California, Davis, USA

4:40 PM

Investigation of the Mn Additions on the Mechanical Response of HCP Mg-Li-Zn Alloys: *Ryan Hooper*¹; Zachary Bryan¹; Michele Manuel¹; ¹University of Florida

Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — High Strain Rate Effects on Shear Localization

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

Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Tuesday PM

February 18, 2014

Room: 3

Location: San Diego Convention Center

Session Chairs: Ron Armstrong, University of Maryland; Paul Follansbee, St. Vincent College

2:00 PM Keynote

Shear Localization at High Strain Rates: *Alain Molinari*¹; ¹Université Paul Verlaine-Metz

2:30 PM Invited

Shear Bands: The Interplay between Strain and Temperature Gradients: *Elias Aifantis*¹; ¹Aristotle U. Thessaloniki, Greece

2:50 PM Invited

Dynamically Expanding Eshelby Inclusions: Self-similar Motion: *Xanthippi Markenscoff*¹; Luqun Ni²; ¹MAE 0411; ²University of California, San Diego

3:10 PM

Investigation of the Impact-initiated Combustion of Aluminum Using Meso-scale Diagnostics: *Jennifer Breidenich*¹; Gregory Kennedy¹; Zhitao Kang²; Christopher Summers¹; Naresh Thadhani¹; ¹Georgia Institute of Technology; ²Georgia Tech Research Institute

3:30 PM

Numerical Simulation of Instability and Failure in Metals under Dynamic Shear Loading: *Yuriy Bayandir*¹; Oleg Naimark¹; Natalia Savelieva¹; ¹Institute of Continuous Media Mechanics, Ural Branch of Russian Academy of Sciences

3:50 PM Break

4:10 PM

Dynamic Deformation Behavior of Equal Channel Angular Extruded AZ31 Magnesium Alloy: *Eswara Prasad Korimilli*¹; Kelvin Xie¹; Brady Butler¹; N. M. Krywopusk¹; T.P. Wiehs¹; Kevin J Hemker¹; Kalit T Ramesh¹; ¹Johns Hopkins University

4:30 PM

Modeling of Incipient Spall Damage Using Microstructurally Explicit 3D Finite Element Models: Kapil Krishnan¹; Andrew Brown¹; Leda Wayne¹;

*Pedro Peralta*¹; Shengnian Luo²; Darrin Byler³; Robert Dickerson³; Kenneth McClellan³; Aaron Koskelo³; ¹Arizona State University; ²Sichuan University; ³Los Alamos National Laboratory

4:50 PM

Dynamic Strain Localization in F.C.C. Materials: A Perturbation Approach: *M. Arul Kumar*¹; ¹Los Alamos National Laboratory

Electrode Technology for Aluminium Production — Bake Furnace Design and Operation

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Andre Proulx, Rio Tinto Alcan

Tuesday PM

February 18, 2014

Room: 14B

Location: San Diego Convention Center

Session Chair: Jean-Claude Fischer, R&D Carbon Ltd.

2:00 PM Introductory Comments

2:05 PM

Improving Fuel Gas Injection in Anode Baking Furnace: *Fabienne Virieux*¹; Nicolas FIOT²; *Pierre MAHIEU*²; ¹Fives Solios; ²Solios Carbone

2:30 PM

Anode Baking Furnace Firing System Lean Engineering: *Yann El Ghaoui*¹; *Philippe Contard*¹; Christophe Bayard¹; Yvan Foster¹; François Ordonneau¹; Peter Sulzberger¹; Edgard Altmann¹; Raphael Grange¹; Jérémie Lhuissier¹; Patrick Noraz¹; ¹Rio Tinto Alcan

2:55 PM

Effect of Heating Rate on the Crack Formation during Baking in Carbon Anodes Used in Aluminum Industry: *Salah Amrani*¹; Duygu Kocaefe¹; Yasar Kocaefe¹; Brigitte Morais²; Gerry Blaney²; ¹University of Quebec at Chicoutimi; ²Aluminerie Alouette Inc

3:20 PM Break

3:30 PM

Structured Approach to Modernization of Fume Treatment Centers: *Erik Dupon*¹; Edo Engel¹; Rick Oliana¹; Bas Admiraal¹; Peter Klut¹; ¹Danieli Corus

3:55 PM

Upgrade of an Existing Fume Treatment Plant at Aluar to Cope Higher Production in the New Open Type Anode Baking Furnace: *Esteban Cobo*¹; Juan Artola¹; Luis Beltramino¹; Frank Heinke²; Detlef Maiwald²; Domenico Di Lisa²; ¹Aluar Aluminio Argentino; ²Innovatherm Prof.-Dr. Leisenberg GmbH & Co KG

Energy Technologies and Carbon Dioxide Management — Novel Technologies and Life Cycle Assessment

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Education Committee, TMS: Energy Committee

Program Organizers: Cong Wang, Northwestern University; Jan de Bakker, BBA, Inc; Cynthia Belt, Consultant; Animesh Jha, University of Leeds; Neale Neelameggham, Ind LLC; Soobhankar Pati, MOxST Inc.; Leon Prentice, CSIRO

Tuesday PM

February 18, 2014

Room: Balboa

Location: San Diego Marriott Marquis & Marina

Session Chairs: Neale Neelameggham, Ind LLC; Jan De Bakker, BBA, Inc.

2:00 PM Keynote

Pure Oxygen Anodes™ for Low- or Zero-carbon Energy Efficient Metal Oxide Reduction: *Adam Powell*¹; Matthew Earlam¹; Salvador Barriga¹; ¹Infinium, Inc.

2:30 PM Invited

Electrochemistry of Fe(III) in Molten Salt CaCl₂-KF and CaCl₂-CaF₂-KF: Li Li¹; Xuan Liu²; *Shulan Wang*¹; ¹Northeastern University; ²Carnegie Mellon University



3:00 PM

Novel LiNO₃-NaNO₃-KNO₃-NaNO₂ Molten Salts for Solar Thermal Energy Storage Applications: *Tao Wang*¹; Ramana Reddy¹; ¹The University of Alabama

3:20 PM Break

3:40 PM Invited

Sustainable Materials Extraction: *Antoine Allanore*¹; ¹Massachusetts Institute of Technology

4:10 PM

Life Cycle Assessment of Different Gold Extraction Process: Chao Li¹; Hongxu Li¹; Meng Wang¹; Xie Yang¹; Xiangxin Hao¹; ¹University of Science and Technology

4:30 PM

Performance Evaluation, Technical and Environmental Aspects of Biomass Cookstoves: An Exergy Approach: *S Tyagi*¹; A Pandey¹; Kunwar Pal¹; ¹SSS-National Institute of Renewable Energy

4:50 PM

Economical Desulfurization of Petroleum Coke: *Louis Herrington*¹; ¹LEHCO

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Characterization and Modeling of Fatigue Crack Initiation and Growth

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

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

Tuesday PM
February 18, 2014

Room: 7B
Location: San Diego Convention Center

Session Chairs: Jacob Hochhalter, NASA LaRC; Antonios Kontsos, Drexel University

2:00 PM Break

2:05 PM Invited

3D Characterization and Modeling of Fatigue Cracks: *Anthony Rollett*¹; Robert Suter¹; ¹Carnegie Mellon University

2:25 PM Invited

Development of Techniques for Investigating Fatigue Behavior in the Very High Cycle Fatigue Regime: *J. Wayne Jones*¹; Jason Geathers¹; Chris Torbet²; Samantha Daly¹; ¹University of Michigan; ²University of California Santa Barbara

2:45 PM Invited

Fatigue Crack Initiation in Metal Matrix: *Guocai Chai*¹; ¹Sandvik Materials Technology

3:05 PM

Predicting the Behavior of Small Fatigue Cracks: *Jamie Kruzic*¹; ¹Oregon State University

3:25 PM

Load-Interaction Effects on the Stress Field around a Fatigue Crack Tip: *Soo Yeol Lee*¹; E-Wen Huang²; Wanchuck Woo³; Kuan-Wei Lee²; ¹Chungnam National University; ²National Central University; ³Korea Atomic Energy Research Institute

3:45 PM Break

4:05 PM

Effect of Service Time on Fatigue Crack Propagation Behavior of Inconel 718 for J85 Engine Turbine Disc: *Daeho Jeong*¹; Doohong Ahn¹; Sangshik Kim¹; ¹Gyeongsang National University

4:25 PM

Predictions of Microstructurally Driven Fatigue Crack Initiation and Scatter in Polycrystalline Materials: *Saikumar Reddy Yeratapally*¹; Michael Sangid¹; Michael Glavicic²; Robert Goetz²; ¹Purdue University; ²Rolls Royce Corporation

4:45 PM

The Anisotropy of Fatigue Crack Nucleation in an AA7075 T651 Al Alloy Plates: *Yan Jin*¹; Tongguang Zhai¹; ¹University of Kentucky

5:05 PM Concluding Comments

Gamma TiAl Alloys 2014 — Session IV

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Titanium Committee

Program Organizers: Young-Won Kim, Gamteck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimiduk, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

Tuesday PM
February 18, 2014

Room: 6B
Location: San Diego Convention Center

Session Chairs: Harayuki Inui, Kyoto University; Sara Biamino, Politecnico di Torino

2:00 PM Invited

Fundamental and Application-oriented Research on Gamma Alloys: *Rui Yang*¹; ¹Institute of Metal Research CAS

2:25 PM

Deformation of PST Crystals of Ti₄₆Al₈Nb and Ti₄₆Al₈Ta: *Yina Guo*¹; Ronghua Liu²; Hao Jin²; Rui Yang²; Aijun Huang³; Michael Loretto⁴; ¹University of Limerick; ²Institute of Metal Research Chinese Academy of Sciences; ³Shanghai Baosteel Group Corporation; ⁴University of Birmingham

2:45 PM

Development of TiAl Alloys with Enhanced Room Temperature Ductility: A Fundamental Study Using In Situ TEM: *Seong-Woong Kim*¹; Jae Keun Hong¹; Young-Sang Na¹; Jong-Taek Yeom¹; Seung-Eon Kim¹; ¹Korea Institute of Materials Science (KIMS)

3:05 PM

Tailoring Lamellar Microstructure through Heat Treatment Design of TiAl Alloys: *Chunyu Teng*¹; Dongsheng Xu¹; Yunzhi Wang²; Rui Yang¹; ¹Institute of Metal Research, Chinese Academy of Sciences; ²Department of Materials Science and Engineering, The Ohio State University

3:25 PM

Thermal Stability of Lamellar Microstructure in Ti₂AlN/TiAl(4822) Composites: *Yiwen Liu*¹; Rui Hu¹; Tiebang Zhang¹; Hongchao Kou¹; Jinshan Li¹; ¹State Key Laboratory of Solidification Processing, Northwestern Polytechnical University

3:45 PM Break

4:05 PM Invited

Anisotropy in Mechanical Properties and Directional Solidification of Lamellar TiAl: *Haruyuki Inui*¹; Kyosuke Kishida¹; ¹Kyoto University

4:30 PM

Fracture Toughness of the Constituent Phases and Interfaces of PST-TiAl Crystals as Measured by Microcantilever Tests: *Mathias Göken*¹; Farasat Iqbal¹; Karsten Dürst¹; ¹Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

4:50 PM

Deformation Induced Internal Stresses in Multiphase Titanium Aluminide Alloys: *Fritz Appel*¹; Roland Hoppe¹; ¹Helmholtz Zentrum Geesthacht

5:10 PM

Influence of Aluminum Content on the Columnar-to-equiaxed Transition in Ti-Al-X Gamma Titanium Aluminides: *Nicole Reilly*¹; Julien Zollinger¹; Dominique Daloz¹; Céline Marcillaud²; ¹Institut Jean Lamour; ²SNECMA (Safran Group)

High-temperature Gamma (f.c.c.) /Gamma-Prime (L12 structure) Co-Al-W Based Superalloys — Defects and Microstructural Evolution

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee

Program Organizers: David Seidman, Northwestern University; David Dunand, Northwestern University; Chantal Sudbrack, NASA Glenn Research Center; Carelyn Campbell, National Institute of Standards and Technology; Ursula Kattner, National Institute of Standards and Technology; David Dye, Imperial College

Tuesday PM Room: 5A
February 18, 2014 Location: San Diego Convention Center

Session Chairs: David Seidman, Northwestern University; Chantal Sudbrack, National Aeronautics and Space Administration

2:00 PM Invited

From Ni- to Co-based Superalloys: γ' Phase Stability and Superlattice Stacking Fault Energies: *Alessandro Mottura*¹; Tresa Pollock²; ¹University of Birmingham; ²University of California, Santa Barbara

2:30 PM Invited

APB Energetics of Co₃(Al,W) L1₂ γ' : *James Saal*¹; Chris Wolverton¹; ¹Northwestern University

3:00 PM

Physical Metallurgy and Creep Behaviour of Some Candidate Co-base Superalloys: *Matthias Knop*¹; Vassili Vorontsov¹; Mark Hardy²; David Dye¹; ¹Imperial College London; ²Rolls-Royce plc

3:20 PM Break

3:40 PM Invited

Coarsening Kinetics of γ' Precipitates in Cobalt-base Alloys: Subhashish Meher¹; Soumya Nag¹; Jamie Tiley²; *Rajarshi Banerjee*¹; ¹University of North Texas; ²Airforce Research Laboratory

4:10 PM

Microstructure and Mechanical Behavior of a High-temperature Co-Al-W-Ti-B Superalloy: *Daniel Souza*¹; Noam Eliaz¹; Peter Bocchini¹; David Dunand¹; David Seidman¹; ¹Northwestern University

4:30 PM Concluding Comments

Hume-Rothery Award Symposium: Thermodynamics and Kinetics of Engineering Materials — Iron-base Systems

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Hans Juergen Seifert, Karlsruhe Institute of Technology (KIT); Alan Luo, The Ohio State University; Peter Uggowitzer, ETH Zürich; Fan Zhang, CompuTherm, LLC

Tuesday PM Room: 6C
February 18, 2014 Location: San Diego Convention Center

Session Chairs: John Morral, The Ohio State University; Sinn-wen Chen, National Tsing Hua University (Taiwan)

2:00 PM Invited

Application of the CALPHAD Method for Ferritic Boiler Steels: *André Schneider*¹; ¹V&M Deutschland GmbH

2:20 PM Invited

Thermodynamic Properties of Al Cr Fe Alloys Experimental Investigation by Knudsen Effusion Mass Spectrometry: *Torsten Markus*¹; ¹Forschungszentrum Juelich GmbH

2:40 PM

Phase Stability in Fe-rich Fe-Cr-Ni-Mo system: *Ying Yang*¹; Lizhen Tan¹; Jeremy Busby¹; ¹Oak Ridge National Laboratory

3:00 PM

Interfacial Reaction between Steel Sheets and Zn Coating Layer: *SeungPill Jung*¹; ByeongJoo Lee¹; ¹POSTECH

3:20 PM Invited

Study of Mechanism and Real Time Simulation of Ammonia (NH₃) Nitridation with a DFT Calculation and a KMC Simulation: Sang Chul Yeo¹; *Hyuck Mo Lee*¹; ¹KAIST

3:40 PM Break

4:00 PM

Anharmonic Phonon Entropy in Alpha-Fe at Elevated Temperatures: *Lisa Mauger*¹; Matthew Lucas¹; Jorge Munoz¹; Sally Tracy¹; Brent Fultz¹; ¹California Institute of Technology

4:20 PM

Phase-field Model with Gibbs Energy Formulation Using the Sublattice Formalism: *Oleg Scchyglo*¹; Lijun Zhang²; Ingo Steinbach¹; ¹Ruhr-University; ²Central South University

4:40 PM

Experimental Determination of Solid/Liquid Equilibria of Systems with Reactive Components: Example of the Ternary Fe-Ti-B System: *Annie Antoni-Zdziolek*¹; Maya Gospodinova¹; Fiqiri Hodaj¹; Frédéric Bonnet²; ¹SIMaP / Grenoble INP; ²Arcelor Mittal Research SA

ICME: Linking Microstructure to Structural Design Requirements — ICME: Linking Microstructure to Structural Design Requirements IV

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Rajiv Mishra, University of North Texas; David Furrer, Pratt & Whitney; Peter Collins, University of North Texas; Charles Ward, Air Force Research Laboratory; Craig McClung, Southwest Research Institute

Tuesday PM Room: 31A
February 18, 2014 Location: San Diego Convention Center

Session Chair: Charles Ward, Air Force Research Laboratory

2:00 PM Invited

Sandia's Multiscale Program to Understand and Manage Material Variability in Structural Applications: *Brad Boyce*¹; Corbett Battaile¹; Joseph Bishop¹; Arthur Brown¹; Thomas Buchheit¹; Jay Carroll¹; Blythe Clark¹; Lisa Deibler¹; John Emery¹; Richard Field¹; James Foulk¹; Lucas Hale¹; Khalid Hattar¹; Paul Kotula¹; Hojun Lim¹; Jonathan Madison¹; Jeffrey Rodelas¹; Donald Susan¹; Christopher Weinberger¹; Jonathan Zimmerman¹; ¹Sandia National Laboratories

2:40 PM Invited

Development of High Temperature Steels for Advanced Ultrasupercritical Steam Turbines: Siwei Cao¹; Changdong Wei¹; *Ji-Cheng Zhao*¹; ¹The Ohio State University

3:20 PM

Strategic Characterization of Two-phase Superalloy Microstructure for Development of Physics-based Multi-scale Modeling Platform: *Jessica Krogstad*¹; David Eastman¹; Luke Rettberg²; Tresa Pollock²; Kevin Hemker¹; ¹Johns Hopkins University; ²University of California, Santa Barbara

3:40 PM Break

4:00 PM

Modeling the Influence of Microstructure on Residual Stress Relaxation of a Shot-peened Nickel-base Superalloy Exposed at Elevated Temperature: *Micheal Burba*¹; Dennis Buchanan²; Michael Caton³; Christopher Szczepanski³; Reji John³; ¹University of Dayton; ²University of Dayton Research Institute; ³Air Force Research Laboratory

4:20 PM

Effect of Applied Stresses and Stress Gradient on Residual Stresses in Shot Peened Superalloys: *Dennis Buchanan*¹; Reji John²; ¹UDRI; ²AFRL



4:40 PM

Influence of Prestrain and Microstructure on the Creep Behavior of a Nickel-base Superalloy: *Michael Burba*¹; Dennis Buchanan²; Michael Caton³; Christopher Szczepanski³; Reji John³; ¹University of Dayton; ²University of Dayton Research Institute; ³Air Force Research Laboratory

Light-metal Matrix (Nano)-composites — Emerging Processes

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee, TMS: Magnesium Committee

Program Organizers: Wim Sillekens, European Space Agency; Dmitry Eskin, Brunel University

Tuesday PM Room: 17B
February 18, 2014 Location: San Diego Convention Center

Session Chair: Manoj Gupta, National University of Singapore

2:00 PM Keynote

Solidification Nanoprocessing of Metallic Nanocomposites: From Nanoscience to Nanoproduction: *Xiaochun Li*¹; ¹University of Wisconsin-Madison

2:30 PM

The Physical-mechanical Properties of Aluminum Nanocomposites Produced by High Energy Explosion Impact: *Sergey Vorozhtsov*¹; *Alexander Vorozhtsov*¹; *Sergey Kulkov*¹; *Vitaly Komarov*²; ¹Tomsk State University; ²Institute for Problems of Chemical and Energetic Technologies of the SB RAS

2:50 PM

Achieving Uniform Distribution and Dispersion of a High Percentage Nanoparticles in Mg18Sn Matrix by Solidification Processing: *Lianyi Chen*¹; *Jun-Yang Peng*¹; *Jiaquan Xu*¹; *Hongseok Choi*¹; *Xiaochun Li*¹; ¹University of Wisconsin Madison

3:10 PM

Processing of Metal Matrix Composites Under External Fields and Their Application as Grain Refiner: *Edward Djan*¹; *Sreekumar Madam*¹; *Nandendla Babu*¹; *Javier Tamayo-Ariztondo*¹; *Dmitry Eskin*¹; *Zhomgyun Fan*¹; ¹BCAST

3:30 PM Break

3:50 PM Invited

Grain Refinement and Nanoparticles Dispersion Using Traveling Magnetic Field: *Mariano Garrido Pacheco*¹; *Yves Fautrelle*¹; *Mustafa Megahed*²; *Laurent Davoust*¹; *Valdis Bojarevics*³; *Koulis Pericleous*³; *Ole Koeser*⁴; ¹SIMAP-EPM; ²ESI; ³University of Greenwich; ⁴Centre of Innovation Manageom

4:10 PM

Effect of Nano-reinforcement on Properties of Cast Mg-Al Alloy AZ₉₁: *Mohamed Gamal Mahmoud*¹; *Iman El-Mahallawi*¹; *Ragaie Mohamed Rashad*¹; ¹Cairo University, Faculty of Engineering

4:30 PM

Nanoparticles Distribution and Mechanical Properties of a Few Aluminum Alloys Matrix Nano-composites Treated with External Fields: *Javier Tamayo-Ariztondo*¹; *Sreekumar VadakkeMadam*¹; *Edward Djan*¹; *Zhongyun Fan*¹; *Hari Babu Nadendla*¹; *Dmitry Eskin*¹; ¹Brunel University

4:50 PM

Manufacturing of Nano-surface AA₇₀₇₅ Composites by Friction Stir Processing: *Mohamed Ahmed*¹; *Mohamed Refat*²; *Iman El Mahallawi*³; ¹Suez Canal University; ²British University in Egypt; ³Cairo University

5:10 PM

Magnesium Metal Matrix Nanocomposites By Electromagnetic Acoustic Transduction: *Hunter Henderson*¹; *Zachary Bryan*¹; *Orlando Rios*²; *Alexander Melin*²; *Gerard Ludtka*²; *Gail Mackiewicz-Ludtka*²; *Michele Manuel*¹; ¹University of Florida; ²Oak Ridge National Laboratory

Magnesium Technology 2014 — Deformation II

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Tuesday PM Room: 17A
February 18, 2014 Location: San Diego Convention Center

Session Chairs: Kiran Solanki, Arizona State University; Warren Poole, University of British Columbia

2:00 PM

Dislocation Activity in AZ₃₁B Magnesium Deformed at Moderately Elevated Temperatures via EBSD: *Timothy Ruggles*¹; *Ali Khosravi*¹; *Fullwood David*¹; *Michael Miles*¹; ¹BYU

2:20 PM

Deformation, Recrystallization and Grain Growth Behavior of Large-strain Hot Rolled Binary Mg-1Dy Alloy: *Indranil Basu*¹; *Talal AlSamman*¹; ¹RWTH Aachen

2:40 PM

Static Recrystallization and Grain Growth in a Magnesium AZ31B-H24 Alloy Sheet: *Aravindha Antoniswamy*¹; *Jon Carter*²; *Louis Hector*²; *Eric Taleff*¹; ¹University of Texas at Austin; ²General Motors Corporation

3:00 PM

Deformation Behavior and Dynamic Recrystallization of Micro-alloyed Mg-Al-Ca Alloys during High Temperature Deformation: *Jing Su*¹; *Abu Syed Humaun Kabir*¹; *In-Ho Jung*¹; *Steve Yue*¹; ¹McGill

3:20 PM

Physically-based Model for Static Recrystallization in AZ₃₁: *Paul Okrutny*¹; *Shenglong Liang*¹; *Lingyao Meng*¹; *Hatem Zurob*¹; ¹McMaster University

3:40 PM Break

4:00 PM

The Role of Deformation Modes on Ductility and Dynamic Recrystallization Behavior of AZ31 Mg Alloy at Low Temperatures: *Ebubekir Dogan*¹; *Matthew Vaughan*¹; *Ceylan Hayrettin*¹; *Ibrahim Karaman*¹; *Georges Ayoub*²; ¹Texas A&M University; ²Texas A&M University at Qatar

4:20 PM

Recrystallization Behavior of Binary Mg Alloys: *Victoria Miller*¹; *Jian-Feng Nie*²; *Tresa Pollock*¹; ¹University of California Santa Barbara; ²Monash University

4:40 PM

Effect of Microstructure on Deformation and Fracture of Thixomolded and Thermomechanically Processed AZ₆₃: *Tracy Berman*¹; *William Donlon*¹; *Raymond Decker*²; *Tresa Pollock*³; *J. Wayne Jones*¹; ¹University of Michigan; ²nanoMAG, LLC.; ³University of California Santa Barbara

5:00 PM

Microstructure Evolution and Mechanical Properties of Mg-14%Li-1%Al Alloy during the High-pressure Torsion: *Chenguang Tian*¹; *Huimin Lu*¹; *Liyuan Zhao*¹; ¹Beihang University

Magnetic Materials for Energy Applications IV — Fundamentals of the Magnetocaloric Effect and Current Status of Magnetic Cooling Technology

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Thomas G. Woodcock, IFW Dresden; Julia Lyubina, Evonik Industries AG; Matthew Willard, Case Western Reserve University

Tuesday PM
February 18, 2014

Room: Ballroom G
Location: San Diego Marriott Marquis & Marina

Session Chairs: Julia Lyubina, Evonik Industries AG; Ekkes Brück, Delft University of Technology

2:00 PM Invited

Giant Magnetocaloric Effect: Is There Room for Improvement?: *Vitalij Pecharsky¹; Yaroslav Mudryk²; Durga Paudyal²; Karl Gschneidner²; ¹Iowa State University; ²Ames Laboratory, Iowa State University*

2:30 PM Invited

Overview of the Characteristic Features of the Magnetic Phase Transition with Regards to the Magnetocaloric Effect: the Hidden Relationship between Hysteresis and Latent Heat: *Kelly Morrison¹; ¹Loughborough University*

3:00 PM Invited

Electronic and Magnetic Properties of Ni₂MnGa and RT₅ Alloys: *Ingo Opahle¹; ¹ICAMS, Ruhr-Universität Bochum*

3:30 PM Break

3:45 PM

Combined Phase Field Method and Micromagnetic Simulations of Magnetic Phase Transition in NiMnInCo Metamagnetic Alloys: *Houbing Huang¹; Xingqiao Ma²; Jianjun Wang²; Long-Qing Chen¹; ¹Penn State University; ²USTB*

4:05 PM Invited

Commercialising Magnetic Refrigeration: *Neil Wilson¹; ¹Cambridge Ltd.*

4:35 PM Invited

Magnetocaloric Refrigeration Concepts: Current State of the Art: *Kaspar Nielsen¹; ¹Technical University of Denmark*

5:05 PM Invited

First-order Transition Magnetocaloric Materials in Rotary Magnetic Refrigerators: *Carl Zimm¹; Steven Jacobs¹; ¹Astronautics Corporation of America*

Materials and Fuels for the Current and Advanced Nuclear Reactors III — Structural Materials II

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

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Tuesday PM
February 18, 2014

Room: 33C
Location: San Diego Convention Center

Session Chair: Raul Rebak, GE Global Research

2:00 PM Invited

Insights into Atomic Scale Microstructures of Alloys under Corrosive Environments: *Emmanuelle Marquis¹; Yimeng Chen¹; Yan Dong¹; Kevin Fisher¹; Arthur Motta²; Sebastien Teysseyre²; ¹University of Michigan; ²Penn State University; ³Idaho National Laboratory*

2:25 PM

Characterization of Nanostructured Ferritic Alloy Atomized with Yttrium and a Controlling Oxygen Content: *Nicholas Cunningham¹; Yuan Wu¹; G. Odette¹; David Hoelzer²; Stuart Maloy³; ¹UC Santa Barbara; ²Oak Ridge National Laboratory; ³Los Alamos National Laboratory*

2:40 PM

High Resolution Transmission Microscopy Characterization of an Oxide Dispersion Strengthened Steel Ball-milled Powder: *Marie Loyer-Prost¹; Joel Ribis¹; Jean-Sébastien Mérot²; Yann Lebouar²; Laurent Chaffron¹; Fabrice Legendre¹; ¹CEA Saclay; ²ONERA*

2:55 PM

Advanced Electron Microscopic Examination Aided in the Identification of Silver and Palladium in Irradiated TRISO Coated Particles: *Isabella van Rooyen¹; Thomas Lillo¹; Yaqiao Wu²; ¹Idaho National Laboratory; ²Boise State University,*

3:10 PM

Study of Ordering Transformation in Ni-based Superalloy 690: *Talukder Alam¹; Iman Ghamarian¹; Tanaporn Rojhiransakool¹; Soumya Nag¹; Rajarshi Banerjee¹; ¹University of North Texas*

3:25 PM Break

3:45 PM

Synchrotron Study on Loading Partitioning with Phase Development in an Austenitic 304 ODS: *Kun Mo¹; Zhangjian Zhou²; Yinbin Miao¹; Hsiao-Ming Tung³; Jonathon Almer⁴; Meimei Li⁴; James Stubbins¹; ¹University of Illinois; ²University of Science and Technology Beijing; ³Atomic Energy Council; ⁴Argonne National Laboratory*

4:00 PM

Characterization of Hot Deformation Behavior of Zr-1Nb Alloy: *Apu Sarkar¹; Jayanta Chakravarty²; ¹North Carolina State University; ²Bhabha Atomic Research Centre*

4:15 PM

Thermo-mechanical and Microstructural Characterization of Molybdenum-alloy/Zirconium Alloys/FeCrAlY Composite Tubing for Fuel Cladding of Light Water Reactors: *Cristian Cionea¹; D. Fraser¹; A. Magyar¹; J.L. Sabella¹; M.T. Loff¹; D. Moon¹; M.J. Swabowski¹; R. Meyer¹; P. Chou²; Bo Cheng²; Young Kim³; P. Hosemann¹; ¹University of California Berkeley; ²Electrical Power Research Institute; ³GE Global Research*

4:30 PM

High Energy X-ray Diffraction Study of Deformation Behavior of Alloy HT9: *Carolyn Tomchik¹; Kun Mo¹; Jonathan Almer²; Stuart Maloy³; James Stubbins¹; ¹University of Illinois at Urbana-Champaign; ²Argonne National Laboratory; ³Los Alamos National Laboratory*

4:45 PM

Development of Nanostructured Ferritic Alloys Containing Lanthana-based Nanoparticles via Spark Plasma Sintering: *Somayeh Pasebani¹; Indrajit Charit¹; Kerry Allahar²; Yaqiao Wu²; Jatuporn Burns²; James Cole²; Darryl Butt³; ¹University of Idaho; ²Center for Advanced Energy Studies; ³Boise State University*

5:00 PM

Effect of Ball Milling Temperature on the Ultra Fine Grained Microstructure of Oxide Dispersion Strengthened Steel: *Jeoung Han Kim¹; Chan Hee Park¹; Seong Woong Kim¹; Jong Taek Yeom¹; Jae Keun Hong¹; T.S. Byun²; Eun Joo Shin³; Bong Ho Lee⁴; ¹Korea Institute of Materials Science; ²Oak Ridge National Laboratory; ³Korea Atomic Energy Research Institute; ⁴National Center for Nanomaterials Technology at POSTECH*

5:15 PM

Stable Storage of He in Nanometer-scale Interfacial Platelets: *Michael Demkowicz¹; Abishek Kashinath¹; ¹Massachusetts Institute of Technology*



Materials for High-temperature Applications: Next Generation Superalloys and Beyond — Nb- and Ni-Based Alloys

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Refractory Metals Committee

Program Organizers: Omer Dogan, DOE National Energy Technology Laboratory; Panos Tsakiroopoulos, University of Sheffield; Xingbo Liu, West Virginia University; Paul Jablonski, DOE National Energy Technology Lab; Junpin Lin, University of Science and Technology Beijing

Tuesday PM
February 18, 2014

Room: 6D
Location: San Diego Convention Center

Session Chairs: Panos Tsakiroopoulos, University of Sheffield; S.K. Varma, University of Texas at El Paso

2:00 PM

Niobium Based Alloys: A Review of Breakthroughs: *Panayiotis Tsakiroopoulos*¹; ¹University of Sheffield

2:20 PM

Influence of Powder Metallurgical Processing Routes on Phase Formations in a Multi-Component NbSi-Alloy: *Christoph Seemüller*¹; Martin Heilmaier¹; Thomas Hartwig²; Marco Mulser²; Nicholas Adkins³; Michael Wickins³; ¹Karlsruhe Institute of Technology; ²Fraunhofer Institute for Manufacturing Technology and Advanced Materials; ³The University of Birmingham

2:40 PM

First Principle Calculations of Properties of Phases in Nb Silicide Based Alloys: *Ioannis Papadimitriou*¹; Claire Utton¹; Andrew Scott²; Panayiotis Tsakiroopoulos¹; ¹University of Sheffield; ²University of Leeds

3:00 PM

Effect of Rhenium on Nb - Alloys with Additions of Al, B, W: *Ruth Sierra*¹; Shailendra Varma¹; ¹University of Texas at El Paso

3:20 PM

Effect of Solidification Processing on the Microstructure of Near Eutectic Nb-silicide Based Alloys with Refractory Metal Additions: *Conor McCaughey*¹; Panayiotis Tsakiroopoulos¹; ¹University of Sheffield

3:40 PM Break

3:55 PM

Response of Nb-25Cr-15Mo-(20,15)Si-(10,15)B Alloys to Long Term Oxidation in Air from 700-1400°C: *Kathryn Thomas*¹; Shailendra Varma¹; ¹The University of Texas at El Paso

4:15 PM

A Study of the Effects of Hf and Sn Additions in the Microstructure of Nb Silicide Based Alloys: Eleftherios Zacharis¹; *Panayiotis Tsakiroopoulos*¹; ¹University of Sheffield

4:35 PM

Development of Ni-Cr Based Alloys via Spark Plasma Sintering for High Temperature Applications: *Somayeh Pasebani*¹; Aniket Dutt²; Indrajit Charit¹; Rajiv Mishra²; ¹University of Idaho; ²University of North Texas

4:55 PM

Influence of Cr Content on Diffusion Behavior of Te into Ni-Cr Alloys: *Li Zhijun*¹; Han Fenfen¹; Jiang Lii¹; Yuan Guangzhou¹; ¹Shanghai Institute of Applied Physics

Materials Processing Fundamentals — TWIP/ Steelmaking

Sponsored by: TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee

Program Organizers: James Yurko, Materion Brush Beryllium and Composites; Lifeng Zhang, University of Science and Technology Beijing; Antoine Allanore, Massachusetts Institute of Technology; Cong Wang, Northwestern University

Tuesday PM
February 18, 2014

Room: 11B
Location: San Diego Convention Center

Session Chair: Lifeng Zhang, University of Science and Technology Beijing

2:00 PM

Formation of Non-metallic Inclusions in the Molten Steel in MgO Crucibles: *Lifeng Zhang*¹; ¹University of Science and Technology Beijing

2:20 PM

Effect of Removal of Inclusion Particles on Hydrogen Permeability of Pt-Gd Film: *Ryo Inoue*¹; Yoshihiro Oda²; Shun-Ichiro Tanaka¹; ¹Tohoku University; ²Toyota Industries Corporation

2:40 PM

Experimental Research of Continuous Temperature Measurement for Molten Metal Bath through Bottom-blowing Component: *Yong Ren*¹; Shuai Niu¹; Wencai Li¹; Xin Hong¹; ¹Shanghai University

3:00 PM

Novel Contactless Sensor for Measuring Surface Velocity of Melting Metal: *Dandan Schumacher*¹; Christian Karcher; ¹Ilmenau University of Technology

3:20 PM Break

3:30 PM

AlN Formation in High-Al and High-Mn Alloyed Advanced High Strength Steels: *Jung-Mock Jang*¹; Do-Hyeong Kim¹; Min-Kyu Paek¹; Jong-Jin Pak¹; ¹Hanyang University

3:50 PM

Delayed Fracture Behavior Related with Intergranular Precipitation of Cementites in High-Mn TWinning Induced Plasticity (TWIP) Steels: *Junghoon Lee*¹; Seokmin Hong¹; Byeong-Joo Lee¹; Hyung Seop Kim¹; Sung-Kyu Kim²; Kwang-Guen Chin²; Young Won Chang³; Sunghak Lee¹; ¹POSTECH; ²POSCO; ³GIFT

4:10 PM

Interfacial Reactions between Slag and Melt in the New World of High Manganese Steels: *Mohammad Peymandar*¹; Sebastian Schmuck¹; Petrico von Schweinichen¹; Dieter Senk¹; ¹Department of Ferrous Metallurgy, IEHK, RWTH Aachen

4:30 PM

The Influence of Silicon on the Partitioning of Carbon during Aging of High Manganese and Aluminum Steel: *laura Bartlett*¹; David Van Aken²; Julia Medvedeva²; Dieter Isheim²; Nadejda Medvedeva²; Kai Song⁴; ¹Texas State University; ²Missouri University of Science and Technology; ³Northwestern University; ⁴FEI Company

4:50 PM

Assessment of Hydrogen Solubility in the CaO-SiO₂-FeO_t Based Welding Flux System Containing NaF: *Sunghoon Chung*¹; ¹Yonsei University, Seoul

Mechanical Behavior at the Nanoscale II — Multiscale Modeling

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Tuesday PM
February 18, 2014

Room: 9
Location: San Diego Convention Center

Session Chairs: Christopher Weinberger, Drexel University; Helena Van Swygenhoven, Paul Scherrer Institut

2:00 PM Invited

Coupled Atomistics and Discrete Dislocations in 3d (CADD-3d): Approach, Progress, and Issues: *W Curtin*¹; JF Molinari¹; Ben Szajewski¹; Till Junge¹; Guillaume Anciaux¹; ¹EPFL

2:30 PM Invited

Molecular Dynamics Modeling of Plastic Deformation and Fracture of Nano-crystalline Thin Films: G. P. Purja Pun¹; E. H. Glaessgen²; *Y. Mishin*¹; ¹George Mason University; ²NASA Langley Research Center

3:00 PM

Avalanche Statistics of a Dipolar Mat in a Simplified Micro-structural Environment: *Peter Derler*¹; Robert Maass²; ¹Paul Scherrer Institut; ²University of Göttingen

3:20 PM

Convolutd Thermal/Spatial Statistics of Nanoindentation Pop-in Tests as Plasticity Initiation in Small Stressed Volumes: *Yanfei Gao*¹; Tianlei Li¹; Hongbin Bei²; James Morris²; Easo George²; ¹University of Tennessee; ²Oak Ridge National Laboratory

3:40 PM Break

3:55 PM Invited

Insights into Confined Plasticity in Micropillars from Atomistic Simulations: *Christopher Weinberger*¹; Garritt Tucker¹; Zachary Aitken²; Julia Greer²; ¹Drexel University; ²California Institute of Technology

4:25 PM Invited

From Defective Twin Boundaries to Angstrom-scaled Twins: Understanding the Plasticity and Fracture of Nanotwinned Metals: *Frederic Sansoz*¹; ¹The University of Vermont

4:55 PM

A Comparative Study on the Plastic Response of Various Nanotwinned Metals: *Timothy Furnish*¹; Andrea Hodge¹; ¹University of Southern California

5:15 PM

Phase Transformation in Single Layer Molybdenum Disulphide (MoS₂) Under Tension via Molecular Dynamics Simulation: *Khanh Dang*¹; Joseph Simpson¹; Douglas Spearot¹; ¹University of Arkansas

Mechanical Behavior Related to Interface Physics II — Interfacial Effects on Radiation Tolerance and Chemical Stability

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Nan Li, Los Alamos National Laboratory; Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Tonya Stone, Mississippi State University

Tuesday PM
February 18, 2014

Room: 11A
Location: San Diego Convention Center

Session Chairs: Khalid Hattar, Sandia National Laboratories; Jian Wang, Los Alamos National Laboratory

2:00 PM Invited

Grain Boundary-defect Interactions Under Loading of Irradiated Nanocrystalline Films: *Mitra Taheri*¹; ¹Drexel University

2:30 PM Invited

In Situ Atomic-scale Observation of Irradiation-induced Void Formation: Weizong Xu¹; Yongfeng Zhang²; Paul Millet²; Carl Koch¹; S.N. Mathaudhu¹; *Yuntian Zhu*¹; ¹North Carolina State University; ²Idaho National Laboratory

3:00 PM

A Study of the Dynamical Behavior of Dislocations in Irradiated Nanocrystalline Iron by In Situ TEM Tensile Testing: *Greg Vetterick*¹; Christopher Barr¹; Jon Baldwin²; Pete Baldo³; Daniel Kiener⁴; Khalid Hattar⁵; Mark Kirk³; Amit Misra²; Mitra Taheri¹; ¹Drexel University; ²Los Alamos National Laboratory; ³Argonne National Laboratory; ⁴University of Leoben; ⁵Sandia National Laboratories

3:20 PM Break

3:40 PM Invited

In Situ Ion Irradiation and Fatigue TEM Experiments of Nanocrystalline Metals: *Khalid Hattar*¹; Claire Chisholm²; John Sharon¹; Brad Boyce¹; Andrew Minor³; ¹Sandia National Laboratories; ²University of California, Berkeley; ³University of California, Berkeley

4:10 PM Invited

Towards Statistical and Comprehensive Three Dimensional Characterization of Planar Defects and Properties: *Pradeep Konda Gokuldoss*¹; Dierk Raabe¹; Sumantra Mandal¹; Stefan Zaefferer¹; ¹Max Planck Institute for Iron Research GmbH

4:40 PM Invited

Local Decomposition Induced by Dislocation Motions Inside Precipitates in an Al-alloy: *Xiu-Liang Ma*¹; ¹Institute of Metal Research, Chinese Academy of Sciences

5:10 PM

Atomic Scale Understanding of 6.8 GPa Ultra-high Strength Pearlite: *Yujiao Li*¹; Michael Herbig¹; Pyuck-Pa Choi¹; Christine Borchers²; Shoji Goto³; Dierk Raabe¹; Reiner Kirchheim²; ¹Max-Planck Institute for Iron Research; ²Georg-August-Universität Göttingen; ³Akita University

TUESDAY PM



Nanoparticulate Materials: Production, Consolidation and Characterization — Consolidation I: Field Assisted Sintering

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

Program Organizers: Brady Butler, U.S. Army Research Laboratory; Eugene Olevsky, San Diego State University

Tuesday PM
February 18, 2014

Room: Carlsbad
Location: San Diego Marriott Marquis & Marina

Session Chair: Eugene Olevsky, San Diego State University

2:00 PM Introductory Comments

2:10 PM Invited

Densification of Ductile Ceramic Nanoparticles by Spark Plasma Sintering: LiF, Y₂O₃ and YAG as Model Systems: *Rachman Chaim*¹; Rachel Marder¹; Claude Estournes²; Geoffroy Chevallier²; ¹Technion - Israel Institute of Technology; ²Université de Toulouse; UPS, INP

2:40 PM Invited

A Comparative Study of Liquid Phase Sintering vs Spark-plasma Sintering of Si₃N₄/SiC Nanocomposites: *Leon Shaw*¹; Jyothi Suri²; Yen-Shan Lin³; Eugene Olevsky³; ¹Illinois Institute of Technology; ²Intel Corporation; ³San Diego State University

3:10 PM

Flash Spark-plasma Sintering of Silicon Carbide: Further Developments: *Eugene Olevsky*¹; Steven Rolwing¹; Yen-Shan Lin¹; Andrey Maximenko¹; ¹San Diego State University

3:30 PM Break

3:50 PM

Improvements in the Spark Plasma Sintering of Magnesium Aluminate Spinel (MgAl₂O₄): *Gordon Alanko*¹; Darryl Butt¹; ¹Boise State University

4:10 PM

Spark Plasma Sintering of Zirconium Oxy-carbide: *Wei Li*¹; Oleg Izhvanov²; Jonas Opperman²; Christina Back²; Eugene Olevsky¹; ¹San Diego State University; ²General Atomics

4:30 PM

Thermal Processes during the Electrical Pulse Consolidation of Powders: *Evgeny Grigoryev*¹; Eugene Olevsky²; Elena Alexandrova¹; Alexandra Ilyina¹; Klementy Belyavin³; Oleg Kuznetchik⁴; Dmitry Minko³; ¹MEPHI; ²SDSU, MEPHI; ³BSTU; ⁴IPM NANB

4:50 PM

Spark Plasma Sintering of Annular Zirconium Carbide Powder Pellets: Processing and Simulation: *Xialu Wei*¹; Wei Li¹; Eugene Olevsky¹; Christina Back²; Oleg Izhvanov²; ¹San Diego State University; ²General Atomics

5:10 PM

Fe-Ti Compositions Consolidated by Spark Plasma Sintering and High Voltage Consolidation Technique: *Evgeny Grigoryev*¹; Eugene Olevsky²; Maria Yurlova¹; Olga Sizonenko³; Ekaterina Krikun¹; Alexander Novoselov¹; Andrey Zaychenko³; Andrey Torpakov³; ¹MEPHI; ²SDSU, MEPHI; ³IIP NANU

Nanostructured Materials for Rechargeable Batteries and Supercapacitors II — Session IV

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: David Millin, University of Alberta and NINT NRC; Reza Shahbazian-Yassar, Michigan Technological University; Peter Kallisvaart, University of Alberta and NINT NRC

Tuesday PM
February 18, 2014

Room: Ballroom F
Location: San Diego Marriott Marquis & Marina

Session Chairs: Leon Shaw, Illinois Institute of Technology; Xiaodong (Chris) Li, University of South Carolina

2:00 PM Invited

Improving Carbon Capacitance by Chemical/Electrochemical Attachment of Redox Molecules: *Thierry Brousse*¹; Estelle Lebègue²; Annaïg Le Comte³; Alban Morel¹; Olivier Crosnier¹; Gregory Pognon¹; Joël Gaubicher¹; Richard Retoux⁴; Daniel Bélanger³; Charles Cougnon²; Martin Weissmann¹; ¹IMN Univ Nantes/CNRS; ²Moltech Anjou; ³UQAM; ⁴CRISMAT

2:15 PM Invited

Chemical Functionalization of Carbon for Application in Electrochemical Capacitors: *Daniel Bélanger*¹; ¹Université du Québec à Montréal

2:30 PM Invited

Nanomaterials Design for Li-S Batteries: *Yi Cui*¹; ¹Stanford University

2:50 PM Invited

Flexible Textile Energy Storage from Cotton T-Shirts: *Xiaodong Li*¹; ¹University of Virginia

3:05 PM Invited

Finite-Element Modeling of the Electric Double-Layer and Its Application to the Prediction of Supercapacitor Charging Dynamics: *Vivek Shenoy*¹; ¹University of Pennsylvania

3:20 PM Invited

Atomic-scale Surface Engineering for Advanced Li-ion Batteries: *Sehee Lee*¹; ¹University of Colorado

3:35 PM Break

3:50 PM Invited

Atomic Layer Deposition for Synthesis of Anodes, Coatings on Electrodes and Solid-state Electrolytes Used in Li ion Batteries: *Jian Liu*¹; Xifei Li¹; Andrew Lushington¹; Ruying Li¹; *Andy Sun*¹; ¹The University of Western Ontario

4:05 PM Invited

Utilization of Elemental Sulfur for High Capacity Polymeric Electrodes in Li-S Batteries: *Jeffrey Pyun*¹; ¹University of Arizona

4:20 PM Invited

Crumpled Graphene Balls for Scalable Energy Applications: *Jiaxing Huang*¹; ¹Northwestern University

4:35 PM Invited

How To Use Nanostructured Materials Effectively in Rechargeable Lithium/Sulfur Battery: *Sheng Zhang*¹; ¹U.S. Army Research Laboratory

4:50 PM Invited

Porous Graphene-based Materials for Electrochemical Energy Storage: *George Zhao*¹; ¹The University of Queensland

5:05 PM Invited

Investigation of Li-ion Capacitors' Cycle Performance: *Jim Zheng*¹; Wanjun Cao¹; ¹Florida State University

5:20 PM Invited

Studies of Cathodes and Anodes for a New Generation of Na-ion Batteries: *Leon Shaw*¹; Monica Sawicki¹; Jack Shamie¹; ¹Illinois Institute of Technology

5:35 PM Invited

Structural Evolution of Li₂Fe(1-y)Mn(y)SiO₄ (y = 0, 0.2, 0.5, 1) and LiFeTiO₄ Cathode Materials for Li-ion Batteries upon Electrochemical Cycling: *Sylvio Indris*¹; ¹Karlsruhe Institute of Technology

Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World — Stressed Materials

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

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH; Brent Fultz, California Institute of Technology; Peter Liaw, The University of Tennessee

Tuesday PM
February 18, 2014

Room: 10
Location: San Diego Convention Center

Session Chairs: Mikhail Sokolov, ORNL; Leyun Wang, APS

2:00 PM Keynote

Slip Systems and Dislocation Densities from X-ray or Neutron Diffraction:

*Tamás Ungár*¹; ¹Eötvös University Budapest

2:40 PM Invited

Monitoring Precipitation in Severely Plastically Deformed Aluminum Alloys Using In Situ Small-angle X-ray Scattering: *Frederic De Geuser*¹; Seungwon Lee²; Zenji Horita²; Alexis Deschamps¹; ¹SIMAP - Grenoble INP - UJF - CNRS; ²Kyushu University

3:05 PM Invited

New Method for Elastic Strain and Stress Determination Using Spherical Harmonics Starting from the Voigt Model: *Davor Balzar*¹; Nicolae Popa²; Sven Vogel³; ¹University of Denver; ²National Institute of Materials Physics; ³Los Alamos National Laboratory

3:30 PM

Probing Deformation Mechanism of a New Class of Nanocomposite Materials by In Situ High Energy X-ray Diffraction: *Cun Yu*¹; Lishan Cui²; Shijie Hao²; Daqiang Jiang²; Xiaobin Shi²; Zhenyang Liu²; Dennis Brown¹; Yang Ren³; ¹NIU; ²China University of Petroleum, Beijing; ³Argonne National Laboratory

3:45 PM Break

4:00 PM Invited

Microbeam X-ray Measurements of the Full Elastic Strain Tensor from Individual Dislocation Cells in Copper-through-Si Vias: *Lyle Levine*¹; Chukwudi Okoro¹; Ruqing Xu²; ¹National Institute of Standards and Technology; ²Argonne National Laboratory

4:25 PM Invited

X-ray Diffraction Analysis Proofing Surface Sensitive Metallographic Sample Preparation: *Karen Pantleon*¹; ¹Technical University of Denmark

4:50 PM Invited

Real Instruments and Virtual Samples: Mesoscale Sampling by Neutron Diffraction in Polycrystalline Materials under Load: *Alexandru Stoica*¹; ¹ORNL

5:15 PM

Neutron Diffraction Study and EPSC Modeling of Multi-pass Tig Weld: *Shiv Sharma*¹; mark turski²; Mike Fitzpatrick³; Lyndon Edwards⁴; ¹Amity University Haryana; ²Magnesium Elektron; ³The Open University; ⁴ANSTO

Pb-free Solders and Emerging Interconnect and Packaging Materials — Electromigration and Flexible Packages

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch Automotivve

Tuesday PM
February 18, 2014

Room: 5B
Location: San Diego Convention Center

Session Chairs: Andre Lee, Michigan State University; Limin Ma, Beijing University of Technology

2:00 PM

Why Does an Electric Current Change the Stability of Solder?: *Shih-kang Lin*¹; Chao-kuei Yeh¹; Wei Xie²; Yu-chen Liu¹; Masahiro Yoshimura¹; ¹National Cheng Kung University; ²University of Wisconsin – Madison

2:20 PM

Improved Electromigration Resistance of Pb-free Solders by Using Cu/Sn Composite Structure: *Shih-Hsun Lin*¹; Fan-Yi Ouyang¹; ¹National Tsing Hua University

2:40 PM

Microstructure Refinement in Sn-Ag-Bi-In Solder by Adding SiC Nanoparticles to Reduce Electromigration under High Electric Current: *Youngeok Kim*¹; Shijo Nagao¹; Tohru Sugahara¹; Katsuaki Sugauma¹; Minoru Ueshima²; Hans-Juergen Albrecht³; Klaus Wilke³; Joerg Stogies³; ¹ISIR, Osaka University; ²Senju Metal Industry Co. LTD; ³Siemens AG, Corporate Technology

3:00 PM

Microstructure Evolution in Solder Bump Interconnects before and after Thermo-mechanical Cycling: *Tae-Kyu Lee*¹; Jason Zhou²; Thomas R. Bieler²; ¹Cisco Systems; ²Michigan State University

3:20 PM Break

3:40 PM

Flip Chip Process for Wearable Electronics Packaging: *Jung-Yeol Choi*¹; Dae-Woong Park¹; Kwang-Jae Shin¹; Tae-Sung Oh¹; ¹Hongik University

4:00 PM

Nanowire-based Pb-free Nanosolders for Next Generation Assembly and Interconnects: *Fan Gao*¹; Qiyue Yin²; Zhiyong Gu¹; Guangwen Zhou²; ¹University of Massachusetts Lowell; ²State University of New York at Binghamton

4:20 PM

Evaluation on Property and Reliability of Micro-bump Joint between Si Chip and Flexible Substrate: *Yong-Ho Ko*¹; Taek-Soo Kim²; Chang-Woo Lee¹; ¹Micro-Joining Center, Korea Institute of Industrial Technology, Incheon, ²KAIST



Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIII — Microelectronics Reliability I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Chao-hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikuo Ohnuma, Tohoku University; Clemens Schmetterer, Forschungszentrum Juelich, Inst.; Yee-Wen Yen, National Chung Cheng University; Shien Ping Feng, The University of Hong Kong; Shih-Kang Lin, National Cheng Kung University

Tuesday PM Room: 32A
February 18, 2014 Location: San Diego Convention Center

Session Chairs: Shien Ping Tony Feng, The University of Hong Kong; Jae-Ho Lee, Hongik University

2:00 PM Invited

Comparison of Electro and Electroless Nickel Iron Alloy Plating for the Diffusion Barrier of UBM: Ja-Kyung Koo¹; Myung-Won Jung¹; Sung Kang²; Jae-Ho Lee¹; ¹Hongik University; ²IBM Watson Research Center

2:20 PM

TEM Studies of Solid Phase Epitaxial Growth of 3C-SiC Thin Film on Si (001): Ramasis Goswami¹; Connie Li¹; Glenn Jernigan¹; C Hellberg¹; Berry Jonker¹; ¹Naval Research Laboratory

2:40 PM

Effect of Joint Thickness on Cu Consumption for Pb-free Solders under Current Stressing: Chung-Hsun Tsai¹; Fan-Yi Ouyang¹; ¹National Tsing Hua University

3:00 PM

Effects of Bath Conditions on the Compositions and Physical Properties of Ni-Fe Alloy Electroplating: Ju-Hwan Kim¹; TaiHong Yim²; Jae-Ho Lee¹; ¹Hongik University; ²Korea Institute of Industrial Technology

3:20 PM

The Crystallinity of Tin under Current Stressing: Yi-Han Liao¹; Kwang-Lung Lin¹; Albert Wu²; ¹Department of Materials Science and Engineering, National Cheng Kung University; ² Department of Chemical and Materials Engineering, National Central University

3:40 PM Break

3:50 PM Invited

Temperature Dependent Mechanical Testing on the Formation of Cu/Sn Intermetallic Thin Films: F.-C. Hsu¹; Fang-Jui Kuo¹; Y.-C. Cheng¹; Ming-Tzer Lin¹; ¹National Chung Hsing University

4:10 PM

Enhanced Diffusional Processes in Wire Bonding: Panthea Sephehrband¹; Jamie Mac¹; ¹Santa Clara University

4:30 PM

Electroplating of <111>-Oriented Nickel Using <111>-Orientated Nano-twinned Copper: Yi Cheng Chu¹; Chih Chen¹; ¹Department of Materials Science & Engineering, National Chiao Tung University

4:50 PM

Periodic Layer Formation in the Au-12Ge/Ni Diffusion Couple: Ming-yueh Tsai¹; Shih-kang Lin¹; ¹National Cheng Kung University

5:10 PM

Formation of Porous Cu₃Sn Intermetallic Compounds during Current Stressing at High Temperatures in Low-bump-height Solder Joints: Jie-An Lin¹; Chih Chen¹; ¹National Chiao Tung University

Phase Transformation and Microstructural Evolution — Multi-scale Modeling of Phase Transformations in Steels

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Tuesday PM Room: 31C
February 18, 2014 Location: San Diego Convention Center

Session Chairs: Hemantha Yeddu, Los Alamos National Laboratory; Carlos Capdevila Montes, National Center for Metallurgical Research (CENIM-CSIC)

2:00 PM Invited

A Detailed Study of the Transformation Stasis Phenomenon During the Isothermal Bainite Transformation in Mn based Low Alloy Steels: Sybrand Van Der Zwaag¹; Hao Chen¹; ¹Technical University Delft

2:30 PM Invited

Multi-scale Modeling of Phase Transformations in Steels: Matthias Militzer¹; Hao Jin¹; Morteza Tolouei¹; Benqiang Zhu¹; ¹The University of British Columbia

3:00 PM

A Molecular Dynamics Study of the Migration of Symmetric Grain Boundaries in a-Fe: Tegar Wicaksono¹; Chad Sinclair¹; Matthias Militzer¹; Jeffrey Hoyt²; H. Song²; ¹The University of British Columbia; ²McMaster University

3:20 PM Break

3:35 PM Invited

Characterization and Microstructure-based Modeling of a Grain Boundary Engineered Steel: Alexis Lewis¹; Amanda Levinson²; David Rowenhorst¹; ¹Naval Research Laboratory; ²National Research Council

4:05 PM

Virtual Cyclic Phase Transformation Dilatometer Experiments for Fe-Mn-C by Means of Phase Field Simulations: Markus Apel¹; Gottfried Laschet¹; Bernd Böttger²; ¹Access e. V.

4:25 PM Invited

Martensitic Transformations in Steels – A 3D Phase-field Study: Hemantha Yeddu¹; Turab Lookman¹; Avadh Saxena¹; ¹Los Alamos National Laboratory

4:55 PM

Phase Field Modelling of Microstructure Evolution in Dual Phase Steels: Benqiang Zhu¹; Matthias Militzer¹; ¹University of British Columbia

5:15 PM

Phase Field Modeling of Widmanstätten Structures: Maeva Cottura¹; Benoît Appolaire¹; Yann Le Bouar¹; Alphonse Finel¹; ¹LEM - ONERA/CNRS

Progress Towards Rational Materials Design in the Three Decades Since the Invention of the Embedded Atom Method: An MPMD Symposium in Honor of Dr. Michael I Baskes — Advances in Atomistic Simulations - II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS; Nanomechanical Materials Behavior Committee

Program Organizers: Srinivasan Srivilliputhur, University of North Texas; Amit Misra, Los Alamos National Laboratory; Neville Moody, Sandia National Laboratories; Stephen Foiles, Sandia National Laboratories; Mark Asta, University of California; Alan Needleman, University of North Texas

Tuesday PM
February 18, 2014

Room: 30E
Location: San Diego Convention Center

Session Chairs: Mark Asta, University of California, Berkeley; Irene Beyerlein, Los Alamos National Laboratory; W. Curtin, Brown University

2:00 PM Invited

Origin of Unrealistic Blunting during Atomistic Simulation of Crack Propagation Based on MEAM Potentials: *Byeong-Joo Lee*¹; ¹Pohang University of Science and Technology

2:20 PM Invited

On the Interaction of Radiation-induced Defects with Grain Boundaries in Cu: *Blas Uberuaga*¹; ¹Los Alamos National Laboratory

2:40 PM

Correlating Microstructure and Ductile Fracture Toughness: Shmulik Osovski¹; Ankit Srivastava¹; *Alan Needleman*¹; James Williams¹; ¹University of North Texas

3:00 PM Invited

Radiation-induced Super-quenching and Plasticity in Metallic Glasses: *Michael Demkowicz*¹; Richard Baumer¹; ¹Massachusetts Institute of Technology

3:20 PM Break

3:30 PM Invited

Hydrogen Interactions with Uranium: A Thermal Desorption Study: *Scott Lillard*¹; ¹University of Akron

3:50 PM Invited

Large-scale EAM Simulation Studies of Shock-induced Plasticity and Phase Transformations in fcc and bcc Metals: *Timothy Germann*¹; ¹Los Alamos National Laboratory

4:10 PM

Bonding of Metallic Nanoparticles: *Michael Chandross*¹; Timothy Boyle¹; Ping Lu¹; ¹Sandia National Laboratories

4:30 PM

Plasticity and Phase Transition in Shocked Fe: *Eduardo Bringa*¹; ¹CONICET - Universidad Nacional de Cuyo

4:50 PM Invited

Energetically-driven Approach for Evaluating Hydrogen Enhanced Localized Plasticity Versus Hydrogen Enhanced Decohesion Mechanisms in Iron: M. Bhatia¹; I. Adlakha¹; *Kiran Solanki*¹; M. Tschopp¹; ¹Arizona State University

5:10 PM Invited

Atomistic Modeling of Radiation Damage in bcc Uranium: *Chaitanya Deo*¹; Benjamin Beeler¹; Maria Okuniewski²; Michael Baskes³; ¹Georgia Institute of Technology; ²Idaho National Laboratory; ³University of California, San Diego

Rare Metal Extraction & Processing Symposium — Titanium, Lithium, Yttrium, and Zirconium

Sponsored by: Associação Brasileira de Metalurgia, Materiais e Mineração – ABM, Chinese Society for Metals, Metallurgy and Materials Society of CIM, Institute of Materials, Minerals and Mining, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Neale Neelameggham, Ind LLC; Shafiq Alam, Memorial University of Newfoundland; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto, Kennecott Utah Copper Refinery

Tuesday PM
February 18, 2014

Room: 16B
Location: San Diego Convention Center

Session Chairs: M. Ashraf Imam, Naval Research Laboratory; Zak Fang, University of Utah

2:00 PM Introductory Comments

2:05 PM

A Clean Titanium Sponge Production Process and New Method for the Recycling of Magnesium and Chlorine: Niu Liping¹; Zhou Aiping¹; *Zhang Ting'an*¹; Wang Wenbo¹; Lv Guozhi¹; Jiang Xiaoli¹; ¹Northeastern University

2:25 PM

Chemical Characterization of Transition Metal (V, Zr, Nb) Impurities in Rutile: *Terence Makanyire*¹; Animesh Jha¹; ¹University of Leeds

2:45 PM

Pre-oxidation and Hydrogen Reduction of Panzhihua Ilmenite Concentrate: *Wei Xiao*¹; Xionggang Lu¹; Weizhong Ding¹; Chonghe Li¹; Xingli Zou¹; ¹Shanghai University

3:05 PM

Thermodynamic Properties of Different Titanium Ions in Fused LiCl-KCl Eutectic: *Song Jianxun*¹; Wang Qiuyu¹; Zhu Xiaobo¹; Hou Jungang¹; Jiao Shuqiang¹; Zhu Hongmin¹; ¹University of Science and Technology Beijing

3:25 PM Break

3:45 PM

Silicon-thermic Reduction of Complex Lithium Aluminate under Vacuum: *Di Yuezhong*¹; Pan Xijuan¹; Peng Jianping¹; Wang Yaowu¹; Feng Naixiang¹; ¹Northeastern University

4:05 PM

Extraction of Yttrium from Ferruginous Sandstone, Southwestern Sinai, Egypt: Omneya El Hussaini¹; Hassan Salman²; *Mahmoud Mahmoud*¹; ¹Nuclear Materials Authority; ²South Valley University

4:25 PM

Sublimation Kinetics of Zirconium Tetrachloride (ZrCl₄) for Producing Zr Sponge: *Jaehong Shin*¹; Misun Choi²; Dongjoon Min³; Joohyun Park¹; ¹Hanyang University; ²Research Institute of Industrial Science and Technology (RIST); ³Yonsei University

Solid-state Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment — Oxides and Nanostructures I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Xiang-Yang Liu, Los Alamos National Laboratory; Blas Uberuaga, Los Alamos National Lab; Stephen Foiles, Sandia National Laboratories; Mitra Taheri, Drexel University; Rampi Ramprasad, University of Connecticut

Tuesday PM
February 18, 2014

Room: 4
Location: San Diego Convention Center

Session Chair: Blas Uberuaga, Los Alamos National Laboratory

2:00 PM Invited

Helium Storage in Oxides and at Oxide-iron Interfaces from First-principles: *Paul Erhart*¹; ¹Chalmers University of Technology, Gothenburg, Sweden



2:40 PM

Atomic Scale Characterization of Ion Irradiated Heterogeneous Ceramic Oxide Interfaces: *Jeffery Aguiar*¹; Pratik Dholabhai¹; Miaofang Chi²; Yongqiang Wang¹; Zhenxing Bi¹; Quanxi Jia¹; Engang Fu¹; Amit Misra¹; Blas Uberuaga¹; ¹Los Alamos National Laboratory; ²Oak Ridge National Laboratory

3:00 PM

Characterizing Complex Metal-oxide Interfaces via Virtual Diffraction: *Shawn Coleman*¹; Christopher Weinberger²; Douglas Spearot¹; ¹University of Arkansas; ²Drexel University

3:20 PM

Fabrication and Characterization of Oriented Fe-Y₂Ti₂O₇ Interfaces: Implications to the Development and Optimization of Nanostructured Ferritic Alloys: *Tiberiu Stan*¹; Yuan Wu¹; George R. Odette¹; Peter Hosemann²; Richard Kurtz³; ¹University of California Santa Barbara; ²University of California Berkeley; ³Pacific Northwest National Laboratory

3:40 PM Break

3:50 PM

Atomic Modeling of Asymmetric Tilt Grain Boundaries in SrTiO₃: *Hak-Sung Lee*¹; Teruyasu Mizoguchi²; Yuichi Ikuhara²; ¹Korea Institute of Materials Science; ²The University of Tokyo

4:10 PM

Effects of GB Crystallography and Mobility on Microstructural Evolution of d-UO₂+x during the Final Sintering Stage: *Karin Rudman*¹; Harn Chyi Lim¹; Robert McDonald¹; Pedro Peralta¹; Darrin Bayler²; Chris Stanek²; Kenneth McCellan²; ¹Arizona State University; ²Los Alamos National Laboratory

4:30 PM

Microstructurally Explicit Study of Transport Phenomena in Uranium Oxide: *Harn Chyi Lim*¹; Karin Rudman¹; Robert McDonald¹; Pedro Peralta¹; Patricia Dickerson²; Darrin Byler²; Kenneth McClellan²; ¹Arizona State University; ²Los Alamos National Laboratory

4:50 PM

The Role of the Transition Metal Dopants in Hydrogen Pickup Kinetics at the Zirconium Oxide – Water Interface: A Density Functional Theory Study: *Mostafa Youssef*¹; Bilge Yildiz¹; ¹Massachusetts Institute of Technology

5:10 PM

Nucleation and Atomic Layer Reaction in Nickel Silicide for Defect-engineered Si Nanochannels: *Wei Tang*¹; Tom Picraux²; Andriy Gusak³; King-Ning Tu⁴; Shadi Dayeh⁵; ¹University of California, Los Angeles; ²Los Alamos National Lab; ³Cherkasy National University; ⁴University California, Los Angeles; ⁵University of California, San Diego

Ultrafine Grained Materials VIII — Young Scientist II: Microstructural Evolution

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Lavernia, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Tuesday PM

Room: 6E

February 18, 2014

Location: San Diego Convention Center

Session Chairs: Terry Lowe, Colorado School of Mines; Yuntian Zhu, North Carolina State University

2:00 PM

Precipitation Phenomena in Gas Atomized and Cryomilled Al-Fe Alloys: *Brandon Saller*¹; Troy Topping¹; Kaka Ma¹; Enrique Lavernia¹; Julie Schoenung¹; ¹UC Davis

2:15 PM

Formation of Supersaturated Solid Solutions in Immiscible Systems by High-pressure Torsion: *Karoline Kormout*¹; Andrea Bachmaier²; Bo Yang¹;

Jozef Keckes³; Reinhard Pippan⁴; ¹Erich Schmid Institute of Materials Science, Austrian Academy of Sciences; ²Materials Science and Methods, Saarland University; ³Department Materials Physics, University of Leoben; ⁴Erich Schmid Institute of Materials Science

2:30 PM

Influence of Length Scale on Precipitation in Ultrafine-grained and Nanocrystalline Al-Zn-Mg-Cu Alloys (Al 7075): *Haiming Wen*¹; Kaka Ma¹; Dieter Isheim²; David Seidman²; Julie Schoenung¹; Enrique Lavernia¹; ¹University of California, Davis; ²Northwestern University

2:45 PM

Investigation of Abnormal Grain Growth Kinetics in Electrodeposited Nanostructured-nickel: *William Frazier*¹; Anthony Rollett¹; Gregory Rohrer¹; ¹Carnegie Mellon University

3:00 PM

Microstructural Evolution in Pure Titanium Processed by High-pressure Torsion: *Mahmood Shirooyeh*¹; Jie Xu²; Terence Langdon¹; ¹University of Southern California; ²Harbin Institute of Technology

3:15 PM

Optimizing Strength and Ductility in Cu-Al Alloy with Fine and Homogeneous Recrystallized Structure by Simple Cold Rolling and Annealing: *Yanzhong Tian*¹; Daisuke Terada¹; Akinobu Shibata¹; Nobuhiro Tsuji¹; ¹Kyoto University

3:30 PM Break

3:45 PM

Precipitation Mechanisms Induced by Severe Plastic Deformation in Al-Cu Alloy: *Yana Nasedkina*¹; Xavier Sauvage¹; Maxim Murashkin²; Nariman Enikeev²; Ruslan Valiev²; ¹Universite de Rouen; ²Ufa State Aviation Technical University

4:00 PM

Thermal Stability and Microstructural Evolution in Severe Plastically Deformed Fe and Fe-Zr: *Kate Dillione*¹; Christopher Barr²; Mitra Taheri²; ¹Materials Engineering, Brown University; ²Materials Science and Engineering, Drexel University

4:15 PM

Effect of Microstructure on Nitriding of Ultrafine-grained Titanium Processed by High-pressure Torsion: *Chuan Wang*¹; Terence Langdon¹; ¹University of Southern California

4:30 PM

Microstructure Stability of Ultra-fine Grained Commercial Magnesium Alloy Processed by Severe Plastic Deformation: *Jitka Stráská*¹; Miloš Janeček¹; ¹Charles University in Prague

4:45 PM

Nano-structuring of 316L Austenitic Steel by High-strain rate Severe Plastic Deformation Processing: *Jorg Wiezorek*¹; Andreas Kulovits²; Yaakov Idell¹; Giovanni Facco¹; ¹University of Pittsburgh; ²Carnegie Mellon University

5:00 PM

TEM and X-ray Analysis of Cu-alloys after High Pressure Torsion: *Daria Shangina*¹; Jeno Gubicza²; Erzsebet Dodony²; Natalia Bochar¹; Natalia Tabachkova³; Sergey Dobatkin¹; ¹A.A.Baikov Institute of Metallurgy and Materials Science, Russian Academy of Sciences; ²Eotvos Lorand University; ³National University of Science and Technology "MISIS"

5:15 PM

The Effect of Combined SPD Processes on Mechanical Behavior and Microstructural Properties of an Aluminum Alloy: *Shima Sabbaghianrad*¹; Terence Langdon¹; ¹University of Southern California

2014 Functional Nanomaterials: Synthesis, Properties and Applications — Carbon Nanomaterials II & Computational Studies on Nanomaterials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Wednesday AM
February 19, 2014

Room: Ballroom D
Location: San Diego Marriott Marquis & Marina

Session Chairs: Yuanbing Mao, University of Texas - Pan American; Ramki Kalyanaraman, University of Tennessee; Nitin Chopra, The University of Alabama

8:30 AM Invited

Microwave Irradiation Enables Rapid and Direct Dispersion of Highly Conductive Carbon Nanomaterials: *Huixin He*¹; ¹Rutgers University

9:00 AM

Controlling Oxidative Cutting for Graphene Nanosheets or Graphene QDs: *Huixin He*¹; ¹Rutgers University

9:20 AM

Interaction of Graphite with Molten Salts to Form Novel Structures: Ali Kamali¹; *Derek Fray*¹; ¹University of Cambridge

9:40 AM Invited

Effective Thermal Transport Properties of Multifunctional Nanocomposite Materials: *V. U. Unnikrishnan*¹; ¹The University of Alabama

10:10 AM Break

10:30 AM

High Strength, High Conductivity of Wire-drawn Cu-Ag Nanometric Filamentary Composites: *Artur Kawecki*¹; *Tadeusz Knych*¹; *Eliza Sieja-Smaga*¹; *Andrzej Mamala*¹; *Pawel Kwasniewski*¹; *Grzegorz Kiesiewicz*¹; ¹AGH University of Science and Technology

10:50 AM Invited

Extending Bulk CALPHAD Methods to Interfaces and Nanomaterials to Help Decipher the “Materials Genome”: *Jian Luo*¹; *Naixie Zhou*¹; ¹UC San Diego

11:20 AM

Computational Study of the Directed Self-assembly of Porous Thin-film Membranes with Colloidal Particle Coated Channels: *Paul Millett*¹; ¹University of Arkansas

11:40 AM

Reactive Molecular Dynamics Simulations of Switching in Conductive Bridge Random Access Memory: *Nicolas Onofrio*¹; *David Guzman*¹; *Alejandro Strachan*¹; ¹Purdue University

2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications — Nanometals II-Processing and Strengthening Mechanisms

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Nugehalli Ravindra, New Jersey Institute of Technology; Ramki Kalyanaraman, University of Tennessee; Haiyan Wang, Texas A&M University; Yuntian Zhu, North Carolina State University; Justin Schwartz, North Carolina State University; Amit Goyal, Oak Ridge National Laboratories

Wednesday AM
February 19, 2014

Room: Ballroom E
Location: San Diego Marriott Marquis & Marina

Session Chairs: Evan Ma, Johns Hopkins University; Suveen Mathaudhu

8:30 AM Invited

Superior Strength in Bulk Nanostructured Metallic Materials Produced by SPD Processing: *Ruslan Valiev*¹; *Nariman Enekeev*¹; *Sergei Firstov*²; ¹Ufa State Aviation Technical University; ²Frantsevich Institute for Problems of Materials Science

8:50 AM

Dynamic Strain Aging in Ultrafine Grained Titanium: *Felipe Lopes*¹; *Sergio Monteiro*¹; *Daniel Fernandes*¹; *Carlos Elias*¹; *Chia-Hui Lu*²; *Ruslan Valiev*³; *Marc Meyers*²; ¹IME; ²UC San Diego; ³Ufa State Aviation Technical University

9:10 AM Invited

Generation of Bulk Nanocomposites and Supersaturated Solid Solutions by Severe Plastic Deformation: *Andrea Bachmaier*¹; *Anton Hohenwarter*²; *Reinhard Pippan*³; ¹Saarland University; ²University of Leoben; ³Austrian Academy of Sciences

9:30 AM Invited

Crystallization of Metallic Glasses to Produce Nanostructured Materials: *Ken Kelton*¹; ¹Washington University

9:50 AM Break

10:10 AM Invited

Industrially Useful Nanostructured Molybdenum Alloys with Unprecedented Tensile Ductility: *Evan Ma*¹; ¹Johns Hopkins University

10:30 AM Invited

High-strength Low-alloyed Zinc Processed by High-pressure Torsion: *Javier Gil Sevillano*¹; *Tobias Zühlke*¹; *Jon Iglesias Erasquin*¹; *Jon Alkorta*¹; *Heinz Werner Höppel*²; *Mathias Göken*²; ¹CEIT and TECNUN, University of Navarra; ²University of Erlangen-Nuremberg

10:50 AM Invited

Finding Strength in Our Faults: Extreme Strengthening of Mg-alloys via Nano-spaced Stacking Faults: *Weiwei Jian*¹; *Weizhong Xu*¹; *Hao Yuan*¹; *Ming-Hung Tsai*¹; *Carl Koch*¹; *Yuntian Zhu*¹; *Suveen Mathaudhu*²; ¹North Carolina State University; ²U.S. Army Research Office

11:10 AM Invited

Microstructural and Geometrical Size Scale Effects in Shape Memory Alloys: *Raj Vaidyanathan*¹; ¹UCF

11:30 AM

Grain Size Effect on Deformation Physics of Nanostructured Materials: *Yuntian Zhu*¹; *Guangming Cheng*¹; *Xiaozhou Liao*²; *Xiaolei Wu*³; ¹North Carolina State University; ²University of Sydney; ³Chinese Academy of Sciences



5th International Symposium on High Temperature Metallurgical Processing — Sintering of Ores and Powder

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

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Mark Schlesinger, Missouri University of Science and Technology; Onuralp Yücel, ITU; Rafael Padilla, University of Concepcion; Phillip Mackey, P.J. Mackey Technology; Guifeng Zhou, Wuhan Iron and Steel

Wednesday AM Room: 18
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Guanghui Li, Central South University; Xuewei Lv, Chongqing University

8:30 AM Introductory Comments

8:35 AM Invited

Microwave Sintering of Pressurized Ceramics: *M. Ashraf Imam*¹; Arne Fliflet¹; Benjamin Rock¹; ¹Naval Research Laboratory

8:50 AM

Microscopic Mechanisms of Spark Plasma Sintering in a TiAl Alloy: *Zofia Trzaska*¹; Alain Couret¹; Jean-Philippe Monchoux¹; ¹CEMES/CNRS

9:05 AM

Effects of Fuel's Distribution on NOx Emissions in Iron Ore Sintering: Xiaohui Fan¹; Wei Lv¹; Min Gan¹; Xuling Chen¹; Zhiyuan Yu¹; Jian Wang¹; Yang Zhou¹; Qiang Chen¹; ¹Central South University

9:20 AM

Study on the Metallurgical Performances of Typical Manganese Ores: *Yuanbo Zhang*¹; Yongjian Zhang¹; Zhixiong You¹; Yi Zhao¹; Guanghui Li¹; Tao Jiang¹; ¹Central South University

9:35 AM

Comprehensive Emission Reduction of Sintering Exhaust Gas Pollutant with Addition of Urea: *Hongming Long*¹; ¹Anhui University of Technology

9:50 AM

Fabrication of Al-Si Alloys by Microwave Sintering: *Lei Xu*¹; Mi Yan¹; Yi Xia¹; Jinhui Peng¹; Wei Li¹; Libo Zhang¹; Chenhui Liu¹; Yun Li¹; ¹Kunming University of Science and Technology

10:05 AM Break

10:15 AM

Influence of Limestone Types on Iron Ore Sintering: Xuling Chen¹; *Qiang Chen*¹; Min Gan¹; Xiaohui Fan¹; Zhiyuan Yu¹; Zhiyun Ji¹; Jian Wang¹; Yang Zhou¹; ¹Central South University

10:30 AM

Effect of Aluminum Oxide on Compressive Strength of Pellets and its Mechanism Analysis: Zhang jianliang¹; *Wang zhenyang*¹; Xing xiangdong¹; Liu zhengjian¹; ¹University of Science and Technology Beijing

10:45 AM

Process Optimization of Removing Chlorine of Zinc Dross Using Microwave Roasting: *Lu Shuaidan*¹; ¹School of Materials and Metallurgy, Northeastern University

11:00 AM

Physico-chemical Properties and Sintering Performance of Canadian Iron Concentrate: Jian Pan¹; Benjing Shi¹; *Deqing Zhu*¹; Xiaobo Li¹; ¹Central South University

11:15 AM

Study of Pre-granulation for High Proportion Iron Ore Concentrate Sintering: Xuling Chen¹; Jian Wang¹; Xiaohui Fan¹; Min Gan¹; Yang Zhou¹; Wei Lv¹; Qiang Chen¹; Zhiyuan Yu¹; ¹Central South University

11:30 AM

The Influence of Al₂O₃ Content on Sinter Softening and Melting Properties: *Fanyi Meng*¹; Zhe Wang¹; Jianliang Zhang¹; ¹University of Science and Technology of Beijing

11:45 AM

Influence of B₂O₃ on Phases and Metallurgical Properties of High Ti-bearing Vanadium-titanomagnetite Sinter: *Shan Ren*¹; Jianliang Zhang¹; Xiangdong Xing¹; Zhe Wang¹; Bingji Yan¹; Kexin Jiao¹; ¹University of Science and Technology Beijing

A Lifetime of Experience with Titanium Alloys: An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer — Boyer Honorary Session I: Environmental Effects

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Adam Pilchak, Air Force Research Laboratory; James Larsen, Air Force Research Laboratory; David Dye, Imperial College London; Jay Tiley, Air Force Research Laboratory

Wednesday AM Room: 1A
February 19, 2014 Location: San Diego Convention Center

Session Chairs: James Colton, Boeing; Jaimie Tiley, Air Force Research Laboratory

8:30 AM Invited

The Effect of Hydrogen on the Fracture Toughness of Ti-5Mo-5V-5Al-3Cr: *James Cotton*¹; David Bryan²; Thomas Bayha²; Peter Hellenbrand¹; Michael Leder³; Igor Levin³; ¹Boeing; ²ATI Allvac; ³VSMPO-AVISMA

9:00 AM

Stress Corrosion Cracking Threshold of Ti 6-4 Extrusions: *Robert Briggs*¹; ¹Boeing

9:20 AM

An Atom per Square Mile: On the Mechanisms of Stress Corrosion Cracking in Titanium: *Adam Pilchak*¹; James Williams²; ¹Air Force Research Laboratory; ²The Ohio State University

9:40 AM

Protection of Ti-alloys against High Temperature Environmental Attack by a Two Step Process, Aluminization + Fluorination: *Alexander Donchev*¹; Michael Schütze¹; Mathias Galetz¹; Rossen Yankov²; Andreas Kolitsch²; ¹DFI; ²HZDR

10:00 AM Break

10:15 AM Invited

Microstructural and Environmental Effects on Very High Cycle Fatigue Crack Formation in Ti-6242: *Jason Geathers*¹; Chris Torbet²; J. Wayne Jones¹; Samantha Daly¹; ¹University of Michigan; ²University of California-Santa Barbara

10:35 AM

Environmentally Assisted Crack Nucleation in Ti-6246: *Tamara Chapman*¹; Richard Chater¹; Adrian Walker²; Trevor Lindley¹; David Dye¹; ¹Imperial College London; ²Rolls-Royce plc

10:55 AM

Welding of Ti-6Al-4V in Air: Carsten Schwandt¹; Chris Allen²; *Derek Fray*¹; ¹University of Cambridge; ²TWI Ltd

11:15 AM

Joining Characteristics of ATI 425 Alloy- Microstructural and Mechanical Property Developments: *Luis Ruiz-Aparicio*¹; ¹ATI Aerospace

11:35 AM

Understanding the Effect of Impurities (O, C, Fe, Cl and P) on the Microstructural Development of Powder Metallurgy Titanium and Titanium Alloys: *Ma Qian*¹; Ming Yan; ¹The University of Queensland

11:55 AM

Vacuum and Color Etching for Titanium Alloys: *Olga Sergienko*¹; ¹Zaporozhye National Technical University

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling — Irradiation Studies in Reactors

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

Program Organizers: Peter Hosemann, University of California Berkeley; Julie Tucker, Knolls Atomic Power Laboratory; James Cole, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Wednesday AM
February 19, 2014

Room: 32B
Location: San Diego Convention Center

Session Chair: Peter Hosemann, University of California Berkeley

8:30 AM

Irradiation Effects in Aged Cast Duplex Stainless Steels: *Yong Yang*¹; Yiren Chen²; Janne Pakarinen³; ¹University of Florida; ²Argonne National Laboratory; ³University of Wisconsin-Madison

9:10 AM

Microstructural Characterization of Test Reactor Irradiated RPV Steels by Post-irradiation Annealing and State-of-the-art Characterization Tools: *Takuya Yamamoto*¹; Takeshi Toyama²; Peter Wells¹; Yasuyoshi Nagai²; G. Robert Odette¹; ¹University of California Santa Barbara; ²Tohoku University

9:30 AM

Grain Boundary Structure Effects on Radiation Induced Segregation in Neutron Irradiated Type 304 Stainless Steels Variants: *Kevin Field*¹; Lizhen Tan¹; Jeremy Busby¹; ¹Oak Ridge National Laboratory

9:50 AM

Grain Orientation Dependence of Deformation Twinning in Irradiated and Nonirradiated Austenitic Stainless Steels: *Thak Sang Byun*¹; Maxim Gussev¹; Kevin Field¹; Jeremy Busby¹; ¹Oak Ridge National Laboratory

10:10 AM Break

10:30 AM

On the Opportunities and Challenges for Using Test Reactor and Charged Particle Irradiations to Help Predict Inaccessible In-service Neutron Irradiations Effects: *G. Robert Odette*¹; Takuya Yamamoto¹; Peter Wells¹; Peter Hosemann²; ¹University of California Santa Barbara; ²University of California Berkeley

11:10 AM

Microstructure and Mechanical Property Studies on Neutron-irradiated Ferritic FeCr Model Alloys: *Wei-Ying Chen*¹; Yinbin Miao¹; Carolyn Tomchik¹; Kun Mo¹; Jian Gan²; Maria Okuniewski²; Y.Q. Wu³; Stuart Maloy⁴; James Stubbins¹; ¹U of Illinois at Champaign-Urbana; ²Idaho National Laboratory; ³Boise State University; ⁴Los Alamos National Laboratory

11:30 AM

Helium Behaviour in Ferritic/Martensitic Steels Irradiated in a Spallation Target and Implanted with Helium: *Vladimir Krsjak*¹; Veronika Sabelova²; Christiane Vieh¹; Yong Dai¹; ¹Paul Scherrer Institut; ²Slovak University of Technology

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Strain and Plasticity II

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Materials Characterization Committee, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Khalid Hattar, Sandia National Laboratories; Marko Knezevic, University of New Hampshire; Irene Beyerlein, Los Alamos National Laboratory

Wednesday AM
February 19, 2014

Room: 8
Location: San Diego Convention Center

Session Chairs: Tom Bieler, Michigan State; Khalid Hattar, Sandia National Laboratory

8:30 AM Invited

Local Elastic Strain and Strain Tensor Measurements of Deformed Metals Using Focused, Sub-micrometer X rays: *Lyle Levine*¹; I-Fang Lee²; Thien Phan²; Chukwudi Okoro¹; Ruqing Xu³; Jon Tischler³; Wenjun Liu³; Michael Kassner²; ¹National Institute of Standards and Technology; ²University of Southern California; ³Argonne National Laboratory

9:00 AM Invited

Strain Mapping at Multiple Length Scales: Experimentally Validated Predictive Modelling: *Brian Abbey*¹; ¹Worcester Polytechnic Institute

9:30 AM Invited

Using High Energy X-ray Diffraction and a Crystal-based Finite Element Model to Understand Fatigue Crack Initiation: *Matthew Miller*¹; Paul Dawson¹; Mark Obstalecki¹; Su Leen Wong¹; ¹Cornell University

10:00 AM Break

10:20 AM

Use of High Energy Diffraction Microscopy to Study the Elasto-plastic Transition and Stress Relaxation: *Armand Beaudoin*¹; Wenli Tang¹; Margaret Koker²; Ulrich Lienert³; Peter Kenesei⁴; ¹University of Illinois at Urbana-Champaign; ²Cornell University; ³Deutsch Elektronen Synchrotron DESY; ⁴Argonne National Laboratory

10:40 AM

Coupling of Electron Channelling Contrast Imaging with EBSD: New Perspectives into the Characterization of Deformation Structures in the SEM: *Ivan Gutierrez-Urrutia*¹; Dierk Raabe¹; ¹Max-Planck-Institut for Iron Research

11:00 AM

Characterization of the Deformation Mechanisms in Fe-Mn Austenitic Steels Using Aberration-corrected Transmission Electron Microscopy: *James Wittig*¹; Dean Pierce¹; Linda Mosecker²; Maryam Beigmohamadi³; Joachim Mayer⁴; ¹Vanderbilt University; ²Institute for Eisenhüttenkunde, RWTH University; ³Gemeinschaftslabor für Elektronenmikroskopie, RWTH University; ⁴Ernst Ruska Center

11:20 AM

Slip and Orientation Change during In Situ Testing of Micro-tensile Samples of BCC Fe: *Dhriti Bhattacharyya*¹; Robert Wheeler²; Robert Harrison¹; Lyndon Edwards¹; ¹ANSTO; ²Micro Testing Solutions LLC



Advances in Surface Engineering: Alloyed and Composite Coatings III — Joint Session I: Recent Developments in Biological, Electronic, and Functional Thin Films and Coatings

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee

Program Organizers: Sandip Harimkar, Oklahoma State University; Jeff De Hosson, Univ of Groningen; Roger Narayan, University of North Carolina and North Carolina State University; Efstathios (Stathis) Meletis, University of Texas at Arlington; Virendra Singh, Schlumberger Rosharon Campus; Srinivasa Bakshi, Indian Institute of Technology-Madras; Mathieu Brochu, McGill University; Arvind Agarwal, Florida International University; Jian Luo, UC San Diego; Nancy Michael, University of Texas at Arlington; Nuggehalli Ravindra, New Jersey Institute of Technology; Adele Carradó, IPCMS; Choong-un Kim, University of Texas at Arlington; Amit Pandey, Rolls Royce LG Fuel Cell

Wednesday AM Room: 1B
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Roger Narayan, University of North Carolina and North Carolina State University; Sandip Harimkar, Oklahoma State University

8:30 AM Invited

Development of Titanium/Polymer Systems for Biomedical Applications: Heinz Palkowski¹; Mohamed Harharsh²; Genevieve Pourroy³; Patrick Masson³; Pierre Lutz⁴; Adele Carradó³; ¹Clausthal University of Technology; ²Clausthal University of Technology; ³IPCMS, UMR 7504 UDS-CNRS; ⁴ICS UPR22-CNRS

8:55 AM

Mechanical and Microstructural Evaluation of Laser Assisted Cold Sprayed Coatings for Potential Use in Biomedical Applications: Monnamme Tlotleng¹; Mukul Shuklar²; Esther Akinlabi³; Sisa Pityana¹; ¹Council for Scientific and Industrial Research; ²Motilal Nehru National Institute of Technology Allahabad; ³University of Johannesburg

9:10 AM

Blood-compatibility Characteristics for Biocompatible Artificial Lungs: Narayana Garimella¹; ¹University of Maryland Baltimore

9:25 AM

Study of the Extent of Denaturation in Electrospun Collagen: Amir Hossein Rajabi Zamani¹; Eric Winters¹; George Collins¹; Treena Livingston Arinze¹; Michael Jaffe¹; ¹New Jersey Institute of Technology

9:40 AM

Stiffness Graded Titanium Obtained by Laser Surface Alloying: Lisiane Carvalho¹; Adilson Rodrigues¹; Milton Lima²; João Fogagnolo¹; ¹University of Campinas; ²Instituto de Estudos Avançados

9:55 AM

Mechanical Characterization of Anodic Zirconium Oxide Nanotubular Arrays on Zirconium: Luning Wang¹; Ming Jin¹; Zhou Yang¹; Jingli Luo²; ¹University of Science and Technology Beijing; ²University of Alberta

10:10 AM Break

10:20 AM Invited

Enhancing the Toughness of Ceramic-based Multilayer Coatings by Introducing Polymer Interface: Xi-Ming Yang¹; Tsung-Hao Hsu¹; Yu-Chen Chan¹; Chang-Yu Sun¹; Jenq-Gong Duh¹; Po-Yu Chen¹; ¹National Tsing Hua University

10:45 AM

Double Layer Multifunctional Zn-Ni-P Coatings for Anticorrosive Applications: Ionut Constantin¹; Vasile Soare¹; Marian Burada¹; Dumitru Mitrica¹; Daniela Dumitrescu¹; Petru Moldovan²; Ana-Maria Popescu³; ¹National R&D Institute for Nonferrous and Rare Metals; ²Polytechnic University of Bucharest; ³Institute of Physical Chemistry

11:00 AM

Characterization of Graphite Coatings Produced by CoBlast™ Technology: Atinuke Oladoye¹; James Carton²; Abdul Olabi³; ¹Dublin City University; ²EnBio Ltd.; ³University of the West of Scotland

11:15 AM

Analysis of Corrosion Resistant Laser Assisted Cold Sprayed Titanium Coatings: Effects of Process Parameters: Eyitayo Olakanmi¹; Monnamme Tlotleng²; Tebogo Mathebula²; Khoro Malabi²; Herman Burger²; Mulalo Doyoyo¹; ¹University of Johannesburg; ²Council for Scientific and Industrial Research

11:30 AM

Research on Modification of Anti-oxidation Coating for Steel Billet: Chen Sheng¹; ¹Wuhan Iron and Steel Co.

11:45 AM

Nanotubes Growth on Titanium Based Alloys for Biomedical Applications: Ana Paula Rosifini Alves Claro¹; Ana Lúcia Escada¹; Patricia Capellato¹; Andre Luis Seixas Rangel¹; ¹UNESP

Algorithm Development in Computational Materials Science and Engineering — Algorithms for General Materials Modeling and Integrating Experiments: Part I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee

Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas; Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, Army Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology

Wednesday AM Room: 31B
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Mohsen Asle Zaeem, Missouri University of Science and Technology; Terry Delph, Lehigh University

8:30 AM Invited

Calculating Wear Coefficients from Microscale Simulations: Michael Demkowicz¹; Areg Hayrapetian¹; ¹Massachusetts Institute of Technology

9:10 AM

GPU Simulations of Fracture in Bioinspired Brick and Mortar Composites: John Pro¹; Matt Begley¹; Linda Petzold¹; Marcel Utz²; Rone Lim¹; ¹University of California, Santa Barbara; ²University of Southampton

9:30 AM

Defect Nucleation in Crystals: Terry Delph¹; Jonathan Zimmerman²; Harold Park³; ¹Lehigh University; ²Sandia National Laboratory; ³Boston University

9:50 AM

Diffuse Interface Field Approach to Modeling and Simulation of Packing of Arbitrarily Shaped Particles with Friction: Fengde Ma¹; Yu Wang¹; ¹Michigan Technological University

10:10 AM Break

10:30 AM

Automatic Differentiation for Numerically Exact Computation of Tangent Operators in Small- and Large-deformation Computational Inelasticity: Qiushi Chen¹; Jakob Ostien²; Glen Hansen²; ¹Clemson University; ²Sandia National Laboratories

10:50 AM

Microstructure-sensitive Modelling of Void Nucleation in Single-phase Polycrystalline Materials: Evan Lieberman¹; Anthony Rollett¹; Edward Kober²; Ricardo Lebensohn²; ¹Carnegie Mellon University; ²Los Alamos National Laboratory

11:10 AM

Frictional Effects of Granular Material under Shock Loading: Efrén Vitali¹; Eric Herbold¹; ¹LLNL

11:30 AM

Topological Characterization of 3D Microstructures with Diffuse Interfaces: Trevor Keller¹; Daniel Lewis¹; ¹Rensselaer Polytechnic Institute

Alloys and Compounds for Thermoelectric and Solar Cell Applications II — Alloys and Compounds for Thermoelectric and Solar Cell Applications: Thermoelectric

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Yoshisato Kimura, Tokyo Institute of Technology; Chih-Huang Lai, National Tsing Hua University; Ce-Wen Nan, Tsinghua University; G. Jeffrey Snyder, California Institute of Technology; Hubert Scherrer, Ecole des Mines; Hsin-jay Wu, National Tsing Hua University

Wednesday AM Room: Cardiff
February 19, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Takao Mori, National Institute for Materials Science (NIMS); G. Snyder, California Institute of Technology

8:30 AM Invited

Functional Metallurgy: A Powerful Approach to Design Thermoelectric Materials: *Stephane Gorsse*¹; Philippe Bellanger¹; Solange Vivès¹; Yves Bréchet²; ¹ICMCB-CNRS; ²SIMAP

8:55 AM Invited

Development of Novel Refractory Compounds as Thermoelectric Materials: *Takao Mori*¹; ¹National Institute for Materials Science (NIMS)

9:20 AM

Potential of High Thermoelectric Efficiency of Silver Selenide: *Tristan Day*¹; Fivos Drymiotis¹; Tiansong Zhang²; Daniel Rhodes³; Xun Shi²; Lidong Chen²; G. Snyder¹; ¹California Institute of Technology; ²Shanghai Institute of Ceramics; ³Florida State University

9:40 AM

Three-dimensional Nanoscale Characterization of PbTe Based Thermoelectric Materials Using Ultraviolet Laser-assisted Atom-probe Tomography: *Yoon-Jun Kim*¹; David Seidman¹; Shih-Han Lo¹; Changqiang Chen¹; Lidong Zhao¹; Rachel Korkosz¹; Vinayak Dravid¹; Mercouri Kanatzidis¹; ¹Northwestern University

10:00 AM

Evaluation of Shear Strength on Pb-free Solder/Diffusion Barrier/Bi₂Te₃ Thermoelectric System: *Neng-I Lin*¹; Ting-Chung Chen¹; Chien-Hsuan Yeh²; Albert T. Wu¹; ¹National Central University; ²Green Energy and Environment Research Laboratories, Industrial Technology Research Institute

10:20 AM Break

10:30 AM Invited

Enhanced Thermoelectric Properties by Nanominiaturization and Elemental Doping: Gang Li¹; Hongliang Liu¹; Feipeng Zhang¹; Ran Zhao¹; Yanqin Liu¹; Qingmei Lu¹; Xin Zhang¹; Jiuxing Zhang¹; Yutian Shu¹; *Fu Guo*¹; ¹Beijing University of Technology

10:55 AM Invited

Chalcogenides as Thermoelectric: New Materials and New Processes: *Franck Gascoin*¹; ¹CRISMAT Laboratory

11:20 AM

Effect of Non-stoichiometry on the Microstructures, Phases and Thermoelectric Properties of Pseudo-binary AgSbSe₂-AgSbTe₂ System: *Hsin-Jay Wu*¹; Sinn-wen Chen¹; ¹National Tsing Hua University

11:40 AM

Interfacial Evolution between Pure Ni Foil Diffusion Barrier and PbTe Based Thermoelectric Materials for Thermoelectric Module Applications: *Haiyang Xia*¹; Fivos Drymiotis²; G Jeffrey Snyder²; Cheng-Lung Chen³; Aiping Wu¹; ¹Tsinghua University; ²California Institute of Technology; ³Academia Sinica

Alumina and Bauxite — Non-bayer Process

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Ian Duncan, Hatch Ltd

Wednesday AM Room: 15B
February 19, 2014 Location: San Diego Convention Center

Session Chair: Hugues Tremblay, Hatch

8:30 AM Introductory Comments

8:35 AM

Tests on Comprehensive Recovery of Iron Minerals and Bauxite from High Iron Diasporic Bauxite by Medium Temperature Metal-based Roasting: *Sichun Hu*¹; Henqing Zhao¹; Min Guo¹; ¹Zhengzhou Institute of Multipurpose Utilization of Mineral Resources, Chinese Academy of Geological Sciences

8:55 AM

The Influence of Mineral Composition of Low-grade Aluminum Ores on Alumina Extraction by Acid Leaching: *Andrey Panov*¹; Alexander Suss¹; Alexander Damaskin¹; Alexander Senyuta¹; ¹RUSAL Engineering & Technology Centre

9:20 AM

Dry Sintering of Nepheline - A New More Energy Efficient Technology: *Sine Bøgh Skaarup*¹; Victor M. Sizyakov²; Victor V. Volkov³; Yuriy A. Gordeyev³; ¹FLSmidth; ²St. Petersburg National Mineral Resources University; ³Closed Corporation "Pikalevo Soda"

9:45 AM

A Study on Sintering Process Optimization of Alumina Attraction from Fly Ash: Yongfeng Xiao¹; *Qi Sun*¹; Baodong Wang¹; Xiaoting Liu¹; Xiaohuan Wang¹; Lijun Zhao¹; Gengzhi Yu¹; ¹National Institute of Clean-and-Low-Carbon Energy (NICE)

10:10 AM Break

10:25 AM Introductory Comments

10:30 AM

Effect of Pressure on Alumina Extraction from Low-grade Bauxite by Acid-leaching Method: *Yusheng Wu*¹; laishi li²; ¹Shenyang University of Technology; ²Shenyang Alumina and Magnesium Engineering and Research Institute

10:55 AM

Extraction of Alumina from Coal-derived Pyrite Flotation Tailing by Pre-desilication-bayer Process: Jun Luo¹; Mingjun Rao¹; Mingxia Liu¹; *Guanghui Li*¹; Tao Jiang¹; ¹School of Minerals Processing and Bioengineering, Central South University

11:20 AM

Extracting Alumina from Low Grade Bauxite with Ammonium Bisulfate Leaching: *Laishi Li*¹; Yusheng Wu²; Yingying Liu¹; ¹Shenyang Aluminum & Magnesium Engineering & Research Institute Co., Ltd.; ²Shenyang University of Technology

11:45 AM

Hydrochemical Method of Low-quality Raw Materials Processing to Alumina: Vladimir Kazakov¹; *Vadim Lipin*²; ¹St. Petersburg State Technologic University of Plant Polymers; ²Saint Petersburg State Polytechnical University



Aluminum Alloys: Development, Characterization and Applications — Corrosion and Fatigue

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
 Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Xiyu Wen, University of Kentucky

Wednesday AM Room: 12
 February 19, 2014 Location: San Diego Convention Center

Session Chair: Tongguang Zhai, University of Kentucky

8:30 AM

A New Approach for Evaluation of Fatigue Life of Al Wire Bonds in Power Electronics: *Golta Khatibi*¹; Martin Lederer¹; Bernhard Czerny¹; Agnieszka Betzwar Kotas¹; Brigitte Weiss¹; ¹University of Vienna

8:50 AM

Aluminum Sensitization and the Navy: *William Golumbfskie*¹; ¹Naval Surface Warfare Center, Carderock Division

9:10 AM

Microstructural and Stress influence on Sensitization of 5xxx Alloys: *William Golumbfskie*¹; Jennifer Gaies¹; Nicholas Jones¹; Mitra Taheri²; ¹Naval Surface Warfare Center, Carderock Division; ²Drexel University

9:30 AM

Long and Small Fatigue Crack Growth in Aluminum Alloys: *Anthony Spangenberg*¹; Anastasios Gavras¹; Diana Lados¹; ¹Worcester Polytechnic Institute, Integrative Materials Design Center

9:50 AM

Welded Aluminum 6061: The Effect of Corrosion on Yield Strength: *Holly Martin*¹; Chris Horstemeyer²; Weiwei Song²; Wilburn Whittington²; Scott Turnage²; Radu Florea²; Jenna Grantham²; Ayesha Hicks²; Hongjoo Rhee²; Roger King²; ¹Chemical Engineering, Youngstown State University; ²Center for Advanced Vehicular Systems, Mississippi State University

10:10 AM Break

10:25 AM

Alumina Silica Brick Corrosion by Different Aluminium Alloys: *Guillermo Monsberger*¹; Christian Majcenovic¹; Gerald Praseta¹; ¹RHI-AG

10:45 AM

Effect of Salt Solution Corrosion on Tensile Properties of Vacuum High Pressure Die Cast A₃₅₆ Alloys Subjected to Heat Treatment: *Yanda Zou*¹; Henry Hu¹; Xuezhi Zhang¹; ¹University of Windsor

11:05 AM

High Cycle Fatigue and Fatigue Crack Propagation Behavior of Modified A7075-T73 Alloy: *Kee-Ahn Lee*¹; Gwan-Yeoung Kim¹; Kyu-Sik Kim¹; Joong-Cheol Park²; Shae-Kwang Kim³; Young-Ok Yoon³; ¹Andong National University; ²Research Institute of Industrial Science & Technology; ³Korea Institute of Industrial Technology

11:25 AM

Effect of the Thermo-mechanical Treatment on IGC Susceptibility of AA 5083 Alloy: *Tamara Radetic*¹; Akram Halap¹; Miljana Popovic¹; Endre Romhanji¹; ¹University of Belgrade

11:45 AM

Characterization of Corrosion Scales on Aluminum Alloy AlFeNi Used for Fuel Cladding in Nuclear Research Reactors: *Diana Nabhan*¹; Bénédicte Kapusta¹; Lionel Séjourné¹; Kimberly Colas¹; Sophie Bosonnet¹; Françoise Barcelo¹; Sandrine Miro¹; Michel Tabarant¹; Didier Hamon¹; Nicolas Dacheux¹; ¹CEA

Aluminum Reduction Technology — Environment II

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
 Program Organizer: Margaret Hyland, University of Auckland

Wednesday AM Room: 13
 February 19, 2014 Location: San Diego Convention Center

Session Chair: David Wong, Light Metals Research Centre

8:30 AM Introductory Comments

8:35 AM

Abart CDS - A New Compact Multi-pollutant Pot Gas and Alumina Handling System: Anders Sorhuus¹; Sivert Ose¹; Geir Wedde²; ¹Alstom; ²Consult

9:00 AM

Development on Electrolytic Cell Gas Cooling: *Antoine de Gromard*¹; Chin Lim¹; El Hani Bouhabila¹; Bernard Cloutier²; Mathieu Frainais²; ¹Solios Environnement; ²Solios Environnement Inc.

9:25 AM

15 Years of GTC Operations at Aldel: Long-Term Assessment of GTC Performance: Anita Folkers¹; Jan de Weerd²; *Peter Klut*²; Edo Engel²; Erik Dupon²; ¹Aluminium Delfzijl; ²Danieli Corus

9:50 AM

Pot Gas Cooling Technologies: Travis Turco¹; *Peter Verbraak*¹; Peter Klut¹; Erik Dupon¹; Edo Engel¹; ¹Danieli Corus

10:15 AM Break

10:30 AM

Modelling HF Generation: The Role of Ambient Humidity: *Youjian Yang*¹; Margaret Hyland²; Chris Seal²; Zhaowen Wang¹; ¹Northeastern University; ²University of Auckland

10:55 AM

Online Monitoring of Aluminium Primary Production Gas Composition by Use of Fourier-transform Infrared Spectrometry: *Thor Anders Aarhaug*¹; Alain Ferber¹; Heiko Gaertner²; Ole Kjos¹; ¹SINTER; ²NTNU

11:20 AM Introductory Comments

11:25 AM

Reducing Greenhouse Gas Emissions during Aluminium Smelting through Development and Implementation of Improved Control Strategies and Operational Practices: *Abdalla Zarouni*¹; ¹DUBAL

Aluminum Reduction Technology — Fundamentals - Modelling

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
 Program Organizer: Margaret Hyland, University of Auckland

Wednesday AM Room: 14A
 February 19, 2014 Location: San Diego Convention Center

Session Chair: Martin Desilets, Sherbrooke University

8:30 AM Introductory Comments

8:35 AM

On the Prediction of the Crust Evolution inside Aluminum Electrolysis Cells: *Marc LeBreux*¹; Martin Désilets¹; Alexandre Blais²; Marcel Lacroix¹; ¹Université de Sherbrooke; ²CRDA Électrolyse, RioTinto Alcan

9:00 AM

An Improved Finite Element Model for Thermal Balance Analysis of Aluminum Electrolysis Cells: Cui Xifeng¹; Zhou Yiwen¹; *Yang Jianhong*¹; ¹Zhengzhou Research Institute of CHALCO

9:25 AM

A Modelling of Heat Losses in Aluminium Reduction Cell with Slotted Anodes: Shuai Yang¹; Jie Li¹; Hongliang Zhang¹; Yujie Xu¹; Xiaojun Lv¹;

Ming Jia¹; ¹Central South University

9:50 AM

AP60 Cell Start-up: Thermal Electrical Mechanical Quarter Cell Model: *Lyès Hacini¹; Jean-François Bilodeau¹; Yves Caratini²; ¹ARDC/Rio Tinto Alcan; ²LRF/Rio Tinto Alcan*

10:15 AM Break

10:30 AM

A Numerical Approach for the Design of Anode Beam Mechanical Systems: *Andre Felipe Schneider¹; Olivier Charette¹; Daniel Richard¹; ¹HATCH Ltd.*

10:55 AM

MHD Stability for Irregular and Disturbed Aluminium Reduction Cells: *Valdis Bojarevics¹; ¹University of Greenwich*

11:20 AM

Revised Benchmark Problem for Modeling of Metal Flow and Metal Heaving in Reduction Cells: *Jinsong Hua¹; Christian Droste²; Kristian Einarsrud; Magne Rudshaug¹; Robert Jorgensen²; Nils-Haavard Giskeodegard²; ¹Institute for Energy Technology; ²Hydro Aluminium*

11:45 AM

Dynamic Simulation of Cell Voltage Resonance Effect in Aluminum Electrolysis Cell: *Yongliang Wang¹; Jun Tie²; Ganfeng Tu¹; Shuchen Sun¹; Rentao Zhao²; Zhifang Zhang²; ¹Northeastern University; ²North China University of Technology*

12:10 PM

Analysis of the MHD Instabilities in Reduction Cells with Lyapunov Method: *Yang Yi¹; Yao Shihuan¹; Yi Xiaobing¹; ¹CHALIECO*

Biological Materials Science Symposium — Biomimetic and Bio-inspired Materials Synthesis

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Po-Yu Chen, National Tsing Hua University; Rajendra Kasinath, Johnson and Johnson Company; Dwayne Arola, University of Washington; Kalpana Katti, North Dakota State University

Wednesday AM

Room: 33A

February 19, 2014

Location: San Diego Convention Center

Session Chairs: Rajendra Kasinath, Johnson and Johnson Company; Ekaterina Novitskaya, University of California, San Diego

8:30 AM

Natural Fiber Biocomposites: Biodegradability and Mechanical Response after Water Immersion: *Nicole-Lee Robertson¹; John Nychka¹; John Wolodko²; ¹University of Alberta; ²Alberta Innovates Technology Futures*

8:50 AM Invited

Using a Polymer-induced Liquid-precursor (PILP) Process to Make Hard Tissues: *Laurie Gower¹; ¹University of Florida*

9:20 AM

Bio-inspired Mechanical Strengthening of Single Crystals of Calcite: *Joseph Carloni¹; Miki Kunitake¹; Lara Estroff¹; Shefford Baker¹; ¹Cornell University*

9:40 AM

Synthesis of Bio-inspired Scaffolds by Freeze Casting and Vapor Deposition: *Pei Chun Chou¹; Pang-Hsuan Li¹; Ying-Tsun Su²; Po-Yu Chen¹; ¹National Tsing Hua University; ²Industrial Technology Research Institute of Taiwan*

10:00 AM Break

10:10 AM Keynote

Biomimetic Micropatterned Surfaces with Switchable Functionality: *Eduard Arz¹; ¹Saarland University*

10:50 AM

Modeling, optimization, fabrication and Testing of a Bio-inspired Segmented Armor System: *Ravi Chintapalli¹; Francois Barthelat¹; ¹McGill*

University

11:10 AM

Analysis of the Effect of a Compliant Layer on Indentation of an Elastic Material: *Fuqian Yang¹; ¹University of Kentucky*

11:30 AM Invited

Structural Integration Design For Enhanced Photoluminescence in Butterfly Wing: *Tongxiang Fan¹; ¹Shanghai Jiaotong University*

Bulk Metallic Glasses XI — Alloy Development and Applications II

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

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Wednesday AM

Room: 2

February 19, 2014

Location: San Diego Convention Center

Session Chairs: Matthew Kramer, Iowa State University; Norbert Mattern, IFW Dresden

8:30 AM Invited

Effect of Thermal History and Plastic Deformation on Diffusion in a Cu-Zr Metallic Glass: Experiments and Simulations: *M. Kramer¹; R. Ott¹; M. Mendeleev¹; ¹Iowa State University*

8:50 AM

Property Evaluation of Rare Earth Element Based Bulk Metallic Glass with High Configurational Entropy: *Jinyeon Kim¹; Hyunseok Oh¹; Hye Jung Chang²; Eunsoo Park¹; ¹Research Institute of Advanced Materials, Department of Materials Science and Engineering, Seoul National University; ²Advanced Analysis Center, Korea Institute of Science and Technology*

9:00 AM Invited

Ti₂₀Zr₂₀Cu₂₀Ni₂₀Be₂₀ and Ti₂₀Hf₂₀Cu₂₀Ni₂₀Be₂₀ High-entropy Bulk Metallic Glasses: *Ke-Fu Yao¹; Hong-Yu Ding¹; ¹Tsinghua University*

9:20 AM

Toward RE-free Aluminium Bulk Metallic Glasses: *Yi Cao¹; Kevin Laws¹; Michael Ferry¹; ¹University of New South Wales*

9:30 AM Invited

Metallic Glass: A New Approach of Printed Silver Electrodes: *Lee Eun Sung¹; Jee Sang-Soo¹; Kim Suk-Jun¹; KIM Se-yun¹; KIM Do-hyang²; KIM Won-Tae³; ¹Samsung Advanced Institute of Technology; ²Yonsei University; ³Cheongju University*

9:50 AM

The Research of a Novel Corneal Suturing Device Based on Bulk Metallic Glass: *Min Zhang¹; Shujie Pang¹; Tao Zhang¹; ¹Beihang University*

10:00 AM Break

10:20 AM Invited

Phase Separation in Liquid and Glassy Gd-based Metallic Alloys: *Norbert Mattern¹; Jun Hee Han¹; Do Hyang Kim²; Juergen Eckert¹; ¹IFW Dresden; ²Yonsei University Seoul*

10:40 AM

Synthesis and Mechanical Properties of Fe-Nb-B Metallic Glasses: Bulk Form and Thin Film: *Jiahao Yao¹; ¹Institute of Metal Research, Chinese Academy of Sciences*

10:50 AM Invited

Mg-Zn-Ca Bulk Metallic Glasses with High Glass Forming Ability, Enhanced Compressive Strength and Corrosion Resistance: *Xidong Hui¹; Y. F. Zhao¹; X. H. Chen¹; X. J. Liu¹; ¹University of Science and Technology Beijing*



11:10 AM Invited

Effect of Structural Relaxation on Deformation Characteristics in Rejuvenated Zr-Cu-Al Bulk Metallic Glass: *Koichi Tsuchiya*¹; Fanqiang Meng¹; Seiichiro Ii¹; Yoshihiko Yokoyama²; Osami Haruyama³; ¹NIMS; ²Tohoku University; ³Tokyo University of Science

11:30 AM Invited

Glass Formation and Properties of New Ternary Bulk Metallic Glasses: *Ran Li*¹; Tao Zhang¹; ¹Beihang University

11:50 AM

Joining of Active Bulk Metallic Glasses in Air: *Wen Chen*¹; Ze Liu²; Jan Schroers¹; ¹Department of Mechanical Engineering & Materials Science, Yale University; ²Center for Research on Interface Structures and Phenomena (CRISP), Yale University

12:10 PM

Nanocrystallization Pathways in Amorphous Melt-spun and Sputtered Al₉₀Tb₁₀ Alloys: Can Yildirim¹; Mert Ovun¹; Mustafacan Kutsal¹; Ryan Ott²; Matthew Kramer²; *Eren Kalay*¹; ¹METU; ²Ames Laboratory US DOE

Cast Shop for Aluminum Production — Metal Treatment

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Edward Williams, Alcoa

Wednesday AM Room: 15A
February 19, 2014 Location: San Diego Convention Center

Session Chair: Stephen Instone, Hydro Aluminium Rolled Products GmbH

8:30 AM Introductory Comments**8:35 AM**

20 Years of LiMCA Utilization in the Aluminum Industry: A Review of the Technology Development and Applications: *Thomas Buijs*¹; Daniel Gagnon¹; Claude Dupuis²; ¹ABB; ²Rio Tinto Alcan

9:00 AM

Clean Aluminum Processing: New Avenues for Measurement and Analysis: *Shaymus Hudson*¹; Diran Apelian¹; ¹Worcester Polytechnic Institute

9:25 AM

Metallurgical Performance of Salt and Chlorine Fluxing Technologies in Casting Furnaces: *Mark Badowski*¹; Stephen Instone¹; Markus Hagen¹; ¹Hydro Aluminium Rolled Products GmbH

9:50 AM

Metal Cleanliness Evaluation of Reusable Ceramic Foam Filters: *D. Corleen Chesonis*¹; Edward Williams¹; Louis Gendreau²; Louis-Pierre Clément²; ¹Alcoa Technical Center; ²Aluminerie de Bécancour

10:15 AM Break**10:30 AM**

Parallel Laboratory, and Industrial Scale Aluminium Filtration Tests with Al₂O₃ and SiC Based CFF Filters: *Martin Syvertsen*¹; Anne Kvithyld¹; Sarina Bao¹; Arne Nordmark¹; Anders Johansson²; ¹SINTEF Materials and Chemistry; ²SAPA Heat Transfer AB

10:55 AM

New Developments of the I-60 SIR Melt Refining Unit: Terje Haugen¹; *Arild Hakonsen*¹; John Olav Fagerlie¹; Mats Ole Jönsson¹; ¹Hycast AS

11:20 AM

A New Vacuum Degassing Process for Molten Aluminum: *Jianmin Zeng*¹; ¹Guangxi University

Celebrating the Megascale: An EPD Symposium in Honor of David G.C. Robertson — Process Modeling and Simulation

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, W A School of Mines; Geoffrey Brooks, Swinburne University of Technology

Wednesday AM
February 19, 2014

Room: 16A
Location: San Diego Convention Center

Session Chairs: Geoffrey Brooks, Swinburne University; Mark Kennedy, ProVal Partners SA

8:30 AM Introductory Comments**8:35 AM Invited**

Computational Modelling of Metallurgical Processes: Achievements and Challenges: *Mark Cross*¹; Nick Croft¹; Diane McBride¹; ¹Swansea University

8:55 AM

Metallurgical Plant Optimization through the Use of Flowsheet Simulation Modelling: *Mark Kennedy*¹; ¹Proval Partners SA

9:15 AM

ChemSheet as a Simulation Platform for Pyrometallurgical Processes: Karri Penttilä¹; Nagendra Tripathi²; Justin Salminen¹; *Perti Koukkari*¹; ¹VTT; ²Glencore-Xstrata

9:35 AM

A Computational Fluid Dynamics Model for a Novel Flash Ironmaking Process: *Miguel Olivas-Martinez*¹; Silvia Perez-Fontes¹; Hong Yong Sohn¹; ¹University of Utah

9:55 AM Break**10:15 AM**

Application of the Combined Reactors Method for Analysis of Steelmaking Process: *Simon Lekakh*¹; David Robertson¹; ¹MST

10:35 AM Invited

Modelling of Slag Foaming Coupled with Decarburisation: *Md Sattar*¹; Jamal Naser¹; Geoffrey Brooks¹; ¹Swinburne University of Technology

10:55 AM Invited

A Methodology for Modeling Electromagnetic Confinement Systems: Application to Levitation Melting: *Nagy El-Kaddah*¹; Thinium Natarajan²; ¹University of Alabama; ²United States Steel Corporation

11:15 AM Invited

Electrochemical Characterization and Modeling of a Solid Oxide Membrane-based Electrolyzer for Production of Magnesium and Oxygen: Xiaofei Guan¹; *Uday Pal*¹; Srikanth Gopalan¹; Adam Powell²; ¹Boston University; ²Infinium

11:35 AM Invited

Phenomenological Models and Animations of Welding and their Impact: *Tarasankar DebRoy*¹; ¹Penn State University

Characterization of Minerals, Metals and Materials 2014 — Characterization of Ferrous Metals

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

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Wednesday AM
February 19, 2014

Room: 7A
Location: San Diego Convention Center

Session Chairs: Donato Firrao, Politecnico di Torino; Jim Hwang, Michigan Technological University

8:30 AM

In Situ X-ray Diffraction Study of Recovery and Recrystallisation in ODS Ferritic Steel Powder: *Nicolas Sallez*¹; Xavier Boulnat²; Andras Borbely³; Cristian Mocuta⁴; Louis Hennet⁵; Dominique Thiaudière⁴; Jean-Luc Béchade⁶; Yann de Carlan⁶; Pauline Moeyaert⁶; Patricia Donnadieu¹; Damien Fabregue²; Michel Perez²; Yves Bréchet¹; ¹CNRS; ²MATEIS - INSA de Lyon; ³Ecole Nationale Supérieure des Mines de Saint-Etienne; ⁴SOLEIL; ⁵CEMHTI; ⁶CEA

8:50 AM

Influence of Grain Boundary Engineering on the 2D and 3D Grain Boundary Network Connectivity in Austenitic Stainless Steel: *Amanda Levinson*¹; David Rowenhorst²; Alexis Lewis²; ¹National Research Council Fellow, Naval Research Laboratory; ²Naval Research Laboratory

9:10 AM

Fatigue Characterization of New Automotive High-strength Steels after Prestraining and Welding: Paolo Matteis¹; Giorgio Scavino¹; Raffaella Sesana¹; Fabio D' Aiuto¹; *Donato Firrao*¹; ¹Politecnico di Torino

9:30 AM

Experimental Investigation of Austenitic Stainless Steel on the Mechanical Properties and Oxidation Resistance: *LI Jie*¹; Shen Peng²; Yan Mi¹; ¹Department of Materials Science and Engineering, Zhejiang University; ²Zhenshi Group Eastern Special Steel Co., Ltd

9:50 AM

Effects of Heat Treatment on Transverse and Longitudinal Mechanical Properties of Engineering Machinery Steel WQ960: *sufen Tao*¹; *Fuming WANG*¹; ¹University of Science and Technology Beijing

10:10 AM Break

10:20 AM

Size and Orientation Dependent Deformation Behavior of a Dual Phase Steel: *Moritz Wenk*¹; Reiner Mönig¹; Oliver Kraft¹; ¹Karlsruhe Institute of Technology

10:40 AM

In-Situ EBSD Investigation of Carbides during Annealing of AISI M42 Steel: *Matjaz Godec*¹; Barbara Šetina Batic¹; Tatjana Vecko Pirtovšek²; ¹Institute of Metals and Technology; ²Metal Ravne d.o.o.

11:00 AM

Investigation on Corrosion Behavior, Micro-structure Evolution, and Chemical Compositions of the Product Layers of API X65 Steel in Corrosive Environment: *Yakun Zhu*¹; Michael Free¹; ¹University of Utah

11:20 AM

Ultrasonic Non-destructive Characterization of Power Plant Steel: *Magdy El Rayes*¹; Ehab El-Danaf¹; Abdulhakim Almajid¹; ¹King Saud University

11:40 AM

Study on Modification of Anti-Oxidation Coating for Steel Billet: *Chen Sheng*¹; ¹Wuhan Iron and Steel Co.

Computational Thermodynamics and Kinetics — Phase-field Simulations

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

Wednesday AM
February 19, 2014

Room: 30D
Location: San Diego Convention Center

Session Chairs: Long-Qing Chen, The Pennsylvania State University; Yunzhi Wang, Ohio State University

8:30 AM Invited

Phase-field Simulation at the Mesoscopic Scale and Its Applications Using Open Phase: *Ingo Steinbach*¹; Oleg Scchyglo¹; ¹Ruhr-University

8:55 AM Invited

Unique Properties of Nano Domains of Martensite: Dong Wang¹; Liangxiang Zhang¹; Xiaobing Ren²; *Yunzhi Wang*³; ¹'Xi'an Jiaotong University; ²National Institute for Materials Science; ³Ohio State University

9:20 AM Invited

Linking Atomistic and Phase-field Simulations using Numerically Coarse-grained Free Energy Functionals: *Jeffrey Rickman*¹; ¹Lehigh University

9:45 AM

Phase-field Modeling of Continuously Cooling in Ti-6Al-4V Alloy: *Yanzhou Ji*¹; Tae Wook Heo¹; Patrick Hricko¹; Todd Palmer¹; Long-Qing Chen¹; ¹The Pennsylvania State University, University Park

10:05 AM Break

10:20 AM Invited

Phase Field Crystal Modeling of Microstructure in Multi-component Alloys: *Nikolas Provatas*¹; Nana Ofori-Opoku¹; Bernadine Jugdutt¹; Matthew Seymour¹; Harith Humadi²; Wahid Fallah³; Jeffrey Hoyt²; ¹McGill University; ²McMaster University; ³Waterloo University

10:45 AM

Coupling Phase-field Model and Dislocation Density Based Crystal Plasticity Model: *Pierre-Louis Valdenaire*¹; Alphonse Finel¹; Yann Le Bouar¹; Benoît Appolaire¹; ¹Onera-CNRS, Laboratoire d'Etude des Microstructures

11:05 AM

Adaptive Phase-field Modeling of Grain Growth in Sintered Uranium Dioxide under High Temperature Gradients: *Benjamin Winchester*¹; Veena Tikare¹; ¹Sandia National Laboratories

11:25 AM

Phase Field Modeling and Simulation of Particulate Magnetolectric Composites: *Fengde Ma*¹; Yongmei Jin¹; Yu Wang¹; Stephen Kampe¹; ¹Michigan Technological University

11:45 AM

Phase Field Simulation of the Stabilization of Nanocrystalline Alloys via Solute Segregation: *Philip Goins*¹; Elizabeth Holm¹; ¹Carnegie Mellon University



Deformation, Damage, and Fracture of Light Metals and Alloys III — Modelings

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

Program Organizers: Ke An, Oak Ridge National Laboratory; Qizhen Li, University of Nevada, Reno

Wednesday AM Room: 19
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Yanfei Gao, University of Tennessee, Knoxville; Sooyeol Lee, Chungnam National University

8:30 AM Invited

Physics and Modeling of Strengthening of Metals by Parallel Stacking Faults: Weiwei Jian¹; Guangming Cheng¹; Carl Koch¹; Qudong Wang²; Yuntian Zhu¹; Suveen Mathaudhu³; ¹North Carolina State University; ²Shanghai Jiaotong University

9:00 AM

Combined Effects of Lode Angle and Sign of Pressure on Yielding and Void Evolution: Oana Cazacu¹; Benoit Revil-Baudard¹; Ricardo Lebensohn²; ¹University of Florida; ²Los Alamos National Laboratory

9:20 AM

Effects of Twinning on Damage Evolution in Porous Materials: Benoit Revil-Baudard¹; Oana Cazacu¹; ¹University of Florida

9:40 AM

An Atomistically-informed Energy Based Theory of Environmentally Assisted Failure: Sriram Ganesan¹; Veera Sundararaghavan¹; ¹Department of Aerospace Engineering, University of Michigan-Ann Arbor

10:00 AM Break

10:15 AM

Role of the Plastic Flow of the Matrix on Yielding and Void Evolution of Porous Solids: Oana Cazacu¹; Benoit Revil-Baudard¹; Nitin Chandola¹; ¹University of Florida

10:35 AM

Banding and Texture Formation in f.c.c. Polycrystals during Rolling Deformation: M. Arul Kumar¹; Sivasambu Mahesh²; ¹Los Alamos National Lab; ²Indian Institute of Technology Kanpur

10:55 AM

Molecular Statics and Molecular Dynamics Simulations of the Critical Stress for Motion of a/3<11-20> Screw Dislocations in a-Ti at Low Temperatures Using a Modified Embedded Atom Method Potential: Satish Rao¹; A. Venkateswaran²; M.D. Letherwood³; ¹UES Inc.; ²Wilberforce University; ³TARDEC

Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — Shock-Induced Deformation and Failure

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

Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Wednesday AM Room: 3
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Vitali Nesterenko, University of California at San Diego; Jerry La Salvia, U.S. Army Research Laboratory

8:30 AM Keynote

Deformation and Failure of Metals Subjected to Laser Shock Loading: Marc Meyers¹; Chia-Hui Lu¹; Bruce Remington²; Eduardo Bringa³; H.-S. Park²; Tane Remington¹; Brian Maddox²; Carlos Ruestes¹; ¹UCSD; ²LLNL; ³Conicet/U. Nacional de Cuyo

9:00 AM Invited

Texture Dependence and Conversion of Plastic Work to Heat in Magnesium Alloys during High Strain Rate Deformation: Dipankar Ghosh¹; Guruswami Ravichandran²; ¹California Institute of Technology; ²California Institute of Technology

9:20 AM Invited

Effect of Pre-strain on the Dynamic Behavior in Tantalum: Jeffrey Florando¹; Nathan Barton¹; Baseem El-Dasher¹; Damian Swift¹; Mukul Kumar¹; Changqiang Chen²; Kalias Ramesh³; Kevin Hemker³; ¹Lawrence Livermore National Laboratory; ²Northwestern University; ³Johns Hopkins University

9:40 AM

High Strain-rate Tensile Response of a Tungsten Heavy Alloy: Juan P. Escobedo¹; Eric Brown¹; Carl Trujillo¹; Ellen Cerreta¹; George Gray III¹; ¹Los Alamos National Laboratory

10:00 AM Introductory Comments A Tribute to Paul DeCarli

10:10 AM Break

10:30 AM Invited

Martensitic Transformations Induced by Impact-generated Tensile Stress Waves: Naresh Thadhani¹; Marc Meyers²; ¹Georgia Institute of Technology; ²University of California at San Diego

10:50 AM

Age Hardening and Its Effects on the Shock Response of Materials: Jeremy Miller¹; ¹AWE

11:10 AM

Capturing Microstructural Features Related to Dynamic Damage Nucleation: Veronica Livescu¹; John Bingert¹; Curt Bronkhorst¹; ¹Los Alamos National Laboratory

11:30 AM

Microstructural Modeling of Dynamic Intergranular and Transgranular Fracture Modes in Crystalline Alloys: S. Ziaei¹; Mohammed Zikry¹; ¹North Carolina State University

11:50 AM

Deformation and Failure of Shocked Bulk Cu-Nb Nanolaminates: Weizhong Han¹; Ellen Cerreta¹; Nathan Mara¹; Amit Misra¹; Irene Beyerlein¹; John Carpenter¹; Shijian Zheng¹; Carl Trujillo¹; Patricia Dickerson¹; ¹Los Alamos National Lab

Electrode Technology for Aluminium Production — Anode Quality and Performance

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Andre Proulx, Rio Tinto Alcan

Wednesday AM Room: 14B
February 19, 2014 Location: San Diego Convention Center

Session Chair: Marc Gagnon, Aluminerie Alouette Inc

8:30 AM Introductory Comments

8:35 AM

An Approach to Help Control Air Permeability of Pre-baked Anodes: Shoujun Zhang¹; Wenxiang Li¹; Euel Cutshall¹; Jinlong Jiang¹; Joe Woo¹; ¹Sunstone Development Co., Ltd

9:00 AM

Optimizing Anode Performance in DUBAL Reduction Cells: Edouard Mofor¹; Sergey Akhmetov¹; T.K. Sahu¹; Jose Blasques¹; Daniel Whitfield¹; Rajwinder Kaur¹; Gregory Meintjes¹; Ali Jassim¹; Saleh Rabba¹; H.R. Devadiga¹; Kamel Alaswad¹; ¹Dubai Aluminium

9:25 AM

Paste Production and Its Performance in Soederberg Smelters: Markus Meier¹; Raymond Perruchoud¹; ¹R&D Carbon Ltd.

9:50 AM Break

10:00 AM

Study of Manufacturing Technology for High Quality Anodes: *Qingcai Zhao*¹; Jingli Zhao¹; Qingbo Zhao¹; ¹Jinan Aohai Carbon Products Corporation Ltd.

10:25 AM

Understanding Anode Overpotential: *Rebecca Thorne*¹; Camilla Sommerseth¹; Ann Mari Svensson¹; Espen Sandnes²; Lorentz Petter Lossius²; Hogne Linga²; Arne Petter Ratvik¹; ¹Norwegian University of Science and Technology (NTNU); ²Hydro Aluminium a.s. Årdal

Energy Technologies and Carbon Dioxide Management — Energy Efficiency and Furnace Technologies

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Education Committee, TMS: Energy Committee

Program Organizers: Cong Wang, Northwestern University; Jan de Bakker, BBA, Inc; Cynthia Belt, Consultant; Animesh Jha, University of Leeds; Neale Neelameggham, Ind LLC; Soobhankar Pati, MOxST Inc.; Leon Prentice, CSIRO

Wednesday AM
February 19, 2014

Room: Balboa
Location: San Diego Marriott Marquis & Marina

Session Chairs: Li Li, Cornell University; Tao Wang, University Of Alabama

8:30 AM

An Experimental Investigation of a Flue Gas Recirculation System for Aluminum Melting Furnaces: *James Wiswall*¹; Mark Kruzynski¹; Srinivas Garimella¹; ¹ALCOA

8:55 AM

Research on Common Biomass Pyrolysis Production of Biomass Carbon, Pyrolysis Gas, and Biomass Tar: Li Yang¹; *Yonggang Wei*¹; Hua Wang¹; Jianhang Hu¹; Kongzhai Li¹; ¹Kunming University of Science and Technology

9:15 AM

Optimization the Preparation of Activated Carbon Form Walnut Shell with Microwave Heating Using Response Surface Methodology: Zheng Zhaoqiang¹; *Xia Hongying*¹; Peng Jinhui¹; Zhang Libo¹; ¹Kunming University of Science and Technology

9:35 AM

Research on Using Carbide Slag to Mineralize the Carbon Dioxide in Electrolytic Aluminum Waste Gas: Liu Yan¹; Fang Yu¹; Liu Guanting¹; Dou Zhihe¹; *Zhang Ting'an*¹; Jiang Xiaoli¹; ¹Northeastern University

10:00 AM Break

10:20 AM

Study on the Combustion Characteristics and Kinetics of Blending Coal: *Xing Xiangdong*¹; Jianliang ZHANG¹; Shan Ren¹; Xingle Liu¹; Zhenyang Wang¹; Hongen Xie¹; ¹University of Science and Technology of Beijing

10:40 AM

Effect of Batch Initial Velocity on the Glass Furnace Efficiency: Nasim Soleimani¹; *Mark Jolly*²; Karl Dearn³; Oliver Brinkman⁴; William Brinkman⁴; ¹Cranfield University ; ²Cranfield University; ³University of Birmingham; ⁴Glassworks Hounsell Ltd

11:05 AM

Kinetic Modeling Study of Oxy-methane Combustion at Ordinary Pressure: *Xianzhong Hu*¹; Qingbo Yu¹; Qin Qin¹; Nan Sun¹; ¹Northeastern University

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Fatigue Investigations of Novel Materials

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

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

Wednesday AM
February 19, 2014

Room: 7B
Location: San Diego Convention Center

Session Chairs: Olivier Pierron, Georgia Institute of Technology; Antonios Kotsos, Drexel University

8:30 AM Introductory Comments

8:35 AM Keynote

Fatigue of Bulk-metallic Glass: *Robert Ritchie*¹; Bernd Gludovatz²; Marios Demetriou³; William Johnson³; ¹University of California Berkeley; ²Lawrence Berkeley National Laboratory; ³California Institute of Technology

9:15 AM Invited

Fatigue Deformation and Failure of Carbon Nanotube-loaded Polyacrylonitrile Fibers: James Collins¹; Vincent Wu¹; Sarthak Vaish¹; *Christopher Muhlstein*¹; ¹Georgia Institute of Technology

9:35 AM Invited

Fatigue Damage in Carbon Fibre Epoxy Composite Under Variable Loading Conditions: *Alan Plumtree*¹; ¹University of Waterloo

9:55 AM Invited

Fatigue Behavior of Surface Nanocrystallized Zirconium: *Conghui Zhang*¹; Yaomian Wang¹; ¹'Xi'an University of Architecture and Technology

10:15 AM Break

10:35 AM Invited

Processing and Fatigue Crack Growth Behavior of Cold-spray 6061 Aluminum Alloys: *Anastasios Gavras*¹; Diana Lados¹; Victor Champagne²; ¹Worcester Polytechnic Institute; ²US Army Research Labs

10:55 AM

Comparative Investigation of Fatigue-induced Grain Boundary Instability in Nanoscale Metal Films: *Bin Zhang*¹; Tingyu Xiao¹; Xuemei Luo²; Xiaofei Zhu²; Guang-Ping Zhang²; ¹Key Laboratory for Anisotropy and Texture of Materials (Ministry of Education), Northeastern University, China; ²Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences

11:15 AM

Acoustic Emission Monitoring of Fatigue Crack Growth in a NiTi/AA7050 Composite: *William Leser*¹; John Newman¹; Jacob Hochhalter¹; Fred Parker¹; Fuh-Gwo Yuan²; ¹NASA Langley Research Center; ²North Carolina State University

11:35 AM

Role of Intermetallics on Mechanical Properties of Al-Cu Interfaces: *Alice Lassnig*¹; Christopher Torbet²; Golta Khatibi¹; Michael Zehetbauer¹; Tresa Pollock²; ¹University of Vienna; ²UC Santa Barbara

11:55 AM Concluding Comments



Gamma TiAl Alloys 2014 — Session V

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Titanium Committee

Program Organizers: Young-Won Kim, Gamteck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimidik, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

Wednesday AM
February 19, 2014

Room: 6B
Location: San Diego Convention Center

Session Chairs: Christoph Leyens, Fraunhofer IWS; Deliang Zhang, Shanghai Jiao Tong University

8:30 AM Invited

Design of Surface Protection for TiAl Alloys: *Michael Schuetze*¹; ¹DECHEMA-Forschungsinstitut

8:55 AM

Development of New Coatings to Prevent Environmental Embrittlement of Titanium Aluminides: *Patrick Masset*¹; Friedrich Bleicher²; Laurent Bortolotto³; Georg Geiger²; Andreas Kolitsch⁴; Cecile Langlade⁵; Jonathan Paul⁶; Bernadeta Pelic⁴; Florian Pyczak⁶; David Rafaja⁷; Peter Schumacher⁸; Michael Schütze³; Gerhard Wolf¹; Rossen Yankov⁴; ¹Fraunhofer UMSICHT; ²TU Wien; ³Dechema Forschungsinstitut; ⁴HZDR; ⁵UTBM; ⁶HZG; ⁷TU Freiberg; ⁸ÖGI

9:15 AM Invited

Wear Protection for Turbine Blades Made of Titanium Aluminum: *André Werner*¹; ¹MTU Aero Engines AG

9:40 AM Invited

Electron Beam Joining of γ -Titanium Aluminide: Uwe Reissen¹; Simon Olshok¹; *Alexander Backhaus*¹; ¹RWTH Aachen University

10:05 AM Break**10:25 AM**

Influence of the Slag Composition on the Fluorine Absorption in Gamma-TiAl during IESR: *Peter Spiess*¹; Bernd Friedrich¹; ¹RWTH Aachen University

10:45 AM

Microstructure and Mechanical Properties of a Fine Structured Gamma TiAl Alloy Synthesized by a Powder Metallurgy Route: *Deliang Zhang*¹; Xun Yao¹; ¹Shanghai Jiao Tong University

11:05 AM

Formation of a Protective Alumina Scale during Initial Oxidation of F-doped TiAl: *Hans-Eberhard Zschau*¹; Michael Schütze¹; ¹DECHEMA - Forschungsinstitut

11:25 AM

Enhancement of the High Temperature Oxidation Resistance of TiAl-alloys by Fluorine: *Alexander Donchev*¹; Simone Friedle¹; Mathias Galetz¹; Michael Schütze¹; Rossen Yankov²; Andreas Kolitsch²; ¹DFI; ²HZDR

Hume-Rothery Award Symposium: Thermodynamics and Kinetics of Engineering Materials — Materials Systems for Energy

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Hans Juergen Seifert, Karlsruhe Institute of Technology (KIT); Alan Luo, The Ohio State University; Peter Uggowitzer, ETH Zürich; Fan Zhang, CompuTherm, LLC

Wednesday AM
February 19, 2014

Room: 6C
Location: San Diego Convention Center

Session Chairs: Hyuck Lee, Korea Advanced Institute of Science and Technology (KAIST); Jungshen Wang, Ford Motor Company

8:30 AM Invited

Interfacial Reactions of Sn with the n-Type Bi₂(Te,Se)₃ and p-Type (Bi,Sb)₂Te₃ Thermoelectric Materials: *Sinn-wen Chen*¹; Hsin-jay Wu¹; Chih-yu Wu¹; Chun-fei Chang¹; ¹National Tsing Hua University

8:50 AM

Calorimetric Studies of Lithium Ion Cells and Their Constructing Materials: *Hans Juergen Seifert*¹; Carlos Ziebert¹; Elke Schuster¹; ¹Karlsruhe Institute of Technology (KIT)

9:10 AM

Determination of Thermodynamic Properties by Experimental and Computational Methods for New Lithium-ion Batteries: *David Henriques*¹; Marco Prill¹; Siaufung Dang¹; Torsten Markus¹; ¹Forschungszentrum Jülich

9:30 AM Invited

Thermodynamic Assessment of the Sn Based Anode Material Systems for Li-ion Batteries: *Dajian Li*¹; Hans Flandorfer²; Torsten Markus³; Damian Cupid¹; ¹Karlsruhe Institute of Technology; ²University of Vienna; ³Forschungszentrum Jülich GmbH

9:50 AM

Thermodynamic Investigations and Modeling of Copper and Iron Oxides Used as Conversion Electrodes in Lithium Ion Batteries: *Maren Lepple*¹; Peter Franke¹; Damian Cupid¹; Hans Seifert¹; ¹Karlsruhe Institute of Technology

10:10 AM Break**10:30 AM**

The Cadmium – praseodymium System: Phase Equilibria, Thermodynamic Investigations and CALPHAD Optimization: *Thomas Reichmann*¹; Klaus Richter¹; Herbert Ipser¹; ¹University of Vienna

10:50 AM

Thermodynamic Assessment of Pu-based Alloys: *Aurelien Perron*¹; Patrice Turchi²; Alexander Landa²; P. Söderling²; Brice Ravat³; Benoit Oudot³; Francois Delaunay³; ¹LLNL/CEA; ²LLNL; ³CEA

11:10 AM

Thermodynamic Investigations in the Ternary Al-Ti-Cr System: *Mario Krieger*¹; Olga Fabrichnaya¹; Dmytro Pavlyuchkov¹; David Rafaja¹; Hans Seifert²; ¹TU Bergakademie Freiberg; ²Karlsruhe Institute of Technology

11:30 AM

Alloy Compatibility Study for Dual Alloy Disc Development: *Caroline Goddard*¹; Mark Hardy²; Cathie Rae¹; ¹University of Cambridge; ²Rolls-Royce plc.

ICME: Linking Microstructure to Structural Design Requirements — ICME: Linking Microstructure to Structural Design Requirements- V

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS; Integrated Computational Materials Engineering Committee
Program Organizers: Rajiv Mishra, University of North Texas; David Furrer, Pratt & Whitney; Peter Collins, University of North Texas; Charles Ward, Air Force Research Laboratory; Craig McClung, Southwest Research Institute

Wednesday AM Room: 31A
February 19, 2014 Location: San Diego Convention Center

Session Chair: Peter Collins, University of North Texas

8:30 AM Invited

Changing the Paradigm for Engineering Design by Merging High Energy X-ray Data with Materials Modeling: *Jay Schuren*¹; Paul Shade¹; Todd Turner¹; Robert Suter²; Jonathan Lind²; Joel Bernier³; Frankie Li³; Jonathan Almer⁴; Peter Kenesei⁴; Ulrich Lienert⁵; ¹AFRL/RXCM; ²Carnegie Mellon University; ³Lawrence Livermore National Laboratory; ⁴Argonne National Laboratory; ⁵DESY

9:10 AM Invited

Imperfection Modeling to Determine Probabilistic Materials Behavior for Zr Nuclear Fuel Clad Tubes: Curt Lavender¹; Elizabeth Stephens²; *Richard Davies*²; ¹Pacific Northwest National Laboratory; ²PNNL

9:50 AM

Material Interface Effects on the Topology Optimization of Multi-phase Structures Using a Level Set Method: *Natasha Vermaak*¹; Georgios Michailidis²; Guillaume Parry³; Rafael Estevez³; Gregoire Allaire²; Yves Brechet³; ¹Lehigh University; ²Ecole Polytechnique; ³Institut National Polytechnique de Grenoble

10:10 AM Break

10:30 AM

Explicit Incorporation of Cementite in Pearlite Steel Modeling: *Benjamin Anglin*¹; Tomoko Sano¹; Charles Randow¹; Chian-Fong Yen¹; ¹US Army Research Laboratory

10:50 AM

Design of Multifunctional Material Architectures Using Topology Optimization: *James Guest*¹; Seunghyun Ha¹; Johns Hopkins University

Length Scaling of Lamellar and Patterned Microstructures During Solid-Solid Phase Transformations and Solidification — Eutectics

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM; Phase Transformations Committee, TMS; Solidification Committee
Program Organizers: Robert Hackenberg, Los Alamos National Lab; Carlos Capdevila-Montes, CENIM-CSIC; Amy Clarke, Los Alamos National Laboratory; John Perepezko, University of Wisconsin-Madison

Wednesday AM Room: 32A
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Ralph Napolitano, Iowa State University; Amber Genau, University of Alabama at Birmingham

8:30 AM Invited

Template-directed Directionally Solidified Eutectic Metamaterials: *Paul Braun*¹; ¹University of Illinois at Urbana-Champaign

9:00 AM

Versatile Aligned Eutectics: From High Temperature Structural Materials to Functional Nanodevices: *Srdjan Milenkovic*¹; IMDEA Materials Institute

9:25 AM Invited

Multiphase Solidification Structures and Mechanisms in Ternary Alloys: *Ralph Napolitano*¹; Irmak Sargin¹; ¹Iowa State University

9:55 AM Break

10:15 AM Invited

Quantifying Length Scale Evolution in Higher Order Eutectics: *Amber Genau*¹; ¹University of Alabama at Birmingham

10:45 AM

Real-time Study of Dynamical Instabilities of Rodlike Eutectic Solidification Patterns: *Silvere Akamatsu*¹; Mikael Perrut²; Sabine Bottin-Rousseau¹; Gabriel Faivre¹; Mathis Plapp³; ¹CNRS - UPMC; ²ONERA; ³LPMC - Ecole Polytechnique

11:10 AM

Cooperative Growth but Uncooperative Melting?: *Seth Imhoff*¹; Paul Gibbs¹; Martha Katz¹; Jason Cooley¹; Wah-Keat Lee²; Kamel Fezzaa³; Alex Deriy³; Amy Clarke¹; ¹Los Alamos National Laboratory; ²Brookhaven National Laboratory; ³Argonne National Laboratory

Magnesium Technology 2014 — Melting, Modelling, and Solidification

Sponsored by: TMS Light Metals Division, TMS; Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Wednesday AM Room: 17A
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Dallas Trinkle, University of Illinois; James Saal, North Western University

8:30 AM

Finite-element Analysis of Melt Flow in Horizontal Twin-roll Casting of Magnesium Alloy AZ31: *Jong Jin Park*¹; ¹Hongik University

8:50 AM

Nucleation and Growth of Metastable Phases in Mg-Nd, Mg-Gd and Mg-Gd-Nd Based Alloys: Suzan Abd El Majid¹; Galit Atiya¹; Menachem Bamberger¹; *Alexander Katsman*¹; ¹Technion - Israel Institute of Technology

9:10 AM

A Numerical and Experimental Study of Flow Behaviour in High Pressure Die Casting: *Mahdi Saeedipour*¹; Simon Schneiderbauer¹; Stefan Pirker¹; Salar Bozorgi²; ¹Johannes Kepler University; ²LKR Leichtmetallkompetenzzentrum Ranshofen GmbH

9:30 AM

In Situ Synchrotron Radiation Diffraction during Melting and Solidification of Mg-Al Alloys Containing CaO: *Björn Wiese*¹; Chamini Mendis¹; Domonkos Tolnai¹; Gábor Szakács¹; Norbert Hort¹; Karl Kainer¹; Andreas Stark¹; Norbert Schell Norbert Schell¹; Heinz-Peter Reichel²; R Brückner²; ¹Helmholtz-Zentrum Geesthacht; ²LMpv Leichtmetall - Produktion & Verarbeitung GmbH

9:50 AM

Solidification Characteristics of Wrought Magnesium Alloys Containing Rare Earth Metals: *Amjad Javaid*¹; Frank Czerwinski¹; Renata Zavadil¹; Marta Aniolek¹; Amir Hadadzadeh²; ¹CANMET Materials; ²University of Waterloo

10:10 AM Break

10:30 AM

Strengthening Due to the Percolating Eutectic Microstructure in Squeeze Cast MRI230D: *Bao Zhang*¹; Anumalasetty Nagasekhar¹; Carlos Caceres¹; ¹The University of Queensland

10:50 AM

Effect of Al Addition on Microstructure of AZ91D: *Utsavi Joshi*¹; Hari Babu Nadendla¹; ¹Brunel University



11:10 AM

In Situ Synchrotron Radiation Diffraction during Solidification of Mg₄Y and Mg₄YxGd Alloys (x = 1, 4 wt.-%): *Gabor Szakacs*¹; Karl Kainer¹; Norbert Schell¹; Andreas Stark¹; Björn Wiese¹; Chamini Mendis¹; Domonkos Tolnai¹; Norbert Hort¹; ¹Helmholtz-Zentrum Geesthacht

11:30 AM

A New Method for Melting Mg-Li Alloys: *Liu Gong*¹; Jieyu Zhang¹; Tian Yin¹; Jia Wei¹; Guangxin Wu¹; ¹Shanghai University

Magnetic Materials for Energy Applications IV — Magnetocaloric Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Magnetic Materials Committee

Program Organizers: Thomas G. Woodcock, IFW Dresden; Julia Lyubina, Evonik Industries AG; Matthew Willard, Case Western Reserve University

Wednesday AM
February 19, 2014

Room: Ballroom G
Location: San Diego Marriott Marquis & Marina

Session Chairs: Vitalij Pecharsky, Ames Laboratory; Kelly Morrison, Loughborough University

8:30 AM Invited

Fe and Mn Based Materials for Magnetic Refrigeration: *Ekkes Brüück*¹; Francois Guillot¹; ¹Delft University of Technology

9:00 AM

Novel Synthetic Approach to Metal-pnictide/Metalloid Based Magnetocaloric Compounds for Material Exploration and Practical Application: *Soon-Jae Kwon*¹; In-Gyu Kim¹; Seung-Ho Lee¹; Eun-Sung Lee¹; Sang-Mock Lee¹; In-Taek Han¹; ¹Samsung Advanced Institute of Technology

9:20 AM Invited

The Magnetocaloric Effect in Nanostructured Materials: *Victorino Franco*¹; Alejandro Conde¹; ¹Sevilla University

9:50 AM

Affordable High Performance Magnetocaloric Fluids: *Raju Ramanujan*¹; Chen Xi¹; V Chaudhary¹; P Kumar¹; ¹Nanyang Technological University

10:10 AM Break

10:25 AM

The Magnetocaloric Effect in a Composite Based on the Series Er_{1-x}Tb_xAl₂: *Paula Ribeiro*¹; Alexandre Carvalho²; Bruno Alho¹; Eduardo Nóbrega¹; Thiago Alvarenga¹; Airton Caldas¹; Vinícius de Sousa¹; Nilson de Oliveira¹; Pedro von Ranke¹; ¹UERJ; ²Universidade Federal de São Paulo

10:45 AM

Enhanced Magnetocaloric Effect (MCE) in Polycrystalline Ni₂MnGa Alloys through Isobaric Thermal Cycling and Correlation with Texture Changes: *Michael McLeod*¹; Anit Giri²; Le Zhou³; Sven Vogel⁴; Yongho Sohn³; Kyu Cho²; Bhaskar Majumdar¹; ¹New Mexico Tech; ²US Army Research Laboratories; ³University of Central Florida; ⁴Los Alamos National Laboratory

11:05 AM

Martensitic Transformations Study from Composition Gradients Generated by Diffusion Couples for in NiMnGa System: *Le Zhou*¹; Anit Giri²; Kyu Cho²; Yongho Sohn¹; ¹University of Central Florida; ²U.S. Army Research Laboratory

Materials and Fuels for the Current and Advanced Nuclear Reactors III — Structural Materials III

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

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Wednesday AM
February 19, 2014

Room: 33C
Location: San Diego Convention Center

Session Chair: Yong Yang, University of Florida

8:30 AM Invited

High Temperature Fracture Toughness Testing for Advanced Reactor Applications: *Randy Nanstad*¹; Xiang Chen¹; Mikhail Sokolov¹; ¹Oak Ridge National Laboratory

8:55 AM

Material Selection for Accident Tolerant Fuel Cladding: *Bruce Pint*¹; Kurt Terrani¹; Yukinori Yamamoto¹; Lance Snead¹; ¹Oak Ridge National Laboratory

9:10 AM

Grain Boundary Engineering of Alloy 617 through Cold Deformation and Annealing: *Behrang Poorganji*¹; Deepthi Tammana¹; Xingshou Wen¹; Richard Wright²; T-L. Sam Sham³; vijay vasudevan¹; ¹University of Cincinnati; ²Idaho National Lab; ³Oak Ridge National Laboratory

9:25 AM

Effect of Nanocrystalline Grain Size on Mechanical Property Variation during Irradiation of Electrodeposited Nickel Coatings: Satish Gautam¹; Christopher David²; Karthiselva N.S.¹; B.K. Panigrahi²; Nitin Wasekar³; *Srinivasa Bakshi*¹; ¹Indian Institute of Technology Madras; ²Indira Gandhi Centre for Atomic Research; ³ARCI

9:40 AM Break

10:00 AM

Corrosion Behavior of Alumina-forming Austenitic Steels in Supercritical Carbon Dioxide: *Lingfeng He*¹; Paul Roman¹; Bin Leng¹; Kumar Sridharan¹; Mark Anderson¹; Todd Allen¹; ¹University of Wisconsin-Madison

10:15 AM

Thermal Aging Effect on Fracture Toughness of Modified 9Cr-1Mo Steel for Advanced Reactor Applications: *Xiang Chen*¹; *Randy Nanstad*¹; Mikhail Sokolov¹; ¹Oak Ridge National Laboratory

10:30 AM

Impacts of Hydrogen in Unirradiated Zircaloy Nuclear Cladding under Dry Storage Conditions: *Rick Shimskey*¹; ¹Pacific Northwest National Laboratory

10:45 AM

Effect of Ni on Formation of Intermetallic Phases in Highly Irradiated Reactor Pressure Vessel Steels: *Peter Wells*¹; G. Odette¹; Nicholas Cunningham¹; Tim Milot¹; Yuan Wu¹; Takuya Yamamoto¹; Jim Cole²; Brandon Miller²; ¹UC Santa Barbara; ²Idaho National Laboratory

11:00 AM

Effects from Cr Concentration on Stability against Inter-diffusion between Lanthanides and Fe-Cr Alloys: *Wei-Yang Lo*¹; Yuedong Wu¹; Nicolas Silva¹; Yong Yang¹; ¹University of Florida

11:15 AM

Thermal Stability of Ultrafine Grained Austenitic ODS Steel: *Xiaodong Mao*¹; Chang Hee Han¹; Tae Kyu Kim¹; Kyu Hwan Oh²; Jinsung Jang¹; ¹Korea Atomic Energy Research Institute; ²Seoul National University

11:30 AM

Mechanical Properties and Microstructure of Ultrafine-grained Zircaloy-4 processed through Multiaxial Forging: Devasri Fuloria¹; *Jayaganthan R*¹; Dinesh Srivastava¹; Dey G.K¹; Saibaba N¹; ¹IIT Roorkee

Materials Aspects of Corrosion and Fouling in Oil Refining and Exploration — Session I

Sponsored by: TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee
Program Organizer: David Millin, University of Alberta and NINT NRC

Wednesday AM
February 19, 2014
Room: Mission Hills
Location: San Diego Marriott Marquis & Marina

Session Chair: To Be Announced

8:30 AM Invited

Engineering Nanostructured Materials for Extreme Applications: *Troy Topping*¹; Kaka Ma¹; William Golumbfskie²; Julie Schoenung¹; Enrique Lavernia¹; ¹University of California, Davis; ²Naval Surface Warfare Center, Carderock

8:50 AM Invited

Materials Solutions for Fouling Mitigation in Oil and Gas: *Seth Taylor*¹; Les Jackowski¹; ¹Chevron Energy Technology Company

9:10 AM Invited

Mechanism of Corrosion-enhanced Erosion of Steels in Oil and Gas Production: Baotong Luo¹; Dahai Xia²; *Jingli Luo*²; ¹Southwest Research Institute; ²University of Alberta

9:30 AM Invited

Microstructure Engineering of the Heat Affected Zone in Linepipe Steels: *Matthias Militzer*¹; Jennifer Reichert¹; Faysal Eliyan¹; Akram Alfantazi¹; ¹The University of British Columbia

9:50 AM Break

10:00 AM Invited

Microstructure of Low Alloy Steels for Casing Application in Sour Environments: Weishan Huang¹; *Jingli Luo*¹; Barry Wiskel¹; Hani Henein¹; Josiah Jordan¹; ¹University of Alberta

10:20 AM Invited

Advance Alloys for Sour HPHT: Thermo-mechanically Processed Ultra-fine Grain UNS N07718: *Indranil Roy*¹; Manuel Marya¹; Paul Maxwell²; Xinghang Zhang³; ¹Schlumberger; ²Carpenter Technology; ³Texas A&M University

10:40 AM Invited

Comparison of Scales Formed on Laboratory Coupons and Field Components Using X-ray Microdiffraction: Implications for Corrosion Rate Prediction and Reliability: *Monica Barney*¹; Andrew Nissan¹; ¹Chevron Energy Technology Company

11:00 AM Invited

Wear Resistance of the Ti/TiC Coatings Deposited by Means of Supersonic Cold Gas Spray Technique: *Jan Kusinski*¹; Slawomir Kac¹; Sergi Dosta²; Jorge Garcia-Forgas³; ¹University of Mining and Metallurgy; ²Universitat de Barcelona Martí i ; ³ALHENIA AG

Materials for High-temperature Applications: Next Generation Superalloys and Beyond — Mo- and Ni-Based Alloys

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Refractory Metals Committee
Program Organizers: Omer Dogan, DOE National Energy Technology Laboratory; Panos Tsakiroopoulos, University of Sheffield; Xingbo Liu, West Virginia University; Paul Jablonski, DOE National Energy Technology Lab; Junpin Lin, University of Science and Technology Beijing

Wednesday AM
February 19, 2014
Room: 6D
Location: San Diego Convention Center

Session Chairs: Junpin Lin, University Science and Technology Beijing; Todd Leonhardt, Rhenium Alloys, Inc.

8:30 AM Invited

Effect of Ti-macroalloying on Phase Formation and Properties of Mo-borosilicide Alloys: *Martin Heilmaier*¹; Daniel Schliephake¹; Maria Azim²; Bronislava Gorr²; Hans-Jürgen Christ²; ¹Karlsruhe Institute of Technology; ²University of Siegen

9:00 AM Invited

Environmental Resistance of Mo-Si-B Alloys and Coatings: *John Perepezko*¹; Travis Sossaman¹; ¹University of Wisconsin-Madison

9:30 AM

Microstructure and Creep Properties of Mo-Si-B Base Alloys at High Temperatures: *Christian Hochmuth*¹; Daniel Schliephake²; Rainer Völkl¹; Martin Heilmaier²; Uwe Glatzel¹; ¹University Bayreuth; ²Karlsruhe Institute of Technology

9:50 AM

Destablizing Mo3Si Phase in Mo-Si-B Alloys by Tungsten Additions and Its Oxidative Resistance: *Pratik Ray*¹; Matthew Kramer¹; Mufit Akinc²; ¹Ames Laboratory, US-DOE; ²Iowa State University

10:10 AM Break

10:25 AM

Oxidation Performance of Mo-Mo3Si-Mo5SiB2 Alloys and Coated Mo-Si-B Materials: *Manja Krüger*¹; Georg Hasemann¹; Torben Baumann¹; Sebastian Dieck¹; Stefan Rannabauer¹; Michael Scheffler¹; ¹Otto-von-Guericke University Magdeburg

10:45 AM Invited

Welding Behavior of Molybdenum: *Todd Leonhardt*¹; ¹Rhenium Alloys Inc

11:15 AM

Atomistic Modeling of Zr, Si Segregation at Twist and Tilt Grain Boundaries in Molybdenum: *Olena Lenchuk*¹; Karsten Albe¹; ¹TU Darmstadt

11:35 AM

Mechanical Properties and Fracture Behavior of NiAl-V In Situ Composites: *Srdjan Milenkovic*¹; Rubens Caram²; ¹IMDEA Materials Institute; ²State University of Campinas

11:55 AM

Transformation and Deformation Mechanisms in High Temperature Shape Memory Alloys with Nanoprecipitates: Yunzhi Wang¹; Pete Anderson¹; Michael Mills¹; Fan Yang¹; Matthew Bowers¹; *Lee Casalena*¹; Yipeng Gao¹; Xiang Chen¹; ¹The Ohio State University



Mechanical Behavior at the Nanoscale II — Nanostructured Composites and Glasses

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Wednesday AM
 February 19, 2014

Room: 9
 Location: San Diego Convention Center

Session Chairs: Timothy Rupert, University of California, Irvine; Nathan Mara, Los Alamos National Laboratory

8:30 AM Invited

Influence of Biphasic Interfacial Character on the Mechanical Response of Nanolamellar Composites: *Nathan Mara*¹; John Carpenter¹; Thomas Nizolek²; Shijian Zheng¹; Weizhong Han¹; William Mook¹; Tresa Pollock²; Irene Beyerlein¹; ¹Los Alamos National Laboratory; ²University of California, Santa Barbara

9:00 AM Invited

Strengthening Effect of Single-atomic-layer Graphene in Metal-graphene Nanolayered Composites: *Seung Min Han*¹; ¹Korea Advanced Institute of Science and Technology

9:30 AM

Micro-mechanical Characterization of Ultra-high Strength Dendritic Tungsten Thermal Barrier Coatings: *Yaofang Zhang*¹; *Jaafar El-Awady*¹; ¹Johns Hopkins University

9:50 AM

Comparison of Nano-indentation Results Obtained with Berkovich, Cube-corner and Cono-spherical Indenter Tips in Al-Cu Alloys: *Vipul Gupta*¹; Jacob Hochhalter²; Stephen Smith²; ¹National Institute of Aerospace; ²NASA Langley Research Center

10:10 AM Break

10:25 AM

Enhanced Strength and Damage Tolerance in 3D Nano-architected Metamaterials: *Lucas Meza*¹; Dongchan Jang¹; Harold Greer¹; Julia Greer¹; ¹California Institute of Technology

10:45 AM Invited

Simulation of Complex Materials Structures with Charge Optimized Many-body (COMB) Potentials: *Simon Phillpot*¹; Yangzhong Li¹; Mark Noordhoek¹; Tzu-Ray Shan²; Tao Liang¹; Susan Sinnott¹; ¹University of Florida; ²Sandia National Laboratories

11:15 AM

Understanding the Failure of Sodium Borosilicate Glasses: From the Macroscale to the Microscale: *Cindy Rountree*¹; Marina Barlet¹; Jean-Marc Delay¹; Daniel Bonamy¹; ¹CEA

11:35 AM

High Temperature Nanomechanical Testing: Softening and Melting of Soda Lime Glass: *Jeremiah Vieregge*¹; Ude Hangen¹; Katie Fisher¹; ¹Hysitron

11:55 AM

Ultra-low Density Nanotubular Metal Oxides with Super-high Modulus and Strength by Atomic Layer Deposition: *Jianchao Ye*¹; Andreas Baumgaertel¹; Yinmin Wang¹; Juergen Biener¹; Monika Biener¹; ¹Lawrence Livermore National Laboratory

Mechanical Behavior Related to Interface Physics II — Twinning Effects on Mechanical Deformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Nan Li, Los Alamos National Laboratory; Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Tonya Stone, Mississippi State University

Wednesday AM
 February 19, 2014

Room: 11A
 Location: San Diego Convention Center

Session Chairs: Garritt Tucker, Sandia National Laboratories; Giacomo Po, UCLA

8:30 AM Invited

Mechanical behavior of Nanotwinned Metals: *Xinghang Zhang*¹; D. Bufford¹; Y. Liu¹; H. Wang¹; ¹Texas A&M University

9:00 AM

A 2D Dislocations Dynamics Model for Nanotwinned Materials: *Hakan Yavas*¹; Richard LeSar²; ¹The Ames Laboratory; ²Iowa State University

9:20 AM

Angstrom Scaled Twin Boundary Role on Ductile to Brittle Transition in Soft Gold Wires: *Scott Mao*¹; Jiangwei Wang¹; Frederic Sansoz²; Jianyu Huang³; ¹University of Pittsburgh; ²The University of Vermont; ³None

9:40 AM Invited

Mechanisms of Dipolar Loop Formation and Interactions in FCC metals: *Giacomo Po*¹; Tamer Crosby¹; Nasr Ghoniem¹; ¹UCLA

10:10 AM Break

10:30 AM Invited

The Influence of Twin Boundaries on the Stability and Deformation of Nanocrystalline Copper with Atomistic Simulations: *Garritt Tucker*¹; Stephen Foiles²; ¹Drexel University; ²Sandia National Laboratories

11:00 AM

Extraordinary Stability of Nano-twinned Structure and Its Mechanical Behavior in Electrodeposited Co-Ni Alloys: *Xuejun Jin*¹; Jiayao Li¹; Wei Li¹; ¹Shanghai Jiao Tong University

11:20 AM

Twin-twin Interactions in Magnesium Single Crystal: *Qin Yu*¹; Jian Wang²; Yanyao Jiang¹; Rodney McCabe²; Carlos Tomé²; ¹Department of Mechanical Engineering, University of Nevada, Reno; ²Los Alamos National Laboratory

11:40 AM

In Situ and Ex Situ TEM Experiments to Elucidate Defect Interface Interactions in Ag-Cu Composites: *Ben Eftink*¹; Owen Kingstedt¹; John Lambros¹; Nathan Mara²; Ian Robertson¹; ¹University of Illinois; ²Los Alamos National Laboratory

Multiscale Approaches to Hydrogen-assisted Degradation of Metals — Atomistic Modelling of H-microstructure Interactions

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

Program Organizers: Nicholas Winzer, Fraunhofer IWM; Matous Mrovec, Fraunhofer IWM; Brian Somerday, Sandia National Laboratories; Petros Sofronis, University of Illinois; David Bahr, Purdue University; Srinivasan Rajagopalan, ExxonMobil Research and Engineering Company

Wednesday AM
February 19, 2014
Room: 11B
Location: San Diego Convention Center

Session Chairs: Matous Mrovec, Fraunhofer IWM; Tilmann Hickel, Max-Planck-Institut für Eisenforschung

8:30 AM Invited

Ab Initio Based Understanding of the Segregation and Diffusion Mechanisms of Hydrogen in Steels: *Tilmann Hickel*¹; Roman Nazarov¹; Aurab Chakrabarty¹; Poulumi Dey¹; Gerard Leyson¹; Robert Spatschek¹; Blazej Grabowski¹; Jörg Neugebauer¹; ¹Max-Planck-Institut fuer Eisenforschung GmbH

9:10 AM

First-principles Models for Radiation Damage in D-T Fusion Power Plants: *Duc Nguyen-Manh*¹; S.L. Dudarev¹; ¹Culham Centre for Fusion Energy

9:30 AM

Coupled Atomistic-analytical Approach to Study Hydrogen Embrittlement by Nano-hydride Formation: *Blazej Grabowski*¹; Gerard Leyson¹; Jörg Neugebauer¹; ¹Max-Planck-Institut für Eisenforschung

9:50 AM Break

10:10 AM Invited

Magnetic Tight Binding Models for Interstitial Elements and Extended Defects in Iron Phases: *Christian Elsaesser*¹; Matous Mrovec¹; Davide Di Stefano¹; Anthony Paxton²; Bernd Meyer³; ¹Fraunhofer IWM, Freiburg, Germany; ²King's College London, United Kingdom; ³University Erlangen-Nuremberg, Germany

10:50 AM

The Effect of Alloying on the Properties of Metal-Hydrogen Systems: Modeling and Simulation of Diffusion, Dislocation Loops, and Phase Changes.: *Clive Freeman*¹; Mikael Christensen¹; Walter Wolf¹; Paul Saxe¹; Erich Wimmer¹; ¹Materials Design, Inc.

11:10 AM

Effects of Hydrogen Concentration, Dislocation Density and Crystal Size in Deformation of Iron Nano-crystals: A Molecular Dynamics Study: Malik Wagih¹; Yizhe Tang²; Tarek Hatem¹; *Jaafar El-Awady*²; ¹British University in Egypt; ²Johns Hopkins University

11:30 AM

An Atomistic Study of Helium-3 Bubble Growth in Aging Palladium Tritides: *Jonathan Zimmerman*¹; Lucas Hale¹; ¹Sandia National Laboratories

Nanoparticulate Materials: Production, Consolidation and Characterization — Consolidation II: Field Assisted Sintering

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

Program Organizers: Brady Butler, U.S. Army Research Laboratory; Eugene Olevsky, San Diego State University

Wednesday AM
February 19, 2014
Room: Carlsbad
Location: San Diego Marriott Marquis & Marina

Session Chair: Javier Garay, UC Riverside

8:30 AM Invited

The Role of the Pressure Parameter in the Current Activated Pressure Assisted Densification (CAPAD) of Nanocrystalline Materials: A Dupuy¹; Y Kodera¹; *J. Garay*¹; ¹UC Riverside

9:00 AM Invited

Synthesis and Processing of Nanoscale B4C Powders: *K Mills*¹; D Martin¹; R Sadangi¹; D Kapoor¹; ¹US Army ARDEC

9:30 AM

Assessment of Electrical Contact Resistance in Spark-plasma Sintering Graphite Tooling: *Diletta Giuntini*¹; Xialu Wei¹; Eugene Olevsky¹; ¹San Diego State University

9:50 AM

Temperature Uniformization in Spark-plasma Sintering by Novel Tooling Design: *Diletta Giuntini*¹; Jan Raethel²; Mathias Herrmann²; Eugene Olevsky¹; ¹San Diego State University; ²Fraunhofer-Institut für Keramische Technologien und Systeme, IKTS Dresden

10:10 AM Break

10:30 AM

On the Role of Electric Current in Spark Plasma Sintering of Conductive Materials: *Eugene Olevsky*¹; Aleksandra Ilyina²; Elena Aleksandrova²; Maria Yurlova²; Igor Bogachev²; Evgeny Grigoryev²; ¹San Diego State University; ²Moscow Engineering Physics University

10:50 AM

Influence of Processing Parameters on Mechanical Properties of Ferritic ODS: Nerea Garcia-Rodriguez¹; Monica Campos¹; *Jose Torralba*²; ¹Universidad Carlos III Madrid; ²IMDEA Materials Institute

Nanostructured Materials for Rechargeable Batteries and Supercapacitors II — Session V

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: David Mitlin, University of Alberta and NINT NRC; Reza Shahbazian-Yassar, Michigan Technological University; Peter Kalisvaart, University of Alberta and NINT NRC

Wednesday AM
February 19, 2014
Room: Ballroom F
Location: San Diego Marriott Marquis & Marina

Session Chairs: Reza Shahbazian-Yassar, Michigan Technological University; Scott Mao, University of Pittsburgh

8:30 AM Invited

Interfaces in Advanced LI Batteries: *Jun Liu*¹; ¹Pacific Northwest National Laboratory

8:45 AM Invited

A Systematic Approach to Extend the Cycle Life of Li/S Cells: *Yuegang Zhang*¹; ¹Lawrence Berkeley National Laboratory

9:00 AM

Facile Synthesis of α -Fe₂O₃ Nanorods Derived from α -FeOOH Nanorods and Its Application as Anode Materials for Rechargeable Sodium-ion Batteries: Shubo Wang¹; *Wei Wang*¹; Liwen Hu¹; Zongqian Hu²; Shuqiang Jiao¹; Hongmin Zhu¹; ¹University of Science & Technology Beijing; ²Beijing Institute of Radiation Medicine



9:15 AM Invited

Graphene Hybridized with Transition Metal Oxides for High-performance Supercapacitors: *Jun Jiao*¹; Wen Qian¹; ¹Portland State University

9:30 AM Invited

Microwave Assisted Sulfur Infusion Technique and the Corresponding Reactor Design for Li-S Battery Applications: *Jayaprakash Navaneethakrishnan*¹; ¹NOHMs Technologies

9:45 AM Invited

In Situ TEM Observation on Multiple-stripe Lithiation Process in Individual SnO₂ Nanowires: *Scott Mao*¹; Li Zhong¹; Jianyu Huang¹; ¹University of Pittsburgh

10:00 AM Break

10:15 AM Invited

Nanomaterials and Electrochemical Energy Storage: The Pros and the Cons: *Claude Delmas*¹; ¹ICMCB- CNRS

10:30 AM Invited

Nanoscale Materials for Energy Storage Systems: *Nader Hagh*¹; ¹400 Apgar drive

10:45 AM Invited

Phase Transformations Determine the Electrochemical Properties of Nanomaterials: *Jordi Cabana*¹; ¹University of Illinois at Chicago

11:00 AM Invited

Improved Electrochemical Energy Storage Devices Based on Layer-by-layer Spray Deposition: *Patrick Grant*¹; Chaopeng Fu¹; Laura O'Neill¹; Meng Jiang¹; Ann Huang¹; Beatriz Mendoza-Sanchez²; ¹Oxford University; ²CRANN, Trinity College Dublin

11:15 AM Invited

On the Evaluation Methods of Supercapacitors: *Ning Pan*¹; Sanliang Zhang¹; ¹University of California at Davis

11:30 AM Invited

Rational Design of Si-based Anodes for High Performance Lithium-ion Batteries: *Junhong Chen*¹; ¹University of Wisconsin-Milwaukee

11:45 AM Invited

Thin Films as a Platform for Understanding the Basic Mechanisms of FeF₂ Electrodes for Li-ion Batteries: *Nigel Shepherd*¹; Reinaldo Santos¹; Vyacheslav Volkov²; Yimei Zhu²; ¹University of North Texas; ²Brookhaven National Laboratory

12:00 PM

The Mechanism Interpretation by Energetic Band Diagram of Super P Carbon Black and Silicon Carbide in Si-based Lithium Ion Batteries: *Bing-Hong Chen*¹; Chun-Kai Lan¹; ¹Department of Materials Science and Engineering, National Tsing Hua University

Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World — Multi-Modal Monitoring of Structure Evolution*Sponsored by:* TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee*Program Organizers:* Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kosterz, ETH; Brent Fultz, California Institute of Technology; Peter Liaw, The University of TennesseeWednesday AM
February 19, 2014Room: 10
Location: San Diego Convention Center*Session Chairs:* E-Wen Huang, Central University; Ross Harder, Advanced Photon Source

8:30 AM Keynote

Metals under Complex Conditions: In-situ and real-time Information Revealt by Neutron and Synchrotron X-Ray Diffraction: *Klaus-Dieter Liss*¹; ¹Japan Atomic Energy Agency; Australian Nuclear Science and Technology Organisation

9:10 AM Invited

Multi-modal Tracking of Microstructure Responses: Combining Near-field Orientation Mapping, Far-field Strain Sensitivity, and Tomography in HEDM Measurements: *Robert Suter*¹; Frankie Li²; Joel Bernier²; Jay Schuren³; Paul Shade³; Peter Kenesei⁴; Jon Almer⁴; Ulrich Lienert³; Jon Lind¹; Reeju Pokharel¹; Anthony Rollett¹; ¹Carnegie Mellon University; ²Lawrence Livermore National Laboratory; ³Wright Patterson Air Force Base; ⁴Argonne National Laboratory; ⁵DESY Photon Source

9:35 AM Invited

Recent Neutron and Synchrotron Studies in Magnetic Shape Memory Alloys: *Jose Manuel Barandiaran*¹; Volodymyr Chernenko²; Maria Luisa Fdez-Gubieda¹; Patricia Lazpita¹; Akio Kimura³; ¹BCMATERIALS and University of the Basque Country (UPV/EHU); ²BCMATERIALS and Ikerbasque; ³Hiroshima University

10:00 AM Break

10:15 AM Invited

In Situ Neutron Diffraction Study of Shape Memory Alloys under Isothermal, Isobaric and Isostrain Loads: *Raj Vaidyanathan*¹; ¹UCF

10:40 AM Invited

New Intrinsic Mechanism on Gum-like Superelasticity of Multifunctional Alloys: *Yandong Wang*¹; Jiapeng Liu²; Yulin Hao³; Yunzhi Wang⁴; Zhihua Nie²; Dong Wang⁵; Yang Ren⁶; Rui Yang³; ¹University of Science and Technology; ²Beijing Institute of Technology; ³Shenyang National Laboratory for Materials Science; ⁴The Ohio State University; ⁵State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University; ⁶X-ray Science Division, Argonne National Laboratory

11:05 AM Invited

A General Formalism to Model the Diffraction Pattern of Layered and Faulted Materials: *Matteo Leoni*¹; Robert Koch¹; ¹University of Trento

11:30 AM

3-D Diffuse-scattering Characteristics of the Diffraction Spots of NiMnGa Ferromagnetic Shape-memory Alloys: *Gang Wang*¹; ¹Northeastern University

11:45 AM

State of Hydrogen and Deuterium in Electrochemically and Chemically Charged High Purity Aluminum: *Paul Rozenak*¹; ¹Hydrogen Energy Batteries, LTD

Pb-free Solders and Emerging Interconnect and Packaging Materials — Characterization and Assessment*Sponsored by:* TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee*Program Organizers:* Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch AutomoviteWednesday AM
February 19, 2014Room: 5B
Location: San Diego Convention Center*Session Chairs:* Robert Kao, National Taiwan University; Cheng-En Ho, Yuan-Ze University

8:30 AM

Characterization of Sn Crystal Orientation and Microstructure Evolution during Thermal Cycling in a Wafer Level Chip Scale Package Using EBSD and In Situ x-ray Diffraction: *Jason Zhou*¹; Bite Zhou¹; Thomas Bieler¹; Tae-kyu Lee²; ¹Michigan State University; ²Cisco Systems, Inc.

8:50 AM

Characterization of Sn Crystallographic Orientation and Cu₆Sn₅ Precipitates in Solder Joints at Small Volumes Using 3D Electron Backscatter Diffraction (EBSD): *Antony Kirubanandham*¹; Yang Jiao¹; Nikhilesh Chawla¹; ¹Arizona State University

9:10 AM

Void Migration in Cu Vias under Current Flow Detected by 3D X-ray Computed Tomography: Yan Li¹; Luhua Xu¹; Pilin Liu¹; Balu Pathangey¹; Mario Pacheco¹; Rajen Dias¹; Deepak Goyal¹; ¹Intel

9:30 AM

Synchrotron Radiation Micro Tomography Study of 3D Microelectronic Packages: John Elmer¹; Yan Li²; Holly Barth¹; Dula Parkinson³; Mario Pacheco²; Deepak Goyal²; ¹Lawrence Livermore National Laboratory; ²Intel Corporation; ³Lawrence Berkeley National Laboratory, ALS

9:50 AM

Effect of Grain Orientation on the Behavior of Thermomigration in Sn3.5Ag Solders: Wei-Neng Hsu¹; Fan-Yi Ouyang¹; ¹National Tsing Hua University

10:10 AM Break

10:30 AM

Mechanism of Mechanical Twinning in High Sn Alloys Induced by Thermal Strain: Huili Xu¹; Choong-un Kim; Tae-Kyu Lee²; Zhou Quan³; Thomas Bieler; ¹National Dong Hwa University; ²Cisco System Inc.; ³Michigan State University

10:50 AM

Coincident Site Lattice Boundaries Formed in Solidification and Deformation Twinning in Low-silver Solder Interconnects: Hongtao Chen¹; ¹Shenzhen Graduate School, Harbin Institute of Technology

11:10 AM

Vibrational Based Damage Analysis of Microelectronic Packages: Peyman Raffee¹; Golta Khatibi¹; Michael Nelhiebel²; Rainer Pelzer²; ¹University of Vienna; ²Infineon Technologies AG

11:30 AM

Evolution of Microstructure Characteristics across Sn-based Solder Joints under Simultaneous Thermal Cycling and Current Stressing: Yong Zuo¹; Limin Ma¹; Yutian Shu¹; Fu Guo¹; Andre Lee²; K. N. Subramanian²; ¹Beijing University of Technology; ²Michigan State University

Phase Transformation and Microstructural Evolution — Alloying, Grain Refinement, and Microstructural Evolution in Steels

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Wednesday AM
February 19, 2014

Room: 31C
Location: San Diego Convention Center

Session Chairs: Emmanuel DeMoor, Colorado School of Mines; Ning Ma, ExxonMobile Research & Engineering Company

8:30 AM Invited

Tensile Behavior of Intercritically Annealed 10%Mn Multi-phase Steel: Bruno De Cooman¹; ¹Pohang University of Science and Technology

9:00 AM

Obtaining Ultrafine-grained Austenite in a Cold-rolled Metastable Stainless Steel: Carola Celada¹; Jer-Ren Yang²; David San Martin¹; ¹CENIM-CSIC; ²National Taiwan University

9:20 AM Invited

Work Hardening and Austenite Stability in Ultra Fine Grained Medium-Mn TRIP Steels: Paul Gibbs¹; Bruno De Cooman²; Donald Brown¹; Bjørn Clausen¹; Matthew Merwin³; David Matlock⁴; ¹Los Alamos National Laboratory; ²Graduate Institute of Ferrous Technology, POSTECH; ³United States Steel Corporation; ⁴Advanced Steel Processing and Products Research

Center, Colorado School of Mines

9:50 AM

Microstructural Evolution of Ferrite Grains during Dynamic Transformation in 10Ni-0.1C Steel: Lijia Zhao¹; Nokeun Park¹; Akinobu Shibata¹; Nobuhiro Tsuji¹; ¹Kyoto University

10:10 AM Break

10:25 AM Invited

Nanoscale Martensite-to-austenite reversion at Grain Boundaries: A Pathway to Tough and Ductile Martensite: Dirk Ponge¹; Stefanie Sandlöbes¹; Julio Millán¹; Hamid Assadi¹; Michael Herbig¹; Pyuck-Pa Choi¹; Dierk Raabe¹; ¹Max-Planck-Institut für Eisenforschung GmbH

10:55 AM

Hot Deformation Behavior of an Fe-Al Steel in the Two Phase Region: Kenta Maeda¹; Tihe Zhou¹; Hatem Zurob¹; ¹McMaster University

11:15 AM Invited

Microalloyed High Carbon Wire Steels: Emmanuel De Moor¹; Stephanie Miller¹; ¹ASPPRC Colorado School of Mines

11:45 AM

Effect of Microstructural Evolution on the Mechanical Behavior of High Strength 560 MPa Linepipe Steels: Pavan Challa Venkata Surya¹; Devesh Misra¹; Murali Manohar²; Michael Mulholland²; Jack Hartmann²; ¹University of Louisiana at Lafayette; ²ArcelorMittal

12:05 PM

Role of Microalloying Precipitates in Grain Refinement and Dynamic Recrystallization in HSLA Steels: Deepak Kundalkar¹; Rajkumar Singh²; Asim Tewari¹; ¹IIT Bombay; ²KCTI, Bharat Forge

Progress Towards Rational Materials Design in the Three Decades Since the Invention of the Embedded Atom Method: An MPMD Symposium in Honor of Dr. Michael I Baskes — Advances in Atomistic Simulations - III

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Srinivasan Srivilliputhur, University of North Texas; Amit Misra, Los Alamos National Laboratory; Neville Moody, Sandia National Laboratories; Stephen Foiles, Sandia National Laboratories; Mark Asta, University of California; Alan Needleman, University of North Texas

Wednesday AM
February 19, 2014

Room: 30E
Location: San Diego Convention Center

Session Chairs: Mark Horstemeyer, Mississippi State University; Byeong-Joo Lee, Pohang University of Science and Technology; Mark Tschopp, Army Research Laboratory

8:30 AM Invited

Mesoscale Phase-field Modeling of Cr Segregation on Grain Boundaries in Fe-Cr Alloys under Irradiation: Shenyang Hu¹; Yulan Li¹; Fei Gao¹; Xin Sun¹; Chuck H. Henager Jr.¹; ¹Pacific Northwest National Laboratory

8:50 AM

Analytic Bond-order Potentials for Fe and Fe-C: Sebastian Schreiber¹; Miroslav Cak¹; Thomas Hammerschmidt¹; Ralf Drautz¹; ¹ICAMS, Ruhr-University Bochum

9:10 AM Invited

Using the (Modified) Embedded Atom Method for Studying Shock Processes in Materials Approaching Continuum Levels: Case Study of a Richtmyer-Meshkov Instability: Frank Cheme¹; ¹Los Alamos National Laboratory

9:30 AM

Molecular Dynamics Study of Voids and Bubbles in BCC Uranium: Benjamin Beeler¹; Chaitanya Deo²; Michael Baskes³; Maria Okuniewski⁴; ¹University of California, Davis; ²Georgia Institute of Technology; ³University of California, San Diego; ⁴Idaho National Laboratory



9:50 AM Break**10:10 AM**

Atomistic Modeling of Thermodynamic Properties of Pu-Ga Alloys Based on the Invar Mechanism: *Tongsik Lee*¹; Michael Baskes¹; A.C. Lawson¹; Steven Conradson¹; Shaoping Chen¹; Alfredo Caro¹; Steven Valone¹; Christopher Taylor¹; ¹Los Alamos National Laboratory

10:30 AM Invited

From First Principles Calculations to Low Fluence Irradiation Experiments in Uranium Alloys: *Maria Okuniewski*¹; ¹Idaho National Laboratory

10:50 AM

Role of Dislocation Junctions in Spall Initiation in Shocked Single Crystals: *Niraj Gupta*¹; Mike Baskes²; Srinivasan Srivilliputhur¹; ¹University of North Texas; ²Los Alamos National Laboratory

Radiation Effects in Oxide Ceramics and Novel LWR Fuels — Experimental Characterization of Radiation Effects in Oxide Ceramics

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

Program Organizers: Xian-Ming Bai, Idaho National Laboratory; Todd Allen, Idaho National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Jianliang Lin, Colorado School of Mines; Michele Manuel, University of Florida; Dragos STAICU, European Commission, Joint Research Centre, Institute for Transuranium Elements; Yong Yang, University of Florida

Wednesday AM Room: 33B
February 19, 2014 Location: San Diego Convention Center

Funding support provided by: The Center for Materials Science of Nuclear Fuel (CMSNF), an Energy Frontier Research Center led by the Idaho National Laboratory

Session Chairs: Todd Allen, Idaho National Laboratory; William Weber, University of Tennessee

8:30 AM Introductory Comments**8:35 AM Invited**

Irradiation Response of Fluorite-structured Oxides to Extreme Irradiation Conditions: *Yanwen Zhang*¹; Haiyan Xiao²; Ke Jin²; Caitlin Taylor²; Haizhou Xue²; Tamas Varga³; Fereydoon Namavar⁴; William Weber²; ¹Oak Ridge National Laboratory; ²University of Tennessee; ³Pacific Northwest National Laboratory; ⁴University of Nebraska Medical Center

9:05 AM

Damage Structure Evolution in Ion Irradiated UO₂: *Mahima Gupta*¹; Janne Pakarinen¹; Steven Conradson²; Jeff Terry³; Lingfeng He¹; Jian Gan⁴; Andrew Nelson²; Todd Allen⁴; ¹University of Wisconsin - Madison; ²Los Alamos National Lab; ³Illinois Institute of Technology; ⁴Idaho National Lab

9:25 AM

Ion-implantation Induced Nano-channels for Optical Waveguide in LiNbO₃: *Ritesh Sachan*¹; L. Peng²; G. Duscher²; Y. Zhang²; M. Chisholm¹; W. Weber¹; ¹Oak Ridge National Laboratory; ²University of Tennessee

9:45 AM

Ion Irradiation-induced Structural Transitions in Orthorhombic Ln₂TiO₅: *Jiaming Zhang*¹; Fuxiang Zhang²; Maik Lang²; Fengyuan Lu³; Jie Lian³; Rodney Ewing¹; ¹Stanford University; ²University of Michigan; ³Rensselaer Polytechnic Institute

10:05 AM Break**10:30 AM Invited**

Structural Defects in Uranium Dioxide: From Oxidation to Irradiation: *lional Desgranges*¹; ¹CEA

11:00 AM

The Role of Non-stoichiometry in the Radiation Damage Evolution of SrTiO₃: *Blas Uberuaga*¹; ¹Los Alamos National Laboratory

11:20 AM

Kr and Xe Bubble Characterization in CeO₂: Lingfeng He¹; *Janne Pakarinen*¹; Mahima Gupta¹; Jian Gan²; Yongqiang Wang³; Marquis Kirk⁴; Todd Allen¹; ¹University of Wisconsin-Madison; ²Idaho National Laboratory; ³Los Alamos National Laboratory; ⁴Argonne National Laboratory

11:40 AM

Nano-scale Irradiation Induced Chemistry Changes in Oxide Fuel Materials: *Billy Valderrama*¹; Hunter Henderson¹; Lingfeng He²; Janne Pakarinen²; Jian Gan³; Todd Allen²; Michele Manuel¹; ¹University of Florida; ²University of Wisconsin-Madison; ³Idaho National Laboratory

Rare Metal Extraction & Processing Symposium — Rhenium, Tin, Vanadium and SX Processing

Sponsored by: Associação Brasileira de Metalurgia, Materiais e Mineração – ABM, Chinese Society for Metals, Metallurgy and Materials Society of CIM, Institute of Materials, Minerals and Mining, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Neale Neelameggham, Ind LLC; Shafiq Alam, Memorial University of Newfoundland; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto, Kennecott Utah Copper Refinery

Wednesday AM Room: 16B
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Harald Oosterhof, Umicore; Brent Hiskey, University of Arizona

8:30 AM Introductory Comments**8:40 AM Invited**

Electrochemical Dissolution of Rhenium Bearing Super Alloy: Brent Hiskey¹; *John Snowberger*¹; ¹University of Arizona

9:00 AM

Sodium Stannate Preparation from Cassiterite Concentrate and Sodium Carbonate by Roasting under a CO/CO₂ Atmosphere: *Yuanbo Zhang*¹; Zijian Su¹; Zhixiong You¹; Bingbing Liu¹; Guang Yang¹; Guanghui Li¹; Tao Jiang¹; ¹Central South University

9:20 AM Invited

Dynamic Adsorption Behavior of Aqueous Vanadium onto Anion Exchange Resin: Cui Li¹; *Hong-Yi Li*¹; Liang Wang¹; Sheng-Kai An¹; Bing Xie¹; ¹Chongqing University

9:45 AM Invited

Ultrasonic-assisted Alkaline Leaching of Vanadium from Stone Coal: *Xuheng Liu*¹; Xingyu Chen¹; Jiangtao Li¹; Zhongwei Zhao¹; ¹Central South University

10:05 AM Break**10:25 AM**

Sodium Roasting Thermodynamics of Chromium-containing Vanadium Slag and Its Application: Hai-Xing Fang¹; *Hong-Yi Li*¹; Xin Li¹; Bing Xie¹; ¹Chongqing University

10:45 AM

Definition of the Process to Separate Light Rare Earths by Working with (2-Ethylhexyl)-Mono (2-Ethylhexyl) Ester Phosphonic Acid (P507) in a Mixler Settler Battery: *Alessandro Blasi*¹; Corradino Sposato¹; Giuseppe Devincenzi¹; Pietro Garzone¹; Massimo Morgana¹; ¹ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development

11:05 AM

Comparison Among Different Extractants, as (2-Ethylhexyl)-Mono (2-Ethylhexyl) Ester Phosphonic Acid (P507), Secondary-octyl Phenoxyl Acetic Acid (CA-12) and Bis(2,4,4-Trimethylpentyl)Phosphinic Acid (CYANEX272), in Heavy Rare Earths Separation via Hydrometallurgical Processes: *Corradino Sposato*¹; Alessandro Blasi¹; Giuseppe Devincenzi¹; Pietro Garzone¹; Massimo Morgana¹; ¹ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development

Shape Casting: 5th International Symposium — Process Design and Innovation

Sponsored by: TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS: Aluminum Committee, TMS: Solidification Committee
Program Organizers: Murat Tiriyakoglu, University of North Florida; John Campbell, University of Birmingham; Glenn Byczynski, Nemak Canada

Wednesday AM Room: 17B
February 19, 2014 Location: San Diego Convention Center

Session Chair: To Be Announced

8:30 AM Introductory Comments

8:35 AM

A Draft Melting Procedure for Al alloys: *John Campbell*¹; ¹University of Birmingham

8:55 AM

Effect of Casting Condition in Semi-solid Aluminum Alloy Injection Process on Distribution of Defects and Density: *Yuichiro Murakami*¹; Kenji Miwa²; Masayuki Kito³; Takashi Honda³; Naoyuki Kanetake⁴; Shuji Tada¹; ¹Advanced Industrial Science and Technology; ²Aichi Science and Technology Foundation; ³Aisan Industry Co., Ltd; ⁴Nagoya University

9:15 AM

Reliability-based Casting Process Design Optimization: Richard Hardin¹; K.K. Choi¹; *Christoph Beckermann*¹; ¹University of Iowa

9:35 AM

Influence of Process Parameters on Blistering during T6 Heat Treatment of Semi-solid Castings: *Youfeng He*¹; Xiaojing Xu¹; Fan Zhang¹; Daquan Li¹; Stephen Midson¹; Qiang Zhu¹; ¹General Research Institute for Nonferrous Metals

9:55 AM

Integrated Casting-heat Treatment Technology for Near Net Shape ADI Casting Production: *Mohamed El Mansori*¹; Anil Meena¹; ¹MSMPLaboratory

10:15 AM Break

10:30 AM

Swage Casting of A356 (AlSi7Mg0.3) Alloy: *Huseyin Lus*¹; ¹Yildiz Technical University

10:50 AM

Additive Manufacturing Supports the Production of Complex Castings: *Alan Druschitz*¹; Mary Seals¹; Dean Snelling¹; ¹Virginia Tech

11:10 AM

Evolution of Filling System Design for an A356 Aluminum Housing Casting: *Joseph Chvala*¹; Murat Tiriyakoglu¹; ¹University of North Florida

11:30 AM

Recent Advances on the Solidification Processing of Cast Energetic Materials: Ruslan Mudryy¹; Shian Jia²; *Laurentiu Nastac*²; ¹U.S. Army, RDECOM-ARDEC; ²The University of Alabama

Solid-state Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment — Oxides and Nanostructures II

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Xiang-Yang Liu, Los Alamos National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Stephen Foiles, Sandia National Laboratories; Mitra Taheri, Drexel University; Rampi Ramprasad, University of Connecticut

Wednesday AM Room: 4
February 19, 2014 Location: San Diego Convention Center

Session Chair: Rampi Ramprasad, University of Connecticut

8:30 AM Invited

Structural Distortions at Interfaces - The Interplay between Surface and Volume Free Energy: *David Johnson*¹; ¹University of Oregon

9:10 AM

Developing Nanoalloy Stability Diagrams to Guide the Sintering of Binary Nanocrystalline Alloys: Yuanyao Zhang¹; *Naixie Zhou*¹; Jian Luo¹; ¹University of California, San Diego

9:30 AM Invited

A Nanomolecular Approach for Tailoring Multiple Properties of Inorganic Heterointerfaces: *Ganpati Ramanath*¹; ¹Rensselaer Polytechnic Institute

10:10 AM Break

10:20 AM

Vacancy Structure and Mobility at Low-angle Twist Grain Boundaries in MgO: *Blas Uberuaga*¹; Kedarnath Kolluri¹; ¹Los Alamos National Laboratory

10:40 AM

Surface and Grain Boundary Segregation in Oxides: Implications for Stability of Nanocrystalline Oxides: *Pratik Dholabhai*¹; Blas Uberuaga¹; Longjia Wu²; Sanchita Dey²; Ricardo Castro²; ¹Los Alamos National Laboratory; ²University of California Davis

11:00 AM

Intra-variant Substructure in Ni₂MnGa Martensite: Conjugation Boundaries: *Brittany Muntifering*¹; Libor Kovarik²; R.C. Pond³; Nigel Browning²; Peter Müllner¹; ¹Boise State University; ²Pacific Northwest National Laboratory; ³University of Exeter

11:20 AM

Self-trapping at Surfaces and Interfaces of Functional Oxides: *Paul Erhart*¹; Andreas Klein²; Nina Balke³; ¹Chalmers University of Technology, Department of Applied Physics; ²Technische Universität Darmstadt, Institut für Materialwissenschaft; ³Oakridge National Laboratory

11:40 AM

Surface Chemical Defects on Sapphire Contributing Paramagnetic Noise to Superconducting Circuits: *Vincenzo Lordi*¹; Donghwa Lee¹; Jonathan DuBois¹; ¹Lawrence Livermore National Laboratory



Symposium on High Entropy Alloys II — Alloy Development and Applications

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Alloy Phases Committee

Program Organizers: Peter Liaw, The University of Tennessee; Gongyao Wang, University of Tennessee; M. C. Gao, National Energy Technology Laboratory; S. N. Mathaudhu

Wednesday AM
February 19, 2014

Room: 5A
Location: San Diego Convention Center

Session Chairs: Peter Liaw, The University of Tennessee; Suveen Mathaudhu

8:30 AM Invited

Potential Applications of High-entropy Materials: *Jien-Wei Yeh*¹; ¹National Tsing Hua University

8:50 AM

AlMnCrCuFeNi Multicomponent Alloy with Superior Hardness and Corrosion Resistance: Vasile Soare¹; Dumitru Mitrica¹; Ionut Constantin¹; Gabriela Popescu²; Ioana Csaki²; Mihai Tarcolea²; Ioan Carcea³; ¹National R&D Institute for Nonferrous and Rare Metals; ²Polytechnic University of Bucharest; ³Gheorghe Asachi Technical University of Iasi

9:00 AM Invited

High Entropy Multicomponent Alloys: *Brian Cantor*¹; ¹University of York

9:20 AM Invited

Development of BMG-forming High Entropy Alloy: Jin Yeon Kim¹; Hye Jung Chang²; Eun Soo Park¹; ¹Seoul National University; ²Korea Institute of Science and Technology

9:40 AM

High Entropy Alloy Coatings by Laser Processing: *Shravana Katakam*¹; Sanghita Mritha¹; Harpreet Arora¹; Sundeep Mukherjee¹; Narendra Dahotre¹; ¹University of North Texas

9:50 AM Break

10:10 AM Invited

The Search for Lower Density High Entropy Alloys: *James Cotton*¹; Ryan Glamm¹; Vanessa Venturella¹; Eric Pripstein¹; Michael Kaufman²; Abraham Munitz²; Ryan Oliver²; Rodinei Gomes³; Gerald Bourne²; Joseph Jankowski²; ¹Boeing; ²Colorado School of Mines; ³Universidade Federal da Parafba

10:30 AM

Characterization of Laser-deposited CoCrFeNi High Entropy Alloy Coatings: Siva priya Jaccani¹; Vamsi krishna Balla²; Ravi Sankar Kottada¹; Janaki ram Gabbita¹; ¹Indian Institute of Technology Madras (IIT Madras); ²Central Glass and Ceramics Research Institute (CGCRI)

10:40 AM Invited

Micro-segregation and Metastable Phase Stability of Cast Ti-Zr-Hf-Ni-Pd-Pt High Entropy Alloys: *Y. Yokoyama*¹; S. Itoh¹; Y. Murakami¹; I. Narita¹; G. Wang²; Peter Liaw²; ¹Institute for Materials Research; ²The University of Tennessee

11:00 AM

Phase Selection in Al-Cu-Ni-Ti-Zr Alloys: *Pratik Ray*¹; Tanner Thom²; Mufit Akinc²; Matthew Kramer¹; ¹Ames Laboratory, US-DOE; ²Iowa State University

11:10 AM Invited

Manufacturing High Entropy Alloys Using Traditional Melt Casting Techniques: *Paul Jablonski*¹; Jeffrey Hawk¹; ¹US Department of Energy

11:30 AM Invited

Development of High Entropy Superalloys: *An-Chou Yeh*¹; Te-Kang Tsao¹; Yao-Jen Chang¹; Jien-Wei Yeh¹; ¹National Tsing Hua University

Ultrafine Grained Materials VIII — Fundamental Deformation Phenomena

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Lavernia, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Wednesday AM
February 19, 2014

Room: 6E
Location: San Diego Convention Center

Session Chairs: Christopher Saldana, the Pennsylvania State University; M. Ravi Shankar, University of Pittsburgh

8:30 AM Invited

The Fine Line between Brittleness and Toughness in Severely Plastically Deformed Metals: *Anton Hohenwarter*¹; Reinhard Pippan²; ¹Department of Materials Physics, Montanuniversität Leoben, Austria; ²Erich Schmid Institute of Materials Science

8:50 AM Invited

Improved Tensile and Fatigue Properties of Nanocrystalline Cu and Cu-Al Alloys: *Zhefeng Zhang*¹; Xianghai An¹; Zhenjun Zhang¹; Peng Zhang¹; Shen Qu¹; Shiding Wu¹; ¹Institute of Metal Research

9:10 AM Invited

Strain and Stress Partitioning in Ultrafine Grained Ferrite/Martensite Steel: *Cem Tasan*¹; Dirk Ponge¹; Johan Hoefnagels²; Dingshun Yan¹; Martin Diehl¹; Franz Roters¹; Marion Calcagnotto³; Dierk Raabe¹; ¹Max-Planck Institute for Iron Research; ²Eindhoven University of Technology; ³Salzgitter Mannesmann Forschung GmbH

9:30 AM

Stress-driven Grain Growth during Stress-relaxation in Nanocrystalline Ni: *Yong Zhang*¹; Jessica Krogstad¹; Kevin Hemker¹; ¹Johns Hopkins University

9:45 AM

Maps of Microstructures Resulting from Severe Shear: *M. Ravi Shankar*¹; Sepideh Abolghasem¹; Saurabh Basu¹; ¹University of Pittsburgh

10:00 AM Break

10:15 AM Invited

Transient Plastic Phenomena in Large Strain Deformation: Fei Du¹; Cesar Moreno¹; *Christopher Saldana*¹; ¹The Pennsylvania State University

10:35 AM Invited

The Role of Copper Twin Boundaries in Cryogenic Indentation-induced Grain Growth: Justin Brons¹; Henry Padilla II²; Khalid Hatter²; Brad Boyce²; *Gregory Thompson*¹; ¹University of Alabama; ²Sandia National Laboratories

10:55 AM

Quantifying the Role of Grain Boundary Energetics and Texture on the Strength of Ultrafine Grained Materials: *Lei Cao*¹; Marisol Koslowski¹; ¹Purdue University

11:10 AM

Interface Controlled Plasticity in Nanocrystalline Alloys: *Karsten Albe*¹; Jonathan Schäfer¹; Alexander Stukowski¹; ¹TU Darmstadt

11:25 AM Invited

Study of SPD Induced Lattice Defects and Their Effects to Strength before and during Annealing: *Michael Zehetbauer*¹; Peter Cengeri¹; Ismar Mulalic¹; Daria Setman¹; Florian Spieckermann¹; Erhard Schafner¹; Bartosz Sulkowski²; Borys Mikulowski²; ¹University of Vienna; ²AGH University of Science and Technology

11:45 AM

Hollow Cone High-pressure Torsion: *Hyoung Seop Kim*¹; Ho Yong Um¹; ¹POSTECH

Ultrafine Grained Materials VIII — Stability of Nanomaterials

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Laverna, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Wednesday AM Room: 6F
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Ying Chen, Rensselaer Polytechnic Institute; Heather Murdoch, U.S. Army Research Laboratory

8:30 AM Invited

Tailoring Mechanical Behavior and Stress-driven Grain Growth of Nanocrystalline Thin Films via Alloying: Mo-rigen He¹; Peter Felfer²; Saritha Samudrala²; Joel Lefever¹; Suman Dasgupta³; Kevin Hemker³; Julie Cairney²; Daniel Gianola¹; ¹University of Pennsylvania; ²University of Sydney; ³Johns Hopkins University

8:50 AM Invited

Cu/Nb Nanocomposite Metallic Wires Processed by Severe Plastic Deformation: Effects of the Nanostructure on the Resistance to Extreme Environment (High Strain, High Stress, High Temperature): Ludovic Thilly¹; Jean-Baptiste Dubois¹; Pierre-Olivier Renault¹; Florence Lecouturier²; ¹University of Poitiers; ²LNCMI

9:10 AM Invited

Stability of Nanostructured Metals at High Temperature and Against Radiation: Xinghang Zhang¹; Y. Chen¹; D. Bufford¹; K.Y. Yu¹; C. Sun²; H. Wang¹; ¹Texas A&M University; ²Los Alamos National Laboratory

9:30 AM

Nanoscale Precipitation, Recovery and Grain Growth in ODS Steel Particles: Nicolas Sallez¹; Laurent Couturier¹; Frédéric de Geuser¹; Alexis Deschamps¹; Frédéric Delabrouille²; Martine Blat-Yrieix²; Patricia Donnadieu¹; Yves Bréchet¹; ¹CNRS; ²EDF

9:45 AM

Mesoscale Modeling of Nanocrystalline Structural Evolutions under Thermal-mechanical Influences: Ying Chen¹; ¹Rensselaer Polytechnic Institute

10:00 AM Break

10:15 AM Invited

Bulk Consolidation of Nanostructured Cu-Ta Alloys: Kris Darling¹; Laszlo Kecskes²; A. Roberts²; Deepak Kapoor; Suveen Mathaudhu; T. Zahrah³; ¹ARL; ²US Army Research Laboratory; ³MATSYS Corporation

10:35 AM Invited

High Strain Rate Properties of Nanostructured Cu-Ta Alloys: Laszlo Kecskes¹; Kris Darling; ¹US Army Research Laboratory

10:55 AM

Quasi-static and Dynamic Mechanical Properties of Nanostructured Copper Doped with Tantalum: Weihua Yin¹; Kristal Darling²; Laszlo Kecskes²; Qiuming Wei¹; ¹University of North Carolina at Charlotte; ²US ARL

11:10 AM

Microstructures and Mechanical Properties of Ultrafine Grained and Nanostructured Cu after Annealing: Nairong Tao¹; Y. Zhang¹; Y.S. Li¹; K. Lu¹; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences

11:25 AM

Effect of Diamantane Nanoparticles on the Thermal Stability of Cryomilled 5083 Aluminum: Walid Hanna¹; Khinlay Maung¹; Mohammed Enayati¹; James Earthman¹; Farghalli Mohamed¹; ¹University of California, Irvine

11:40 AM Invited

Processing Routes for Ultrafine Grained Magnesium MgZn₁Y₂ Alloy: D Kapoor¹; R. Sadangi¹; T. Zahrah²; R. Tandon³; D. Madan³; ¹US Army ARDEC;

²Matsys Inc; ³Magnesium Elektron Powder Products

2014 Functional Nanomaterials: Synthesis, Properties and Applications — Magnetic Nanomaterials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Wednesday PM Room: Ballroom D
February 19, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Nitin Chopra, The University of Alabama; Yuanbing Mao, University of Texas - Pan American; Stephan Turano, Georgia Tech Research Institute

2:00 PM Invited

Spintronics for Integrated Circuits: Scalable Magnetic Nanostructures for Energy-efficient System-on-Chip: Seung Kang¹; ¹Qualcomm Technologies Inc.

2:30 PM

Bit Patterned Media Using Block Copolymer Templating on FePt: Allen Owen¹; Hao Su¹; Robert Douglas¹; Angeliq Montgomey¹; Subhadra Gupta¹; ¹The University of Alabama

2:50 PM

Antiferromagnetic Thickness Dependence of Blocking Temperature in Exchange Coupled SFMO/SFWO Multilayers: Deepak Kumar¹; Davinder Kaur²; ¹Graphic Era University Dehradun; ²IIT Roorkee

3:05 PM

Domain Wall Motion during Mechanical Depoling in the Ferroelectric Ceramic (1-x)(Na_{0.5}Bi_{0.5})TiO₃-xBaTiO₃ (NBT-BT): Lyndsey Denis¹; Julia Glaum²; Mark Hoffman²; John Daniels²; Jennifer Forrester¹; Ryan Hooper¹; Michele Manuel¹; Jacob Jones¹; ¹University of Florida; ²University of New South Wales

3:25 PM

High Magnetic Coercivity Associated with Nanoscale Phase Transformations in Near-eutectoid Co-Pt Alloys: Priya Ghatwai¹; Mark Hrdy¹; Thanakorn Iamsasri¹; Eric Vetter¹; William Soffa¹; Jerrold Floro¹; ¹University of Virginia

3:45 PM Break

4:05 PM

Structure and Magnetocaloric Effect of Pr₂Fe₁₇-xAlx: Lotfi Bessais¹; Rym Guetari¹; Riadh Bez¹; Karim Zehani¹; Najeh Mliki²; Corneliu Cizmas³; ¹CNRS; ²LMOP; ³Department of Electrical Engineering and Applied Physics,

4:20 PM

Galvanic Coupling of Ferromagnetic and Silver Nanoparticles for Stable Plasmons: Abhinav Malasi¹; Jingxuan Ge¹; Ritesh Sachan¹; Hernando Garcia²; Anup Gangopadhyay³; Gerd Duscher¹; Ramki Kalyanaraman¹; ¹University of Tennessee, Knoxville; ²Southern Illinois University Edwardsville; ³Washington University, St. Louis

4:40 PM

High Magnetic Moment CoFe Nanoparticles: Lotfi Bessais¹; Karim Zehani¹; Riadh Bez¹; Jacques Moscovici¹; Hassan Lassri²; El Kebir Hli³; Najeh Mliki⁴; ¹CNRS; ²University Hassan 2; ³Institut Neel CNRS; ⁴LMOP

5:00 PM

On the Study of Nanocrystalline Pr-Co Systems: Najeh Mliki¹; Riadh Fersi¹; Lotfi Bessais²; ¹LMOP, Faculty of Science of Tunis, University of Tunis El Manar; ²CMTR, ICMPE, UMR7182, CNRS, Université Paris Est

5:20 PM

Structural and Magnetic Properties of Nanocrystalline Pr₂Co₇Cx and Pr₂Co₇Hy Alloys: Lotfi Bessais¹; Riadh Fersi²; Najeh Mliki²; ¹CNRS; ²LMOP



2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications — Nanomaterials for Device Applications and Nanometal III-Deformation Mechanisms

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Nuggeshalli Ravindra, New Jersey Institute of Technology; Ramki Kalyanaraman, University of Tennessee; Haiyan Wang, Texas A&M University; Yuntian Zhu, North Carolina State University; Justin Schwartz, North Carolina State University; Amit Goyal, Oak Ridge National Laboratories

Wednesday PM
February 19, 2014

Room: Ballroom E
Location: San Diego Marriott Marquis & Marina

Session Chairs: R. Katiyar, University of Puerto Rico; Somuri Prasad, Sandia National Laboratories

2:00 PM Invited

Nanoengineered Binary and Ternary Heavy Metal Selenides for MWIR Detectors: *Narsingh Singh*¹; ¹University of Maryland, Baltimore County

2:20 PM Invited

Electronically-active Silicon Nanophotonic Structures for Nonlinear Optics on a CMOS-compatible Chip: *Shayan Mookherjee*¹; ¹UC San Diego

2:40 PM Invited

Fabrication, Characterization, and Mechanism of Vertically Aligned Titanium Nitride Nanowires: Seyram Gbordzoe¹; Mainul Faruque¹; Kwadwo M-Darkwa¹; Zhigang Xu; *Dhananjay Kumar*²; ¹North Carolina Agricultural and Technical State University; ²North Carolina A & T State University

3:00 PM Invited

Novel Bimetallic Plasmonic Nanomaterials: *Ritesh Sachan*¹; R. Kalyanaraman²; G. Duscher²; ¹Oak Ridge National Laboratory; ²University of Tennessee

3:20 PM

Hollow Fiber Solar Cells: Processing, Morphology, and Property Correlations: Tyler Smith¹; *Abhinav Malasi*¹; Hernando Garcia²; Gerd Duscher¹; Ramki Kalyanaraman¹; ¹University of Tennessee, Knoxville; ²Southern Illinois University Edwardsville

3:40 PM Break

4:00 PM Invited

The Hall-petch Based Dislocation Mechanics of Nanopolycrystal Plasticity: *Ronald Armstrong*¹; ¹University of Maryland

4:20 PM Invited

Modeling of Grain Boundaries in Nanostructured Alloys: Structure, Stability and Dynamics: Shijing Lu¹; *Donald Brenner*¹; ¹North Carolina State University

4:40 PM Invited

The Role of Interfaces on the Deformation Behavior of Nanocrystalline Thin Films and Bulk Materials: *Mathias Göken*¹; ¹Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

5:00 PM Invited

Friction Behavior of Nanocrystalline Metals: The Role of Subsurface Grain Structures: *Somuri Prasad*¹; Corbett Battaile¹; Henry Padilla¹; Brad Boyce¹; Paul Kotula¹; ¹Sandia National Laboratories

5:20 PM Invited

3D TEM Characterization of Nanocrystalline Metal Thin Films: *Xiaoxu Huang*¹; S. Schmidt¹; P. Larsen¹; H. H. Liu²; A. Godfrey³; Z. Q. Liu⁴; ¹Technical University of Denmark; ²California Institute of Technology; ³Tsinghua University; ⁴Institute of Metal Research

5th International Symposium on High Temperature Metallurgical Processing — Simulation and Modeling

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

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Mark Schlesinger, Missouri University of Science and Technology; Onuralp Yücel, ITU; Rafael Padilla, University of Concepcion; Phillip Mackey, P.J. Mackey Technology; Guilfeng Zhou, Wuhan Iron and Steel

Wednesday PM
February 19, 2014

Room: 18
Location: San Diego Convention Center

Session Chairs: Phillip Mackey, P.J.Mackey Technology Inc; Mingjun Rao, Central South University

2:00 PM Introductory Comments

2:05 PM

Thermochemical Simulation of Cu-Ni Smelting Operations: Karri Penttilä¹; *Justin Salminen*¹; Nagendra Tripathi²; Pertti Koukkari¹; ¹VTT; ²Glencore-Xstrata Koniambo Nickel

2:20 PM

Impact of Concentrate Feed Temporal Fluctuations on a Copper Flash Smelting Process: *Alexandre Lamoureux*¹; Adam Blackmore¹; Maciej Jastrzebski¹; ¹Hatch Ltd.

2:35 PM

Influence of Microwave Radiation on Phosphorus-removal Process of Oolitic High-phosphorus Iron Ore Fines: *Huiqing Tang*¹; ¹University of Science and Technology Beijing

2:50 PM

Mathematical Modeling for Developing Iron Bath Reactor with H₂-C Mixture Reduction: *Bo Zhang*¹; Huai-wei Zhang¹; Jie-nan Liu¹; Li-sheng Liang²; Dong-yan Wang²; Yan-feng Yang³; Hua-ling Guo³; Xin Hong¹; ¹Shanghai University; ²Baosteel Co.,Ltd; ³Guiyang Vocational and Technical College

3:05 PM

Optimization System of Iron Ores Proportion for Sintering Process: *Xiaohui Fan*¹; Xiaoxian Huang¹; Xuling Chen¹; Min Gan¹; ¹Central South University

3:20 PM

Numerical Simulation Study on Immersed Side-blowing in C-H₂ Smelting Reduction Furnace: *Kongfang Feng*¹; Jieyu Zhang¹; Bo Wang¹; Jun Xu¹; Jinyin Xie¹; Weiling Cheng¹; Deyou Yin¹; Shaobo Zheng¹; ¹Shanghai University

3:35 PM Break

3:45 PM

Study of Mixing Phenomena during RH Refining Using Water Modeling: *Lifeng Zhang*¹; ¹University of Science and Technology Beijing

4:00 PM

Modeling and CFD Simulation of Multiphase Melt Flows in Steelmaking Oxygen Converters during Top Blow: *Varadarajan Seshadri*¹; Carlos Antônio da Silva²; Itavahn alves da Silva²; Bruno Sandburg de Castro Lima²; Camila Goes Mattioli²; Marco Tulio Carmozine Prado²; Eliana Ferreira Rodrigues²; ¹Universidade Federal de Minas Gerais; ²Department of Metallurgical Engineering, Federal University of Ouro Preto Campus do Morro do Cruzeiro S/N

4:15 PM

Modeling and CFD Simulations of Multiphase Melt Flows in Steelmaking Converters under Combined Blow Conditions: *Varadarajan Seshadri*¹; Carlos Antônio da Silva²; Itavahn Alves da Silva²; Bruno Sandburg de Castro Lima²; Camila Goes Mattioli²; Marco Tulio Carmozine Prado²; Eliana Ferreira Rodrigues²; ¹Department of Metallurgical Engineering and Materials Universidade Federal de Minas Gerais; ²Department of Metallurgical Engineering, Federal University of Ouro Preto

4:30 PM

Factors Affecting the Mixing Characteristics of Molten Steel in the RH Refining Process: *Minren Xu*¹; Qingcai Liu¹; Jian Yang¹; Dongran Ma¹; Bing Hu¹; Yuanpei Lan¹; Deliang Niu¹; ¹Chongqing University

4:45 PM

Numerical simulation on temperature distribution and microstructure growth of Horizontal Unidirectional Solidification Equipment: Bai Liang¹; Zhong Honggang¹; Wang Bo¹; Zhai Qijie¹; Zhang Jieyu¹; ¹Shanghai University

4:55 PM

Large Eddy Simulation for Turbulent Flow in a Dissipative Ladle Shroud: *Jiangshan Zhang*¹; Jingshe Li¹; ¹University of Science and Technology Beijing

5:05 PM

Study on the Shape of the Cohesive Zone in PanZhiHua Steel Based on the Cluster Analysis: *Hongwei Guo*¹; ¹University of Science and Technology Beijing

A Lifetime of Experience with Titanium Alloys: An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer — Boyer Honorary Session II: Structure/Property Correlations

Sponsored by: TMS Structural Materials Division, TMS: Titanium Committee
Program Organizers: Adam Pilchak, Air Force Research Laboratory; James Larsen, Air Force Research Laboratory; David Dye, Imperial College London; Jay Tiley, Air Force Research Laboratory

Wednesday PM
February 19, 2014

Room: 1A
Location: San Diego Convention Center

Session Chairs: Sushant Jha, Universal Technology Corporation; Robert Briggs, Boeing

2:00 PM

Microstructure - Its Effect on Fracture Toughness and Tensile Properties of Ti-5Al-5Mo-5V-3Cr (Ti5553) Alloy: *Sujoy Kar*¹; Swati Suman¹; Atasi Ghosh¹; Amit Bhattacharjee²; Dipankar Banerjee³; ¹Indian Institute of Technology, Kharagpur; ²Defence Metallurgical Research Laboratory; ³Indian Institute of Science, Bangalore

2:20 PM **Invited**

Advances in Structure-property Relationships in Titanium Alloys: Iman Ghamarian¹; Vikas Dixit¹; Hamish Fraser¹; Rajarshi Banerjee¹; *Peter Collins*¹; ¹University of North Texas

2:50 PM

Fatigue Behavior of Laser Shock Peened Ti-6Al-4V ELI and Ti6242 Alloys: Sagar Bhamare¹; Sethu Subramanian²; Gokul Ramakrishnan³; Zhong Zhou⁴; David Kirschman⁵; Kristina Langer⁶; Seetha Mannava⁷; Dong Qian⁴; *Vijay Vasudevan*⁷; ¹Innova Engineering, Inc.; ²Cummins, Inc.; ³Applied Thermal Technologies; ⁴University of Texas at Dallas; ⁵X-spine Systems, Inc.; ⁶Air Force Research Laboratory; ⁷University of Cincinnati

3:10 PM

Studying Fatigue Using Diffracted X-ray intensity Profiles and a Crystal-based Finite Element Model: *Mark Obstalecki*¹; Su Leen Wong¹; Matthew Miller¹; Paul Dawson¹; ¹Cornell University

3:30 PM **Break**

3:50 PM

Effect of Microstructure on the Life-limiting Fatigue Mechanisms in Titanium Alloys: *Sushant Jha*¹; Christopher Szczepanski²; Patrick Golden²; Alisha Hutson³; Reji John²; James Larsen²; ¹Air Force Research Laboratory/Universal Technology Corporation; ²Air Force Research Laboratory; ³University of Dayton Research Institute

4:10 PM

Effect of Heat Treatment on Microstructure and Abrasive Wear of Ti-6Al-4V Alloy: *Shreyash Hadke*¹; Shreyans Jain¹; Rajesh Khatirkar¹; S Sapate¹; ¹Visesvaraya National Institute of Technology

4:30 PM

Grain Refinement in Ti-6Al-4V Alloy During Thermomechanical processing and Investigation of Flow Properties: *Digvijay Sheed*¹; Bhagawati Kashyap²; Rajkumar Singh¹; ¹Bharat Forge Ltd. Pune; ²Indian Institute of Technology, Bombay

4:50 PM

A Study on Microstructures and Hardening Behaviors of Ti-12.1Mo-1Fe Alloy: *Chenglin Li*¹; Dong-Geun Lee²; Xujun Mi¹; Wenjun Ye¹; Yongtai Lee²; ¹General Research Institute for Nonferrous Metals; ²Korea Institute of Materials Science

5:10 PM

Structure-property Correlation in an Aircraft Sheet Metal Alloy Ti-15V-3Cr-3Al-3Sn: *Santhosh Rajaraman*¹; Geetha Manivasagam¹; Vikas Kumar²; Nageswara Rao M¹; ¹VIT University Vellore, India; ²Defence Metallurgical Research Laboratory, Hyderabad

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling — Fuels

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

Program Organizers: Peter Hosemann, University of California Berkeley; Julie Tucker, Knolls Atomic Power Laboratory; James Cole, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Wednesday PM
February 19, 2014

Room: 33C
Location: San Diego Convention Center

Session Chair: James Cole, Idaho National Laboratory

2:00 PM

Advanced Nuclear Fuel Concepts for Minor Actinide Burning: *Manuel Pouchon*¹; ¹Paul Scherrer Institute

2:40 PM

Phase Stability and Evolution of Ion-irradiated Uranium-rich Alloys for Advanced Nuclear Fuels: *Joseph McKeown*¹; Sangjoon Ahn²; Sandeep Irukuvarghula²; Mark Wall¹; Thomas Brown¹; Scott Tumey¹; Luke Hsiung¹; Michael Fluss¹; Sean McDevitt²; Patrice Turchi¹; ¹Lawrence Livermore National Laboratory; ²Texas A&M University

3:00 PM

Mechanism of Irradiation-induced Creep in Ultra-fine Grain Graphite: *Anne Campbell*¹; Gary Was¹; ¹University of Michigan

3:20 PM

Examination of Radiation Damage in ZrC Using EXAFS: *Jeff Terry*¹; Daniel Olive²; Hasitha Ganegoda¹; Todd Allen³; Yong Yang⁴; Clayton Dickerson⁵; ¹Illinois Institute of Technology; ²University of California, Berkeley; ³University of Wisconsin, Madison; ⁴University of Florida; ⁵Argonne National Laboratory

3:40 PM **Break**

4:00 PM

Viability of SiC/SiC Composites as LWR Cladding: Bridging Experiments and Fuel Performance Modeling: *Kurt Terrani*¹; Yutai Katoh¹; Lance Snead¹; ¹Oak Ridge National Laboratory

4:40 PM

Radiation Response of Silicon Carbide under In-situ Electron Irradiation: *Laura Jamison*¹; Ming-Jie Zheng¹; Kumar Sridharan¹; Todd Allen¹; Dane Morgan¹; Izabela Szlufarska¹; ¹University of Wisconsin-Madison

5:00 PM

Ion Beam Experiment to Simulate Simultaneous Molten Salt Corrosion and Fast Neutron Damage for Advanced Fuel Cycles: *Elizabeth Sooby*¹; Magda De Caro²; Robert Houlton²; Feng Lu¹; Peter McIntyre¹; Nathaniel Pogue¹; Akhdiyov Sattarov¹; Joseph Tesmer²; Yongqiang Wang²; ¹Texas A&M University; ²Los Alamos National Laboratory



Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion II — High Performance Soft Magnets I (This is a joint session with Magnetic Materials for Energy Applications IV)

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee, TMS: Magnetic Materials Committee
Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael McHenry, Carnegie Mellon University; Matthew Willard, Case Western Reserve University; Rachael Myers-Ward, NRL; Mike Lanagan, Penn State University; Clive Randall, Penn State University

Wednesday PM
 February 19, 2014

Room: Ballroom G
 Location: San Diego Marriott Marquis & Marina

Session Chairs: Matthew Willard, Case Western Reserve University; Michael McHenry, Carnegie Mellon University

2:00 PM Joint Session with Magnetic Materials for Energy Applications. A joint session with the Magnetic Materials for Energy Applications symposium is planned. This session will be held in Ballroom G of the Marriott. For complete session details, turn to the Magnetic Materials for Energy Applications entry in the program book or online.

2:00 PM Invited: Magneto-optical Analysis of Magnetic Microstructures; presented by Rudolf Schaefer, Leibniz Institute for Solid State and Materials Research (IFW) Dresden

2:30 PM Invited

Processing of Soft Magnetic Alloys in High Magnetic Field; presented by Sophie Rivoirard, CNRS/CRETA

3:00 PM Invited

Recent Advancements in Modeling of Hysteretic Phenomena; presented by Yevgen Melikhov, Cardiff University

3:30 PM Break

3:45 PM

Nano-magnetism of bcc Fe-based Solid Solutions; presented by Manfred Wuttig, University of Maryland

4:05 PM Invited

Tailoring of Magnetic Properties and GMI Effect in Thin Amorphous Wires; presented by Arcady Zhukov, Basque Country University and IKERBASQU

4:35 PM

Soft Magnetic Rapidly Solidified Bilayer Ribbons for Energy Applications; presented by Ivan Skorvanek, Institute of Experimental Physics; ²Institute of Physics

4:55 PM

Student: Atomic Scale Analysis of Rapid Annealing Induced Fe-Si Nanocrystals with Strong Creep Induced Anisotropy; presented by Pradeep Konda Gokuldoss, Max Planck Institute for Iron Research GmbH

5:15 PM

Effects of Elastic Interactions on Domain Structures in Terfenol-D; presented by Ben Wang, Michigan Technological University

Advanced Materials in Dental and Orthopedic Applications — Corrosion and Tribocorrosion Behavior of Orthopedic/Dental Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Hanson Fong, University of Washington; Mathew Mathew, Rush University Medical Center; Cortino Sukotjo, University of Illinois at Chicago

Wednesday PM
 February 19, 2014

Room: 32B
 Location: San Diego Convention Center

Session Chairs: Mathew Mathew, Rush University Medical Center at Chicago; Tolou Shokuhfar, Michigan Technological University

2:00 PM Invited

On the Relevance of Bio-tribocorrosion Phenomena in Dental and Orthopedic Applications: An Overview: *Luis Rocha*¹; Fernando Oliveira²; Helena Cruz²; Maria Joao Runa²; Sofia Alves²; Ana Rosa Ribeiro³; José Mauro Granjeiro³; ¹UNESP, Univ. Estadual Paulista, Faculdade de Ciências; ²CT2M - Centre for Mechanical and Materials Technologies; ³INMETRO - Instituto Nacional de Metrologia, Normalização e Qualidade Industrial

2:30 PM

Damage Analysis of a Used Co-Cr-based Metal-on-metal Hip Joint Bearing: Comparisons with a Newly Developed Co-Cr-Mo-N Alloy: *Yuichiro Koizumi*¹; Chen Yan¹; Takuya Mitsunobu¹; Akihiko Chiba¹; Shu-Ichiro Tanaka¹; Yoshihiro Hagiwara¹; ¹Tohoku University

2:45 PM

Mechanical and Corrosion Property Study of Zn modified Mg-Ca Alloys as Biodegradable Orthopedic Materials: *Zhigang Xu*¹; Christopher Smith¹; Lisa Ferrara²; Yongjun Chen¹; Jag Sankar¹; ¹NC A&T State University; ²OrthoKinetic Technologies, LLC

3:00 PM

Influence of Albumin on the Corrosion Behaviour of Zr in Phosphate Buffered Saline Solutions: *Luning Wang*¹; ¹University of Science and Technology Beijing

3:15 PM Invited

Adverse Tissue Response to Corrosion and Products of Corrosion in CoCr Dual-modular Neck Hip Prostheses: *Deborah Hall*¹; Robert Urban¹; Joshua Jacobs¹; ¹Rush University Medical Center

3:45 PM Break

4:05 PM Invited

Influence of Cold Rolling on Microstructure and the Passive Film of the NBR ISO 5832-1 Austenitic Stainless Steel: *Alexander Ramirez*¹; Cristiaann Hincapie Ramirez¹; Isolda Costa¹; ¹Instituto de Pesquisas Energéticas e Nucleares

4:35 PM

Corrosion and In Vitro Biocompatibility Properties of Cryomilled-spark Plasma Sintered Commercially Pure Titanium: *Shehreen Dheda*¹; Yoon Kim¹; Christopher Melnyk²; Wendy Liu¹; Farghalli Mohamed¹; ¹University of California, Irvine; ²California Nanotechnologies, Inc.

4:50 PM

Surface Amorphization of NiTi Shape Memory Alloy by Advanced Surface Treatment for Improved Corrosion Resistance and Biocompatibility: *Chang Ye*¹; Abhiehek Telang²; Amrinder Gill²; Zhong Zhou³; Seetha Mannava²; Dong Qian³; Vijay Vasudevan²; ¹University of Akron; ²University of Cincinnati; ³University of Texas at Dallas

5:05 PM

In Vitro Corrosion Resistance, Mechanical Behavior and Biocompatibility of Ti-Mo-Zr-Fe and Ti-Mo-Nb-Fe Alloys for Orthopedic Implants: A Comparative Assessment: *Vishal Musaramthota*¹; *Sushma Amruthaluri*¹; *Amit Datye*²; *Chandan Pulletikurthi*¹; *Dwayne McDaniel*³; *Norman Munroe*¹; ¹Florida International University; ²The University of Tennessee; ³Applied Research Centre

Advances in Surface Engineering: Alloyed and Composite Coatings III — Joint Session II: Recent Developments in Biological, Electronic, and Functional Thin Films and Coatings

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee

Program Organizers: Sandip Harimkar, Oklahoma State University; Jeff De Hosson, Univ of Groningen; Roger Narayan, University of North Carolina and North Carolina State University; Efsthios (Stathis) Meletis, University of Texas at Arlington; Virendra Singh, Schlumberger Rosharon Campus; Srinivasa Bakshi, Indian Institute of Technology-Madras; Mathieu Brochu, McGill University; Arvind Agarwal, Florida International University; Jian Luo, UC San Diego; Nancy Michael, University of Texas at Arlington; Nuggehalli Ravindra, New Jersey Institute of Technology; Adele Carrado, IPCMS; Choong-un Kim, University of Texas at Arlington; Amit Pandey, Rolls Royce LG Fuel Cell

Wednesday PM
February 19, 2014

Room: 1B
Location: San Diego Convention Center

Session Chair: Roger Narayan, University of North Carolina and North Carolina State University

2:00 PM **Invited**

Nanoscale Building Blocks for Electronics and Photonics: *Federico Rosei*¹; ¹INRS

2:25 PM

High Temperature Characterization of Silicon Dioxide Films: *Megan Cordill*¹; *Stephan Bigl*²; *Walter Heinz*²; *Markus Kahn*³; *Helmut Schoenherr*³; *Reinhard Pippan*¹; ¹Erich Schmid Institute of Materials Science; ²Kompetenzzentrum Automobil- und Industrie-Elektronik GmbH; ³Infineon Technologies Austria AG

2:40 PM

Resistance Switching of Electrodeposited Cuprous Oxide Thin Films: *Sanaz Yazdanparast*¹; *Jakub Koza*¹; *Jay Switzer*¹; ¹Missouri University of Science and Technology

2:55 PM

Characterization of Coatings for Electroformed Cold Shields Developed for Optoelectronic Applications: *Burcu Arslan*¹; *Gökhan Demirci*²; *Ishak Karakaya*¹; *Metehan Erdogan*¹; ¹Middle East Technical University; ²Aselsan Inc. MGEO Division

3:10 PM **Invited**

Processing of Highly Emissive CZ-Silicon by Depositing Stressed Sol-gel Films: *Sufian Abedrabbo*¹; *Bashar Lahlouh*; *Anthony Fiory*; *Nuggehalli Ravindra*; ¹University of Jordan

3:35 PM **Break**

3:50 PM **Invited**

Correlation of Structural Morphology Evolution to Restoration of Plasma-induced Damage in Porous Low-k Dielectrics: *Yoonki Sa*¹; *Todd Ryan*²; *Sean King*³; *Choong-Un Kim*¹; ¹UTA; ²Globalfoundries; ³Intel Co.

4:15 PM

Process Optimization of Reactively Sputtered Aluminum Nitride Piezoelectric Thin Films for Elevated Temperature Applications: *Masood Hasheminasari*¹; *Jianliang Lin*¹; *John Scales*¹; *John Moore*¹; ¹Colorado School of Mines

4:30 PM

Transparent Composite Electrode (TCE) for ITO-free, PEDOT:PSS-free Bulk-heterojunction Organic Solar Cells: *Hyung Choi*¹; *N. Theodore*²; *Terry Alford*¹; ¹Arizona State University; ²Freescall Semiconductor Inc.

4:45 PM

Confirmation of Role of Hydrogen as a Compensating Donor to Enhance the Stability and Performance of Mixed Oxide Thin Film Transistors: *Terry Alford*¹; *Muhammad Hasin*¹; *Rajitha Vemuri*¹; ¹Arizona State University

5:00 PM

Simulation of a Distribution of Polarization Currents to Fit Experimental TSPC in Amorphous Pharmaceuticals: *Amir Hossein Rajabi Zamani*¹; *George Collins*¹; ¹New Jersey Institute of Technology

5:15 PM

Preparing of High Silicon Coating by Composite Electrodeposition in Magnetic Field: *Long Qiong*¹; *Zhong Yunbo*¹; *Fan Lijun*¹; ¹Shanghai University

Algorithm Development in Computational Materials Science and Engineering — Algorithms for General Materials Modeling and Integrating Experiments: Part II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee

Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas; Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, Army Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology

Wednesday PM
February 19, 2014

Room: 31B
Location: San Diego Convention Center

Session Chair: Jonathan Zimmerman, Sandia National Laboratories

2:00 PM

Reliability Calculations for Ductile Laser Welds with Stochastic Reduced-order Models: *John Emery*¹; *Richard Field*¹; *Mircea Grigoriu*²; *James Foulk*¹; ¹Sandia National Laboratories; ²Cornell University

2:20 PM

Simulation of Grain Growth in Hot-rolled 7xxx Aluminum Alloys: *Khaled Adam*¹; *David Field*¹; ¹WSU

2:40 PM

Tarjan's Algorithm for Scheduling the Solution Sequence of Systems of Federated Models: *Perry Antonelli*¹; *Gabe McNunn*¹; *Kenneth Bryden*¹; *Richard LeSar*¹; ¹Ames Laboratory

3:00 PM

Study of the Heterogeneous Deformation Process of Polycrystalline Ti-5Al-2.5Sn Alloy with Crystal Plasticity Finite Element Analysis Using Realistic 3D Microstructure: *Chen Zhang*¹; *Hongmei Li*¹; *Philip Eisenlohr*¹; *Thomas Bieler*¹; *Martin Crimp*¹; *Carl Boehlert*¹; ¹Michigan State University

3:20 PM

Numerical Modeling of Damage in Al-SiC Composites by Extended Finite Element Method (XFEM): *Salar Safarkhani*¹; *Rui Yuan*¹; *Sudhanshu Singh*¹; *Jay Oswald*¹; *Nikhilesh Chawla*¹; ¹Arizona State University

3:40 PM **Break**

4:00 PM

Integrating Advanced Materials Simulation Techniques into an Automated Data Analysis Workflow at the Spallation Neutron Source: *Jose Borreguero*¹; *Vickie E. Lynch*¹; *Shelly Ren*¹; *Mathieu Doucet*¹; *Andrei Savici*¹; *Jiawang Hong*¹; *Monojoy Goswami*¹; *Olivier Delaire*¹; *Bobby G. Sumpter*¹; *Mark Hagen*¹; *Thomas Proffen*¹; ¹Oak Ridge National Laboratory



4:20 PM

Modified Constitutive Equations for Crystal Plasticity Finite Element Modeling of Low Cycle Fatigue in Single Crystal fcc Metals: *Nicolò Grilli*¹; Koenraad Janssens²; Helena Van Swygenhoven³; ¹Laboratory for Nuclear Materials, Nuclear Energy and Safety Research Department, Paul Scherrer Institut, CH-5232 Villigen PSI & NXMM Laboratory, IMX, École Polytechnique Fédérale de Lausanne, CH-1015 Lausanne, Switzerland; ²Laboratory for Nuclear Materials, Nuclear Energy and Safety Research Department, Paul Scherrer Institut, CH-5232 Villigen PSI; ³Material Science and Simulations, NUM/ASQ, Paul Scherrer Institut, CH-5232 Villigen PSI, Switzerland & NXMM Laboratory, IMX, École Polytechnique Fédérale de Lausanne, CH-1015 Lausanne, Switzerland

4:40 PM

A New Framework to Re-construct 3D Microstructures from the Generalized 2-Point Correlation Function: *Yauheni Staraselski*¹; Abhijit Brahma¹; Kaan Inal¹; Raja Mishra²; ¹University of Waterloo; ²General Motors Research and Development Center

5:00 PM

Systematic Optimization of Pig Iron Production during Sustainable Red Mud Smelting: *Dimitrios Gerogiorgis*¹; ¹University of Edinburgh

Alloys and Compounds for Thermoelectric and Solar Cell Applications II — Alloys and Compounds for Thermoelectric and Solar Cell Applications: Thermoelectric II

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Yoshisato Kimura, Tokyo Institute of Technology; Chih-Huang Lai, National Tsing Hua University; Ce-Wen Nan, Tsinghua University; G. Jeffrey Snyder, California Institute of Technology; Hubert Scherrer, Ecole des Mines; Hsin-jay Wu, National Tsing Hua University

Wednesday PM
February 19, 2014

Room: Cardiff
Location: San Diego Marriott Marquis & Marina

Session Chairs: Teruyuki IKEDA, Ibaraki University; Hsin-jay Wu, National Tsing Hua University

2:00 PM Invited

Thermoelectric Properties of a Nanocomposite Composed of Au/AuTe₂ Nanoparticles and Sb_{1.6}Bi_{0.4}Te₃ Synthesized by a γ -Ray Irradiation Method: *Ken Kurosaki*¹; Doyoung Jung¹; Satoshi Seino¹; Manabu Ishimaru²; Kazuhisa Sato³; Yuji Ohishi¹; Hiroaki Muta¹; Shinsuke Yamanaka¹; ¹Osaka University; ²Kyushu Institute of Technology; ³Tohoku University

2:25 PM Invited

Structural Features and High Thermoelectric Performance on Mg₂(Si,Sn)-based Thermoelectric Materials: *Theodora Kyratsi*¹; ¹University of Cyprus

2:50 PM

Processing and Characterization of Thermoelectric Thin Film Devices Consisting of n-Type Bi₂Te₃ and p-Type Sb₂Te₃ Thin Film Legs: *Jae-Whan Kim*¹; Min-Young Kim¹; Jung-Yeol Choi¹; Tae-Sung Oh¹; ¹Hongik University

3:10 PM

Thermally Stable Nanocrystalline Bismuth Telluride: *Samuel Humphrey-Baker*¹; Christopher Schuh¹; ¹Massachusetts Institute of Technology

3:30 PM

Microstructure and Thermoelectric Properties of Bi₂Te₃ Materials by Powder Metallurgy Process: *Hyo-Seob Kim*¹; Soon-Jik Hong¹; ¹Kongji National University

3:50 PM Break

4:00 PM Invited

Hierarchically Architected High Performance Bulk Thermoelectrics: *David Seidman*¹; Mercouri Kanatzidis Kanatzidis¹; Kanishka Biswas¹; Jiaqing He¹; Ivan Blum¹; Chun-I Wu²; Timothy Hogan²; Vinayak Dravid¹; ¹Northwestern University; ²Michigan State University

4:25 PM Invited

Narrow Bandgap Intermetallic Compound RuGa₂: Chemical Bonding Nature, Thermoelectric Properties, and their Calculations: *Yoshiki Takagiwa*¹; Naoki Sato¹; Koichi Kitahara¹; Ken-ichi Kato²; Masaki Takata²; Kaoru Kimura¹; ¹The University of Tokyo; ²RIKEN SPring-8 Center/JASRI

4:50 PM

High-temperature Thermoelectric Properties of Ag₂Se_{0.5}Te_{0.5}: *Fivos Drymiotis*¹; Tristan Day¹; David Brown¹; Nicholas Heinz¹; G Jeffrey Snyder¹; ¹California Institute of Technology

5:10 PM

Influence of Milling Time on Microstructure and Thermoelectric Properties of p-Type Bi₂Te₃ Alloys: Madavali Babu¹; Hyo Seob Kim¹; *Soon-Jik Hong*¹; ¹Kongju National University

Alumina and Bauxite — Waste Recovery

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Ian Duncan, Hatch Ltd

Wednesday PM
February 19, 2014

Room: 15B
Location: San Diego Convention Center

Session Chair: Andrey Panov, Rusal

2:00 PM Introductory Comments

2:05 PM

The Enxal Bauxite Residue Treatment Process: Industrial Scale Pilot Plant Results: *Efthymios Balomenos*¹; Dimitris Kastritis²; Dimitrios Panias¹; Ioannis Paspaliaris¹; Dimitrios Boufounos²; ¹National Technical University of Athens; ²Alouminion S.A.

2:30 PM

Sustainability and Bauxite Deposits: *Peter-Hans ter Weer*¹; ¹TWS Services and Advice

2:55 PM

Valorization of Alumina Red Mud for Production of Geopolymeric Bricks and Tiles: *Dimitrios Panias*¹; Ioanna Giannopoulou¹; Dimitrios Boufounos²; ¹National Technical University of Athens; ²Alouminion S.A.

3:20 PM Break

3:35 PM

Study of Alternative Technologies for Residue Disposal (Red Mud): Kellen Nery¹; Joaquim Ávila¹; Milton Scarmínio¹; Luciana Bittar¹; *Rodrigo Moreno*²; Roberto Seno²; ¹Pimenta de Ávila Consultoria; ²Companhia Brasileira de Alumínio

4:00 PM

Economic Analysis of Producing Alumina with Low-grade Bauxite(Red Mud) by Calcification-carbonization Method: Zhao Qiuyue¹; Zhang Zimu¹; Zhu Xiaofeng¹; Liu Yan¹; Lv Guozhi¹; *Zhang Ting'an*¹; Wang Shuchan¹; ¹Northeastern University

4:20 PM

Recovery of Titanium Oxide from Undigested Sand of an Indian Alumina Refinery and Preparation of Value Added Titanium Carbide: *Birendra Mohapatra*¹; Saroj Singh¹; Chittaranjan Mishra¹; Barada Kanta Mishra¹; ¹Institute of Minerals & Materials Technology(IMMT)

Aluminum Alloys: Development, Characterization and Applications — Material Characterization and Modeling

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Xiyu Wen, University of Kentucky

Wednesday PM
February 19, 2014
Room: 12
Location: San Diego Convention Center

Session Chair: William Golumbfskie, Naval Surface Warfare Center, Carderock Division

2:00 PM

Correlation between Different Metallurgical Parameters and Hardness of Aluminum-Silicon Alloys Using Minitab Software: *Mahmoud Tash¹*; Saleh AlKhatani¹; ¹Salman bin Abdulaziz University

2:20 PM

Update of the Al-Fe-Mn-Si Thermodynamic Description within the TCAL Database and Predictions for the Phase Formation in a Wide Range of Commercial Aluminum Alloys: Hailin Chen¹; *Qing Chen¹*; Johan Bratberg¹; Paul Mason¹; Anders Engström¹; ¹Thermo-Calc Software AB

2:40 PM

An Observation of β -phase Precipitation Cycling in Al-Mg Alloys during In Situ TEM Heating Experiments: *Daniel Scotto D'Antuono¹*; Daniel Foley²; Jennifer Gaies³; William Golumbfskie³; Mitra Taheri¹; ¹Drexel University; ²University of Maryland; ³Naval Surface Warfare Center

3:00 PM

Effect of Heat Treatment on Microstructure and Mechanical Properties of Al₂Ca Added A383 Alloy: *Young-Ok Yoon¹*; Gil-Yong Yeom¹; Hyun Kyu Lim¹; Shae K. Kim¹; ¹Korea Institute of Industrial Technology

3:20 PM

Stress-strain Curves of Pure Aluminum and Al-4.5mass%Cu Alloy in Semi-solid State: *Nobuhito Sakaguchi¹*; ¹Sumitomo Light Metal Industries,LTD.

3:40 PM Break

3:55 PM

Thermo-mechanical Behavior of a 5xxx Series Aluminum Alloy; Experiment and Constitutive Modeling: *Farhoud Kabirian¹*; Akhtar Khan¹; ¹University of Maryland, Baltimore County

4:15 PM

Modeling Texture Evolution of Pure FCC Alloy during Annealing: Shiyao Huang¹; Ruijie Zhang²; *Mei Li¹*; ¹Ford Motor Company; ²University of Science and Technology Beijing

4:35 PM

Microstructure and Mechanical Properties of 3003 Aluminum Alloy with Mg and Ni Addition: Zhijiao Tang¹; *Ye Pan¹*; Tao Lu¹; Yabiao Lin²; ¹Southeast University; ²Yinbang Aluminum Industry Co. Ltd.

4:55 PM

Lightweight Construction for Electric Mobility Using Aluminium: *Andreas Kleine¹*; Marcel Rosefort¹; Hubert Koch¹; ¹TRIMET Aluminium SE

5:15 PM

3D Microstructural Characterization and Mechanical Properties of Constituents Particles in Al7075 Alloys Using X-ray Synchrotron Tomography and Nanoindentation: *Sudhanshu Shekhar Singh¹*; Cary Schwartzstein¹; Jason Williams¹; Xianghui Xiao²; Francesco De Carlo²; Nikhilesh Chawla¹; ¹Arizona State University; ²Argonne National Laboratory

Aluminum Reduction Technology — Fundamentals - Electrochemistry and New Processes

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Margaret Hyland, University of Auckland

Wednesday PM
February 19, 2014
Room: 13
Location: San Diego Convention Center

Session Chair: Geoff Brooks, Swinburne University of Technology

2:00 PM Introductory Comments

2:05 PM

Mass Transfer Reactions Near the Cathode during Aluminium Electrolysis: *Geir Martin Haarberg¹*; Peng Cui¹; ¹Norwegian University of Science and Technology

2:30 PM

Current Efficiency in Aluminium Reduction Cells:Theories, Models, Concepts, and Speculation: *Asbjorn Solheim¹*; ¹SINTEF

2:55 PM

Effect of Current Density and Phosphorus Species on Current Efficiency in Aluminum Electrolysis at High Current Densities: *Rauan Meirbekova¹*; Jomar Thonstad²; Geir Haarberg²; Gudrun Saevarsdottir¹; ¹Reykjavik University; ²NTNU

3:20 PM

A Concept for Electrowinning of Aluminium Using Depolarized Gas Anodes: *Tommy Mokkelbost¹*; Ole Kjos¹; Ove Paulsen¹; Bjarte Øye¹; Henrik Gudbrandsen¹; Arne Petter Ratvik¹; Geir Haarberg²; Egil Skybakmoen¹; ¹SINTEF Materials and Chemistry; ²Norwegian University of Science and Technology

3:45 PM Break

4:00 PM

Investigations into Innovative and Sustainable Processes for the Carbothermic Production of Gaseous Aluminum: *Efthymios Balomenos¹*; Panagiotis Diamantopoulos¹; Dimitrios Gerogiorgis¹; Dimitrios Pantias¹; Ioannis Paspaliaris¹; Christoph Kemper²; Lars Peters²; Bernd Friedrich²; Irina Vishnevetsky³; Michael Epstein³; Martin Halmann³; Andreas Haselbacher⁴; Zoran Jovanovic⁴; Aldo Steinfeld⁴; ¹National Technical University of Athens; ²IME Process Metallurgy and Metal Recycling,RWTH Aachen University; ³Weizmann Institute of Science; ⁴ETH Zurich

4:25 PM

A CFD-PBM Coupled Model Predicting Anodic Bubble Size Distribution in Aluminum Reduction Cells: Shuiqing Zhan¹; *Mao Li²*; Jiemin Zhou³; Jianhong Yang⁴; Yiwen Zhou⁴; Chenn Q Zhou⁵; ¹Central South University; ²Central South University;Purdue University Calumet; ³Central South University; ⁴Zhengzhou Research Institute,Chalco Ltd; ⁵ Purdue University Calumet

4:50 PM

Simulation of Anode Bubble: Volume of Fluid Method: *Yiwen Zhou¹*; Jiemin Zhou¹; Jianhong Yang²; Wangxing Li²; Shouhui Chen²; ¹School of Energy Science and Engineering, Central South University; ²Zhengzhou Reseach Institute of Chalco

5:15 PM

EAF Carbothermic Co-reduction of Alumina and Silica, for the Direct Production of Al-Si Master Alloy: *Christoph Kemper¹*; Efthymios Balomenos²; Dimitrios Pantias²; Ioannis Paspaliaris²; Bernd Friedrich¹; ¹IME Process Metallurgy and Metal Recycling, RWTH Aachen University; ²National Technical University of Athens



Aluminum Reduction Technology — Potline Operations- Equipment

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Margaret Hyland, University of Auckland

Wednesday PM Room: 14A
February 19, 2014 Location: San Diego Convention Center

Session Chair: B.K. Kakkar

2:00 PM Introductory Comments

2:05 PM

A Novel Heat Recovery Technology from an Aluminum reduction Cell Side Walls: Experimental and Theoretical Investigations: *Yaser Mollaei Barzi*¹; Mohsen Assadi¹; Håvard Møllerhagen Arvesen²; ¹University of Stavanger; ²Goodtech Recovery Technology AS

2:30 PM

Non-linear Behavior of a Metallic Foam for the Reduction of Energy Losses at Electrical Contacts in the Aluminum Industry: *René von Kaenel*¹; Jacques Antille¹; Michel Pillet²; Matthieu Lindeboom²; ¹KAN-NAK Ltd.; ²AMC ETEC Ltd.

2:55 PM

Influence of Heat Source Cooling Limitation on ORC System Layout and Working Fluid Selection: The Case of Aluminum Industry: *Yves Ladam*¹; ¹SintefEenergy

3:20 PM

Concept and Design of Dubal Pot Start-up Fuses: Michel Reverdy¹; *Abdulla Zarouni*¹; Lalit Mishra¹; Marwan Bastaki¹; Amal Al Jasmi¹; Vinko Potocnik¹; ¹DUBAL

3:45 PM Break

4:00 PM

A Novel Design Criterion for Alumina Feeders in Aluminium Electrolysis Cells: *Asbjorn Solheim*¹; ¹SINTEF

4:25 PM

On-line Monitoring of Anode Currents; Experience at Trimet: Andreas Luetzerath¹; *James Evans*²; Ron Victor²; ¹TRIMET Aluminium SE; ²Wireless Industrial Technologies (WIT)

4:50 PM

Start and Tuning of Material Distribution System at Aluminum Smelter in Qatar: Julian Sowah¹; *Jan Paepcke*²; Arne Hilck²; Vivek Shroff¹; Santosh Kumar¹; Rahul Jain¹; ¹Qatalum; ²Claudius Peters Projects

Biological Materials Science Symposium — Multi-functional Surfaces and Interfaces (Joint session with Characterization of Minerals, Metals and Materials 2014 Symposium)

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Po-Yu Chen, National Tsing Hua University; Rajendra Kasinath, Johnson and Johnson Company; Dwayne Arola, University of Washington; Kalpana Katti, North Dakota State University

Wednesday PM Room: 33A
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Bowen Li, Michigan Technological University; Nima Rahbar, Worcester Polytechnic Institute

2:00 PM Invited

Bacteria on Surfaces: Engineering Surface Microstructures to Control Bacterial Adhesion and Biofilm Growth: *Benjamin Hatton*¹; ¹University of Toronto

2:30 PM

Antibacterial Effect of Plastics Containing Copper-based Mineral Additive: *Bowen Li*¹; ¹Michigan Technological University

2:50 PM

On the Determining Role of Network Structure Titania in Silicone against Bacterial Colonization: Mechanism and Disruption of Biofilm: *Dilip Depan*¹; R.D.K. Misra¹; ¹University of Louisiana at Lafayette

3:10 PM

Interplay between Protein Adsorption at Biointerfaces and Osteoblast Functions: *Krishna Chaitanya Nune*¹; Devesh Misra¹; Pentti Karjalainen²; Mahesh Somani²; ¹University of Louisiana at Lafayette; ²University of Oulu

3:30 PM Break

3:50 PM Invited

Improving the Resistance to Contact and Flexural Damage of Ceramics Using Elastic Gradients: *Yu Zhang*¹; ¹NYU College of Dentistry

4:20 PM

Interfacial Adhesion between Polymer and Osteoconductive Minerals: *Sina Youssefian*¹; Pingsheng Liu²; Nima Rahbar¹; Jie Song²; ¹Worcester Polytechnic Institute; ²University of Massachusetts Medical School

4:40 PM

Structural Design and Attachment Mechanisms of Aquatic Insects: *Guan-Lin Liu*¹; Yin Chang¹; Yung-Chieh Chuang¹; Hao-Jen Fang¹; Po-Yu Chen¹; ¹Department of Materials Science and Engineering, National Tsing Hua University

5:00 PM

Characteristics and Influence of TiO₂ Layer on the Corrosion Resistance of Ultrafine Grained, Commercially Pure, and Surface Treated Titanium for Biomedical Applications: *Daniel Fernandes*¹; Carlos Elias²; Felipe Lopes²; Sergio Monteiro²; Ruslan Valiev³; Marc Meyers¹; ¹University of California, San Diego; ²Military Institute of Engineering; ³Ufa State Aviation Technical University

Bulk Metallic Glasses XI — Simulation and Modeling

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Wednesday PM Room: 2
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Dan Miracle, AF Research Laboratory; Karin Dahmen, University of Illinois at Urbana Champaign

2:00 PM Invited

Modeling Plastic Deformation and the Statistics of Serrations in the Stress Versus Strain Curves of Bulk Metallic Glasses: *Karin Dahmen*¹; James Antonaglia¹; Xie Xie²; Junwei Qiao³; Y Zhang⁴; Jonathan Uhl; Peter Liaw²; ¹University of Illinois at Urbana Champaign; ²The University of Tennessee; ³Taiyuan University of Technology; ⁴University of Science and Technology Beijing

2:20 PM

Calculation of the Dynamic Loss Modulus for Bulk Metallic Glasses: *Peter Derler*¹; Robert Maass²; ¹Paul Scherrer Institut; ²University of Göttingen

2:30 PM Invited

A Predictive Model for Binary Metallic Glasses: *Dan Miracle*¹; Kevin Laws²; Oleg Senkov³; Michael Ferry²; ¹AF Research Laboratory; ²Australian Research Council Centre of Excellence for Design in Light Metals, School of Materials Science and Engineering; ³UES, Inc

2:50 PM

Search for Universal Characteristics of Metallic Glass Formation by Rapid Molecular Dynamics Simulation: *David Riegner*¹; Logan Ward²; Kathy Flores³; Wolfgang Windl¹; ¹The Ohio State University; ²Northwestern University; ³Washington University in St. Louis

3:00 PM Invited

Fracture and Cavitation Behaviors in Brittle and Ductile Metallic Glasses: *Huajian Gao*¹; ¹Brown University

3:20 PM Invited

A Predictive Model for Ternary Bulk Metallic Glasses and its Application: *Kevin Laws*¹; *Daniel Miracle*²; *Oleg Senkov*²; *Michael Ferry*¹; ¹University of New South Wales; ²Air Force Research Laboratories

3:40 PM Break

3:50 PM Invited

Theoretical Strength of Metallic Glasses: *Mo Li*¹; ¹Georgia Institute of Tech

4:10 PM Invited

Glass Transition by Gelation: *Michael Demkowicz*¹; *Richard Baumer*¹; ¹Massachusetts Institute of Technology

4:30 PM

Characterization of Inhomogeneous Deformation and Serrated Flows in Bulk Metallic Glasses: *Xie Xie*¹; *James Antonaglia*²; *Junwei Qiao*³; *Gongyao Wang*¹; *Yong Zhang*⁴; *Yoshihiko Yokoyama*⁵; *Karin Dahmen*²; *Peter Liaw*¹; ¹University of Tennessee; ²University of Illinois at Urbana Champaign; ³Taiyuan University of Technology; ⁴University of Science and Technology Beijing; ⁵Tohoku University

4:40 PM Invited

Modeling of Metallic Glass by Energy Minimization: *Martin Ostoja-Starzewski*¹; *Dansong Zhang*¹; *Jun Zhang*¹; ¹University of Illinois

5:00 PM Invited

Uniaxial and Bending Deformation of Metallic-glass and Titanium Laminate by Molecular Dynamics Simulation: *Yunche Wang*¹; *Chun-Yi Wu*¹; *Peter Liaw*²; ¹National Cheng Kung University; ²University of Tennessee

5:20 PM Invited

Atomic Simulation of Size Dependent Tensile Ductility of Metallic Glasses: *Jian Luo*¹; *Yunfeng Shi*¹; ¹RPI

5:40 PM Invited

Metallic Glass Model: Interconnecting Zones and Free Volumes: *Cang Fan*¹; *C. T. Liu*²; *P. K. Liaw*³; ¹Nanjing University of Science and Technology; ²City University of Hong Kong; ³University of Tennessee

Cast Shop for Aluminum Production — Furnaces and Energy

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Edward Williams, Alcoa

Wednesday PM
February 19, 2014

Room: 15A
Location: San Diego Convention Center

Session Chairs: Cynthia Belt, Energy Management Consultant; Mark Jolly, Cranfield University

2:00 PM Introductory Comments

2:05 PM

Regenerative Burners Assessment in Holding Reverberatory Furnace: *Mohamed Hassan*¹; *Panagiotis Forakis*¹; *Hassan Al Moosawi*¹; *Mohamed Ibrahim*¹; ¹Masdar Institute of Science and Technology

2:30 PM

Computational Analysis of Thermal Process of a Regenerative Aluminum Melting Furnace: *Jimin Wang*¹; *Yuanyuan Zhou*¹; *Hongjie Yan*²; *Jiemin Zhou*²; ¹Anhui University of Technology; ²Central South University

2:55 PM

Electromagnetic Stirring in Melting Furnaces - A Critical Evaluation: *Andreas Buchholz*¹; *Georg Rombach*¹; *Gerd-Ulrich Grün*¹; ¹Hydro Aluminium Rolled Products GmbH

3:20 PM

Sampling Tool for In-depth Study of Furnace Processes: *Stephen Instone*¹; *Mark Badowski*¹; *Daniel Krings*¹; ¹Hydro Aluminium Rolled Products GmbH

3:45 PM Break

4:00 PM

Transient Properties of Refractory Castable with Hydraulic Binders: *Mohamed-Ali Maaroufi*¹; *Cécile Diliberto*¹; *André Leconte*¹; *Olivier Francy*²; *Pierre Le Brun*³; ¹Institut Jean Lamour; ²Saint-Gobain CREE; ³Constellium

4:25 PM

A Novel Method of Online Measurement to Develop Specific Heating-up Procedures for Refractories in Industrial Furnaces: *Thomas Schemmel*¹; *Guenter Thieser*¹; *Uwe Kremer*²; *Norbert Pfitzner*³; ¹Refratechnik Steel GmbH; ²TRIMET Aluminium SE; ³Franken Industrieofen-Service GmbH

Celebrating the Megascale: An EPD Symposium in Honor of David G.C. Robertson — Metallurgical Education

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, W A School of Mines; Geoffrey Brooks, Swinburne University of Technology

Wednesday PM
February 19, 2014

Room: 16A
Location: San Diego Convention Center

Session Chairs: Peter Hayes, University of Queensland; Merete Tangstad, Norwegian University of Science & Technology (NTNU)

2:00 PM Introductory Comments

2:05 PM Invited

Current and Suggested Focus on Sustainability in Pyrometallurgy: *John See*¹; *D.G.C. Robertson*²; *Phillip Mackey*³; ¹Consultant; ²Missouri University of Science and Technology; ³P.J.Mackey Technology Inc

2:25 PM Invited

Teaching Process Simulation in Eleven Easy Lessons Using Excel: *Art Morris*¹; ¹Thermart Software

2:45 PM Invited

Enhancement of Pyrometallurgical Teaching Using Excel Simulation Models: *Eric Grimsey*¹; ¹Curtin University, W A School of Mines

3:05 PM Invited

The Engineering Design Sequence and Materials Development: 990 Gold-Titanium as a Case Study: *Mark Schlesinger*¹; ¹Missouri University of Science and Technology

3:25 PM Break

3:45 PM Invited

The Challenges for Professional Metallurgical Education: *Bob Hannah*¹; *Peter Hayes*¹; ¹University of Queensland

4:05 PM Invited

Sustainability Education for Minerals and Materials Industry Professionals: *William Rankin*¹; ¹CSIRO

4:25 PM Invited

Delivering a National Process Design Unit with Industry Support: *Don Ibana*¹; ¹Curtin University

4:45 PM Invited

The MetSkill Program – Rapidly Developing Effective Young Engineers in the Workplace: *Diana Drinkwater*¹; ¹JKTech



Characterization of Minerals, Metals and Materials 2014 — Characterization of Material Processing

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

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhamyies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Wednesday PM
February 19, 2014

Room: 7A
Location: San Diego Convention Center

Session Chairs: Tonya Stone, Mississippi State; Pasquale Russo Spena, Free University of Bozen-Bolzano

2:00 PM

The Structure-property Relationship of Cold-drawn 1010 Steel Tubing: *Tonya Stone*¹; Ken Sullivan¹; Mark Horstemeyer¹; Robert Zelinka²; ¹Mississippi State University; ²Plymouth Tube

2:20 PM

Characterization of Particle Damage and Surface Exposure of a Copper Ore Processed by Jaw Crusher, HPGR and Electro-dynamic Fragmentation: *Otávio Gomes*¹; Debora de Oliveira¹; Luis Sobral¹; Eric Pirard²; ¹CETEM; ²University of Liege

2:40 PM

Effect of Friction Stir Welding Speed and Post Weld Heat Treatment on the Microstructure and Hardness of AA7020: *Mohamed Ahmed*¹; Essam Ahmed¹; Abdalla Mahdy¹; ¹Suez University

3:00 PM

Study on Reactivity between Mould Fluxes and High-Al Molten Steel: *Ting Wu*¹; Shengping He¹; Qian Wang¹; ¹Chongqing University

3:20 PM

Grinding Kinetics of Vanadium-titanium Magnetite Concentrate in a Ball Mill: *Zhang Rende*¹; lv xuewei¹; ji changyang¹; zheng xiangwei¹; ¹College of Materials Science and Engineering, Chongqing University, China

3:40 PM Break

3:50 PM

Arc Welding of Advanced High Strength Steels for Car-body Components: *Pasquale Russo Spena*¹; Fabio D'Aiuto²; Paolo Matteis³; Giorgio Scavino³; ¹Free University of Bozen-Bolzano; ²Centro Ricerche Fiat S.C.p.A.; ³Politecnico di Torino

4:10 PM

Load Carrying Capacity and Microstructure of Resistance Spot Welded Dual-phase (DP600) Steel: *Sabbah Ataya*¹; ¹Suez University

4:30 PM

Influence of Different Cooling Structure on Surface Crack of HSLA Steel Plate by DHCR: *Banglun Wang*¹; ¹Chongqing University

4:50 PM

Optimization on Refining Slag and Tapping Deoxidation System for Carbon Structure Steel without Calcium Treatment: *Shuo Zhao*¹; Wang Qian¹; Chen Gujun¹; He Shengping¹; Peng Mingming¹; ¹Chongqing University

Computational Discovery of Novel Materials — Methodologies and Application for Materials Discovery

Sponsored by: TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS/ASM: Computational Materials Science and Engineering Committee

Program Organizers: Francesca Tavazza, National Institute of Standards and Technology; Richard Hennig, Cornell University; Dallas Trinkle, University of Illinois, Urbana-Champaign

Wednesday PM
February 19, 2014

Room: 31A
Location: San Diego Convention Center

Session Chair: Richard Hennig, Cornell University

2:00 PM Invited

Structure Prediction from First Principles: *Eva Zurek*¹; ¹University at Buffalo, SUNY

2:30 PM

Solid-liquid Coexistence in Small Systems: A Statistical Method to Calculate Melting Temperatures: *Qijun Hong*¹; Axel van de Walle²; ¹Caltech; ²Brown University

2:50 PM

Bayesian Model Selection in Cluster Expansions: *Jesper Kristensen*¹; Nicholas Zabaras¹; ¹Cornell University

3:10 PM Invited

Assessing the Reliability of the “Base” of Multiscale Modeling: First-Principles Description of Van Der Waals Interactions in Materials: *Alexandre Tkatchenko*¹; Fritz-Haber-Institut der Max-Planck-Gesellschaft

3:40 PM Break

3:55 PM

Validation of Density Functional Theory for Bulk Solids: *Richard Taylor*¹; Francesca Tavazza¹; Eric Cockayne¹; Tom Allison¹; Mark Stiles¹; ¹NIST

4:15 PM

Computational Design of Nanosegregated Pt Alloy Catalysts: *Guofeng Wang*¹; Zhiyao Duan¹; Shyam Kattel¹; ¹University of Pittsburgh

4:35 PM

Novel Approach to Find Chemical Composition of Heat-resistant Nickel Superalloy, Designed for Naval Power Plants: *Yuriy Shmotin*¹; Alexander Logunov¹; Denis Danilov¹; *Igor Leshchenko*¹; JSC “NPO “SATURN”

Computational Thermodynamics and Kinetics — Phase-field Simulations/Molecular Dynamics

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

Wednesday PM
February 19, 2014

Room: 30D
Location: San Diego Convention Center

Session Chairs: Yu Wang, Michigan Technological University; Katsuyo Thornton, University of Michigan

2:00 PM Invited

Modeling the Solidification, Growth and Properties of Multiferroic Polycrystalline Materials: *Ken Elder*¹; ¹Oakland University

2:25 PM

Molecular Dynamics Simulation of Solidification in Cu50Zr50 Alloy: *Seth Wilson*¹; *Mikhail Mendelev*¹; ¹Ames Laboratory

2:45 PM

Molecular Dynamics Simulations of Wetting in Nanowire Geometries: *Timofey Frolov*¹; W. Craig Carter²; Mark Asta¹; ¹University of California Berkeley; ²Massachusetts Institute of Technology

3:05 PM

Three-dimensional Phase Field Model for Vapor-liquid-solid Growth of Nanowires: *Yanning Wang*¹; Seunghwa Ryu²; Paul McIntyre¹; Wei Cai¹; ¹Stanford University; ²Korea Advanced Institute of Science and Technology

3:25 PM

Phase Field Models and Plastic Flow: *Alphonse Finel*¹; Pierre-Antoine Geslin¹; Pierre-Louis Valdenaire¹; Benoît Appolaire¹; Yann Le Bouar¹; ¹ONERA-CNRS

3:45 PM Break

4:05 PM Invited

Framework for Parameterizing the Phase-field Crystal Model: V.W.L. Chan¹; Susanta Ghosh¹; Nirand Pisutha-Arnon²; *Katsuyo Thornton*¹; ¹University of Michigan; ²King Mongkut's Institute of Technology Ladkrabang

4:30 PM

Configurational Entropy and Structure of the Molten NaCl-KCl-ZnCl₂ Salt Mixtures: *Venkateswara Rao Manga*¹; Stefan Bringuier¹; Saivenkataraman Jayaraman²; Pierre Lucas¹; Pierre Deymier¹; Krishna Muralidharan¹; ¹University of Arizona; ²MIT

4:50 PM

Multiscale Modeling of Precipitate Morphology and Evolution in Mg-Nd Alloys: *Yanzhou Ji*¹; Ahmed Issa²; Tae Wook Heo¹; James Saal²; Chris Wolverton²; Long-Qing Chen¹; ¹The Pennsylvania State University, University Park; ²Northwestern University

5:10 PM

Atomistically-informed Phase Field Simulations of Germanium Crystallization in Laser Driven Systems: Celia Reina¹; Luis Sandoval²; *Jaime Marian*³; ¹University of Pennsylvania; ²LANL; ³LLNL

Data Analytics for Materials Science and Manufacturing — Inverse Methods II: Reduced Order Modeling

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Jeff Simmons, Air Force Research Laboratory; Charles Bouman, Purdue University; Fariba Fahroo, Air Force Office of Scientific Research; Surya Kalidindi, Georgia Institute of Technology; Jeremy Knopp, Air Force Research Laboratory; Peter Voorhees, Northwestern University

Wednesday PM

Room: 30E

February 19, 2014

Location: San Diego Convention Center

Session Chairs: Surya Kalidindi, Georgia Institute of Technology; Jeff Simmons, Air Force Research Laboratory

2:00 PM

Physics of Regularized Image Processing: *Jeff Simmons*¹; Craig Przybyla¹; Stephen Bricker¹; Charles Bouman²; Michael Jackson³; Marc De Graeff¹; ¹Air Force Research Laboratory; ²Purdue University; ³Blue Quartz Software; ⁴Carnegie Mellon University

2:20 PM Invited

A New Probabilistic Graph Model and Its Application to Materials Microstructures: *Mary Comer*¹; Huixi Zhao¹; ¹Purdue University

2:45 PM

Stochastic-integral Models for Propagation-of-uncertainty Problems in Nondestructive Evaluation: *Elias Sabbagh*¹; R. Murphy¹; Harold Sabbagh; John Aldrin²; Jeremy Knopp; Mark Blodgett; ¹Victor Technologies, LLC; ²Computational Tools

3:05 PM

A Response Surface Method (RSM) for Model-based Optimization of Expanded Perlite Production: *Dimitrios Gerogiorgis*¹; Panagiotis Angelopoulos²; Ioannis Paspaliaris²; ¹University of Edinburgh; ²National

Technical University of Athens (NTUA)

3:25 PM

Growth Path Envelope Analysis of Grain Growth in Tungsten: *Burton Patterson*¹; Tyler Kaub¹; Amy Adams¹; George Strickland¹; Steven Chiu¹; Robert DeHoff¹; Veena Tikare²; Zak Fang³; ¹University of Florida; ²Sandia National Laboratories, New Mexico; ³University of Utah

3:45 PM Break

4:00 PM Invited

Predictive Modeling in Characterizing Localization Relationships: *Ruoqian Liu*¹; Zhengzhang Chen¹; Tony Fast²; Surya Kalidindi²; Ankit Agrawal¹; Alok Choudhary¹; ¹Northwestern University; ²Georgia Institute of Technology

4:25 PM

New Data Mining Techniques in Materials Science : Bayesian Networks to Predict the Yield Stress of Ni-Base Superalloys: Edern Menou¹; *Franck Tancret*¹; Philippe Leray¹; ¹Université de Nantes

4:45 PM

Applications of Wavelets in the Representation and Prediction of Transformation in Shape-memory Polycrystals: *Gal Shmuel*¹; Adam Thorgeirsson²; Kaushik Bhattacharya¹; ¹CalTech; ²University of Iceland

5:05 PM

Leveraging Data Science to Enable Multiscale Materials Modeling and Design: *Surya Kalidindi*¹; ¹Georgia Institute of Technology

Deformation, Damage, and Fracture of Light Metals and Alloys III — Ti Alloys

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

Program Organizers: Ke An, Oak Ridge National Laboratory; Qizhen Li, University of Nevada, Reno

Wednesday PM

Room: 19

February 19, 2014

Location: San Diego Convention Center

Session Chair: Hongbin Bei, Oak Ridge National Laboratory

2:00 PM Invited

Effect of Extrusion Speed on the Microstructures and Mechanical Properties of Ti-6Al-4V Alloy Prepared by Combining of Powder Compact Hot Pressing and Extrusion under Air: *Fei Yang*¹; Brian Gabbitas¹; Huiyang Lu¹; Ajit Singh¹; ¹The University of Waikato

2:20 PM

Characterization of Ti/Al Multilayered Composites Subjected to Perforation Testing: *Derrick Stokes*¹; Jennifer Conway¹; Stanley Jones¹; Viola Acoff¹; ¹The University of Alabama

2:40 PM

Mechanical Properties of Ti-6Al-4V Rods Produced by Powder Compact Extrusion: *Ajit Singh*¹; Brian Gabbitas¹; Rob Torrens¹; Fei Yang¹; Aamir Mukhtar²; ¹Waikato Centre for Advance Materials, School of Engineering, University of Waikato, Hamilton, New Zealand; ²Titanium Industry Development Association Inc. (TiDA), Tauranga, New Zealand

3:00 PM

Development of Low-cost Powder Metallurgy Titanium Alloys by Addition of Commercial 430 Stainless Steel Powder: *Leandro Bolzoni*¹; Enrique Herraiz²; Elisa Maria Ruiz-Navas²; Elena Gordo²; ¹Brunel University; ²Universidad Carlos III de Madrid



Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — High-Strain-Rate Deformation Mechanisms

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

Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Wednesday PM Room: 3
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Herve Couque, Nexter Munitions; Alain Molinari, University of Lorraine

2:00 PM Keynote

Dislocation Mechanics of High Rate Deformations: *Ronald Armstrong*¹; ¹University of Maryland

2:30 PM Invited

A Physically Based Constitutive Model for the Viscoplastic Behavior of fcc Pure Metals and Alloys under Shock Wave Loading: Ryan Austin¹; *David McDowell*²; ¹Lawrence Livermore National Laboratory; ²Georgia Institute of Technology

2:50 PM Invited

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

3:10 PM Invited

Signatures of Deformation Twinning – The Mechanical Threshold Stress Constitutive Model: *Paul Follansbee*¹; ¹Saint Vincent College

3:30 PM

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

3:50 PM Break

4:10 PM

Signatures of Dynamic Strain Aging – The Mechanical Threshold Stress Constitutive Model: *Paul Follansbee*¹; ¹Saint Vincent College

4:30 PM Invited

Multiscale Collective Behavior of Defects and Criticality of Damage-failure Transitions under Dynamic and Shock Wave Loading: *Oleg Naimark*¹; ¹ICMM UB RAS

4:50 PM Invited

Large Plastic Deformation of FCC Metals at High Strain Rates: *Hervé Couque*¹; ¹Nexter Munitions

5:10 PM

3-D Analysis of Incipient Spall Damage Geometry and its Correlation to Microstructure in Shock Loaded Copper Polycrystals: *Andrew Brown*¹; Kapil Krishnan¹; Quan Pham¹; Pedro Peralta¹; Shengnian Luo²; Brian Patterson³; Darrin Byler³; Scott Greenfield³; Kenneth McClellan³; Aaron Koskelo³; ¹Arizona State University; ²Sichuan University; ³Los Alamos National Laboratory

Electrode Technology for Aluminium Production — Cathode Materials and Wear

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Andre Proulx, Rio Tinto Alcan

Wednesday PM Room: 14B
February 19, 2014 Location: San Diego Convention Center

Session Chair: Alan Tomsett, Pacific Aluminium

2:00 PM Introductory Comments

2:05 PM

Room Temperature Creep Behaviour of Ramming Paste Baked at Different Temperatures: *Pierre-Olivier St-Arnaud*¹; Donald Picard¹; Houshang Alamdari¹; Donald Ziegler²; Mario Fafard¹; ¹Université Laval; ²Alcoa Primary Metals

2:30 PM

Characterization of the Material Behaviour of Cathode Steel Collector Bar at High Temperatures and Low Stress Levels: *Femi Fakoya*¹; Donald Picard¹; Guillaume Gauvin¹; Houshang Alamdari¹; Richard Beeler²; Mario Fafard¹; ¹REGAL, Université Laval; ²Alcoa Primary Metals, Alcoa Technical Center

2:55 PM

Cartography and Chemical Composition of the Different Deposits in the Hall-Heroult Process: François Allard¹; Marc-André Coulombe¹; *Gervais Soucy*¹; Loig Rivoaland²; ¹Université de Sherbrooke; ²Rio Tinto Alcan

3:20 PM Break

3:30 PM

Interaction of Sodium Vapor and Graphite Studied by Thermogravimetric Analysis: *Zhaohui Wang*¹; Tor Grande¹; Egil Skybakmoen²; Arne Peter Ratvik²; ¹Norwegian University of Science and Technology (NTNU); ²SINTEF

3:55 PM

N-SiC Side Lining- Variations of Materials Structure: *Andrey Yurkov*¹; Oksana Danilova¹; Alexey Dovgal¹; ¹Voljsky Abrasive Works

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Design Against Fatigue and Fatigue Property Enhancement

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

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

Wednesday PM Room: 7B
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Diana A. Lados, Worcester Polytechnic Institute; Tongguang Zhai, University of Kentucky

2:00 PM Introductory Comments

2:05 PM Keynote

Quantitative Effects of Micro-texture on Growth Behaviors of Short Fatigue Cracks in Al Alloys: *Tongguang Zhai*¹; ¹University of Kentucky

2:45 PM Invited

Design for Fatigue Crack Growth Resistance in Light Metal Alloys: Recent Developments and Steps Forward: *Diana A. Lados*¹; Anastasios Gavras; Anthony Spangenberg; ¹Worcester Polytechnic Institute

3:05 PM Invited

Enhanced Fatigue Strength of Nanocrystalline Cu and Cu-Al Alloys: *Zhefeng Zhang*¹; Xianghai An¹; Shiding Wu¹; ¹Institute of Metal Research

3:25 PM

Influence of Non Metallic Inclusions on Low Cycle Fatigue Life at Intermediate Temperature of Inconel718DA: *Damien Texier*¹; Ana Casanova

Gomez¹; Patrick Villechaise¹; Jonathan Cormier¹; Tresa Pollock²; Stéphane Pierrat³; ¹Institut Pprime - ENSMA; ²UC Santa Barbara; ³SNECMA

3:45 PM Break

4:05 PM

Fatigue Properties of Nanostructured Al6061 Plates Produced by Equal Channel Angular Extrusion: Hamid Alihosseini¹; *Mohsen Asle Zaeem*¹; ¹Missouri University of Science and Technology

4:25 PM

Effect of Laser Ablation Coating Removal (LACR) on a Steel Substrate: *Md. Shamsujjoha*¹; Sean Agnew¹; Michael Melia¹; James Fitz-Gerald¹; Terry Tyler²; James Brooks²; Matthew Stremmer³; ¹University of Virginia; ²Newport News Shipbuilding; ³Commonwealth Center for Advanced Manufacturing

4:45 PM

Investigation of Fatigue Micromechanisms in Ultrafine Grained Al-Mg-Sc Alloy: *Mageshwari Komarasamy*¹; Rajiv Mishra¹; ¹University of North Texas

5:05 PM

Methodologies for Microstructure-sensitive Fatigue Design of Ni-base Superalloys that Undergo Aging: *Michael Kirka*¹; Sean Neal¹; Richard Neu¹; ¹Georgia Institute of Technology

5:25 PM Concluding Comments

Gamma TiAl Alloys 2014 — Session VI

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Titanium Committee

Program Organizers: Young-Won Kim, Gameck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimiduk, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

Wednesday PM
February 19, 2014

Room: 6B
Location: San Diego Convention Center

Session Chairs: Rui Yang, Institute of Metal Research; Svea Mayer, Montanuniversitaet Leoben

2:00 PM Invited

Laser-based Additive Manufacturing of Titanium Aluminides: *Christoph Leyens*¹; Frank Brückner¹; Steffen Nowotny¹; ¹Fraunhofer IWS

2:25 PM

Development and Optimization of Process Parameters for TNMB1 Titanium Aluminide for Selective Laser Melting: From Single Track to Fully Dense Specimens: *Lukas Loeber*¹; Uta Kuehn¹; Juergen Eckert¹; Frank Peter Schimansky²; Florian Pyczak²; ¹IFW Dresden; ²Helmholtzzentrum Geesthacht

2:45 PM Invited

Effect of the Microstructure on the Deformation and Fatigue Damage in a Gamma-TiAl Produced by Additive Manufacturing: *Mauro Filippini*¹; Stefano Beretta¹; Luca Patriarca¹; Silvia Sabbadini²; ¹Politecnico di Milano; ²AVIO S.p.A.

3:10 PM Break

3:30 PM

Role of Interstitial Atoms on the Macroseggregation and Microseggregation in High Nb Containing TiAl Alloys: Tiebang Zhang¹; Rui Hu¹; *Zeen Wu*¹; Hongchao Kou¹; Jinshan Li¹; ¹Northwestern Polytechnical University

3:50 PM Invited

Additive Manufacturing via Electron Beam Melting of Gamma TiAl Alloys: *Sara Biamino*¹; Federica Pelissero²; Silvia Sabbadini²; Paolo Fino¹; Claudio Badini¹; ¹Politecnico di Torino; ²Avio s.p.a

4:10 PM

Additive Manufacturing of Gamma TiAl Alloys and Control and Integration of Application-specific Microstructures: Jaimie Tiley¹; Sang-Lan Kim²; *Young-Won Kim*³; ¹AFRL; ²UES, Inc.; ³Gameck, Inc.

4:30 PM

Microstructure and Properties of Gamma-TiAl (48-2-2) Produced by Selective Electron Beam Melting: *Vera Jüchter*¹; Jan Schwerdtfeger²; Carolin Körner¹; ¹WTM, University of Erlangen-Nürnberg; ²ZMP, University of Erlangen-Nürnberg

4:50 PM

Recent Development and Optimization of Forging Process of High Nb-TiAl Alloy: *Xiangjun Xu*¹; Junpin Lin²; Laiqi Zhang²; Yongfeng Liang²; ¹Zhongyuan university of technology; ²University of Science and Technology Beijing

5:10 PM

Microscopic Mechanisms of Spark Plasma Sintering in TiAl Alloys: *Zofia Trzaska*¹; Guillaume Bonnefont²; Alain Couret¹; Jean-Philippe Monchoux¹; ¹CEMES/CNRS; ²MATEIS/CNRS

Integration of Materials Science and Nondestructive Evaluation for Materials Characterization — Quantitative Nondestructive Characterization I

Sponsored by: TMS Structural Materials Division, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Adam Pilchak, Air Force Research Laboratory; Dennis Dimiduk, Air Force Research Lab; Eric Lindgren, Air Force Research Laboratory; Richard Lesar, Iowa State University; Leonard Bond, Iowa State University

Wednesday PM
February 19, 2014

Room: 8
Location: San Diego Convention Center

Session Chairs: Dennis Dimiduk, Air Force Research Laboratory; Richard Lesar, Iowa State University

2:00 PM Invited

An Assessment of Computational Materials Modeling and Simulation for Nondestructive Evaluation in Structural Materials: *Richard LeSar*¹; Dennis Dimiduk²; Nicola Bowler¹; ¹Iowa State University; ²AFRL/RXCM

2:30 PM Invited

Calculations on Ultrasonic Scattering in Polycrystalline Structures Aiming for Nondestructive Materials Characterization and Defect Detection: *Sigrun Hirsekorn*¹; ¹Fraunhofer Institute for Nondestructive Testing (IZFP)

3:00 PM Invited

Ultrasonic Backscattering Measurements of Grain Size in Metal Alloys: *Paul Panetta*¹; ¹Applied Research Associates, Inc.

3:30 PM Break

3:45 PM Invited

Strategies for Ultrasonic Determination of Grain Size Versus Depth in Non-uniform Metal Microstructures: *Ronald Roberts*¹; Frank Margetan¹; Dan Barnard¹; Brady Engle¹; Brittney Pavel¹; ¹Iowa State University

4:15 PM

Modeling the Interaction of Elastic Waves and Microstructure Using Finite Difference: *Adam Pilchak*¹; Thomas Smith²; Michael Groeber¹; ¹Air Force Research Laboratory; ²University of Dayton Research Institute

4:35 PM Invited

A Methodology to Characterize Lattice Elastic Strain Distributions in Processed Alloys Using Spatially-Resolved X-ray Diffraction Data: *Paul Dawson*¹; Matthew Miller¹; Eralp Demir¹; Jun-Sang Park²; ¹Cornell University; ²APS

5:00 PM

Toward an Empirical Prediction of Porosity in Laser-welds of 304L Stainless Steel: *Jonathan Madison*¹; Corbett Battaile¹; Larry Aagesen²; Victor Chan²; Katsuyo Thornton²; ¹Sandia National Laboratories; ²University of Michigan

5:20 PM

X-ray Microscopy for In Situ Characterization of 3D Microstructure Evolution in the Laboratory: *Arno Merkle*¹; Leah Lavery¹; Jeff Gelb¹; ¹Xradia



Light-metal Matrix (Nano)-composites — In-situ Synthesis and Novel Additions

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee, TMS: Magnesium Committee

Program Organizers: Wim Sillekens, European Space Agency; Dmitry Eskin, Brunel University

Wednesday PM Room: 16B
February 19, 2014 Location: San Diego Convention Center

Session Chair: Dmitry Eskin, Brunel University

2:00 PM

Novel Ultrafine-grained (UFG) Aluminium (Al) Metal Matrix Composites (MMCs) Prepared from Fine Atomized Al Powders: *Martin Balog*¹; Frantisek Simancik¹; Peter Krizik¹; Walter Rajner²; Martin Walcher²; Ma Qian³; ¹The Slovak Academy of Sciences; ²New Materials Development GmbH; ³School of Aerospace, Mechanical and Manufacturing Engineering, RMIT University

2:20 PM

The Structure, Phase Composition and Mechanical Properties of Hot Pressed Metal Matrix Nanocomposites Al-A₁₄C₃: *Sergey Vorozhtsov*¹; *Alexander Vorozhtsov*¹; *Sergey Kulkov*¹; ¹Tomsk State University

2:40 PM

Ceramic Dispersions in Metal Castings Created by Direct Injection of a Liquid Organic Precursor into the Melt: *Sudarshan Fnu*¹; *Rishi Raj*¹; ¹University of Colorado at Boulder

3:00 PM

Mechanical Properties of Aluminium-based Nanocomposite Reinforced with Fullerenes: *Kwangmin Choi*¹; *Se-eun Shin*²; *Donghyun Bae*²; *Hyunjoo Choi*¹; ¹Kookmin University.; ²Yonsei University

3:20 PM Break

3:40 PM

The Effect of Mechanically Exfoliated Graphenes Dispersion on the Mechanical Properties of Aluminum/Graphene Composites: *Seeun Shin*¹; *Jiyeon Suh*¹; *Donghyun Bae*¹; ¹Yonsei University

4:00 PM

Development of Al/C₆₀ Composites with Nano-network Structures: *Hyunjoo Choi*¹; *Donghyun Bae*²; ¹Kookmin University; ²Yonsei University

4:20 PM Concluding Comments

Magnesium Technology 2014 — Texture and Wrought Processing I

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Wednesday PM Room: 17A
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Julian Rosalie, NIMS; Eric Nyberg, Pacific Northwest National Laboratory

2:00 PM

Deformation Behavior of ZE₁₀ Magnesium Alloy Sheet: *Patrik Dobron*¹; *Jaroslav Balík*¹; *František Chmelík*¹; *Daria Drozdenko*¹; *Jan Bohlen*²; *Dietmar Letzig*²; *Pavel Lukáč*¹; ¹Charles University in Prague; ²Helmholtz-Zentrum-Geesthacht

2:20 PM

Simulating Microstructure Evolution and Deformation Behavior of Magnesium Alloys Using the Intermediate Phi-model: *Dongsheng Li*¹; *Said Ahzi*²; *Curt Lavender*¹; *Moe Khaleel*³; ¹Pacific Northwest National Laboratory; ²University of Strasbourg; ³Qatar Foundation Research and Development

2:40 PM

Texture Evolution during Grain Growth of Mg Alloy, AZ31B: *Jishnu Bhattacharyya*¹; *Balasubramaniam Radhakrishnan*²; *Govindarajan Muralidharan*²; *Sean Agnew*¹; ¹University of Virginia; ²Oak Ridge National Laboratory

3:00 PM

Effect of Annealing on Microstructure, Texture and Tensile Properties of Twin-roll Cast AZ31B: *Mohsen Masoumi*¹; *Mihriban Pekguleryuz*¹; ¹McGill University

3:20 PM

Influence of Rolling Direction and Temperature on the Texture Formation in Rolled AZ31B Magnesium Alloy: *Litzy Lina Catorcen*⁰; *Nelson de Lima*²; ¹USP-EP University of São Paulo; ²Instituto de Pesquisas Energéticas e Nucleares

3:40 PM Break

4:00 PM

Texture Evolution during Wire Drawing of Mg-RE Alloy: *Mark Chatterton*¹; *Joseph Robson*¹; *Dominic Henry*²; ¹The University of Manchester; ²Magnesium Elektron

4:20 PM

Effect of Composition and Extrusion Temperature on the Microstructure, Strength and Ductility of Ultra-high Strength Mg-Zn-Y Alloys: *Alok Singh*¹; *Yoshiaki Osawa*¹; *Hidetoshi Somekawa*¹; *Toshiji Mukai*²; ¹National Institute for Materials Science; ²Kobe University

4:40 PM Invited

Extrusion of Hollow Magnesium Profiles and Investigation of Extrusion Seams: *Felix Gensch*¹; *René Nitschke*¹; *Sven Gall*¹; *Sören Müller*¹; ¹Extrusion R&D Center, TU Berlin

5:00 PM

Microstructural Evolution and Its Relationship to the Mechanical Properties of Mg AZ₃₁B Friction Stir Back Extruded Tubes: *Justin Milner*¹; *Fadi Abu-Farha*¹; ¹Clemson University

5:20 PM Invited

Effect of Yttrium Addition on Texture Development in a Cast Mg-Al-Y Magnesium Alloy during Compression: *Nabila Tahreen*¹; *Daolun Chen*¹; *Meisam Nouri*²; *Dongyang Li*²; ¹Ryerson University; ²University of Alberta

Magnetic Materials for Energy Applications IV — High Performance Soft Magnets I (This is a joint session with Advanced Materials for Power Electronics, Power Conditioning and Power Conversion II)

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Thomas G. Woodcock, IFW Dresden; Julia Lyubina, Evonik Industries AG; Matthew Willard, Case Western Reserve University

Wednesday PM Room: Ballroom G
February 19, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Matthew A. Willard, Case Western Reserve University; Michael E. McHenry, Carnegie Mellon University

2:00 PM Invited

Magneto-optical Analysis of Magnetic Microstructures: *Rudolf Schaefer*¹; ¹Leibniz Institute for Solid State and Materials Research (IFW) Dresden

2:30 PM Invited

Processing of Soft Magnetic Alloys in High Magnetic Field: *Sophie Rivoirard*¹; ¹CNRS/CRETA

3:00 PM Invited

Recent Advancements in Modeling of Hysteretic Phenomena: *Yevgen Melikhov*¹; ¹Cardiff University

3:30 PM Break

3:45 PM

Nano-magnetism of bcc Fe-based Solid Solutions: *Manfred Wuttig*¹; Abdellah Lisfi²; ¹University of Maryland; ²Morgan State University

4:05 PM Invited

Tailoring of Magnetic Properties and GMI Effect in Thin Amorphous Wires: *Arcady Zhukov*¹; Mihail Ipatov²; Ahmed Talaat²; Juan Blanco³; Valentina Zhukova²; ¹Basque Country University and IKERBASQU; ²Dpto. de Fis. Mater., Basque Country University, UPV/EHU; ³Basque Country University, Dpto. de Física Aplicada

4:35 PM

Soft Magnetic Rapidly Solidified Bilayer Ribbons for Energy Applications: *Ivan Skorvanek*¹; Marek Capik¹; Jozef Marcin¹; Jozef Hoško²; Igor Matko²; Peter Svec²; ¹Institute of Experimental Physics; ²Institute of Physics

4:55 PM

Atomic Scale Analysis of Rapid Annealing Induced Fe-Si Nanocrystals with Strong Creep Induced Anisotropy: *Pradeep Konda Gokuldoss*¹; Giselher Herzer²; Pyuck-Pa Choi¹; Dierk Raabe¹; ¹Max Planck Institute for Iron Research GmbH; ²Vacuumschmelze GmbH&Co.KG

5:15 PM

Effects of Elastic Interactions on Domain Structures in Terfenol-D: *Ben Wang*¹; Yongmei Jin¹; ¹Michigan Technological University

Materials Aspects of Corrosion and Fouling in Oil Refining and Exploration — Session II

Sponsored by: TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee

Program Organizer: David Mitlin, University of Alberta and NINT NRC

Wednesday PM
February 19, 2014

Room: Mission Hills
Location: San Diego Marriott Marquis & Marina

Session Chair: To Be Announced

2:00 PM Invited

Recent Developments in Oil and Gas Production: *Raul Rebak*¹; ¹GE Global Research

2:20 PM Invited

Rising Challenges for the Petroleum Refiners in Managing Corrosion Risks: *Ming Wei*¹; ¹BP Products North America, Inc

2:40 PM Invited

Nonmagnetic Materials and Their Challenges Regarding Corrosion Resistance in the Exploration of Subterranean Energy Sources: *Vladimir Jovancevic*¹; Helmuth Sarmiento-Klapper¹; Denis Kopecki¹; ¹Baker Hughes

3:00 PM Invited

Corrosion-fouling of 316 Stainless Steel and Pure Iron by Hot Oil: *David Mitlin*¹; Tyler Stephenson¹; Mike Hazelton¹; ¹University of Alberta and NINT NRC

3:20 PM Break

3:30 PM Invited

An Overview of Stress Cracking of Pipeline Steels in Near-neutral pH Environments: *Weixing Chen*¹; ¹University of Alberta

3:50 PM Invited

Protective Effect of Sulfide Scales Formed with Crude Fraction and Exposed to Naphthenic Acids Challenges: *Gheorghe Bota*¹; ¹Ohio University - Institute for Corrosion and Multiphase Technology

4:10 PM Invited

Some Aspects of Corrosion Inhibitors Strongly Acidic Environments: *Gordon Burstein*¹; ¹University of Cambridge

4:30 PM Invited

The Corrosivity of Linepipe Mild Steel in an Environment Containing Microbes Cultivated from an Oil Reservoir: *Faisal AlAbbas*¹; *Brajendra Mishra*²; David Olson²; ¹Saudi Aramco; ²Colorado School of Mines

4:50 PM Invited

Corrosion Issues of Advanced Steels in Exploration of Oil and Gas Wells: *Malgorzata Ziomek-Moroz*¹; ¹U.S. Department of Energy, National Energy Technology Laboratory

Materials for High-temperature Applications: Next Generation Superalloys and Beyond — Superalloys

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Refractory Metals Committee

Program Organizers: Omer Dogan, DOE National Energy Technology Laboratory; Panos Tsakirooulos, University of Sheffield; Xingbo Liu, West Virginia University; Paul Jablonski, DOE National Energy Technology Lab; Junpin Lin, University of Science and Technology Beijing

Wednesday PM
February 19, 2014

Room: 6D
Location: San Diego Convention Center

Session Chairs: Joe Rigney, GE Aviation; Brian Cockeram, Bettis Atomic Power Lab

2:00 PM

Is Ruthenium Really Necessary in the Next-generation Superalloys for Single Crystal Turbine Blades?: *Pierre Caron*¹; ¹ONERA

2:20 PM

High Temperature Response of Single Crystal (SC) Nickel Superalloys: *Amit Pandey*¹; Kevin Hemker²; ¹Oak Ridge National Laboratory; ²The Johns Hopkins University

2:40 PM

Hot Deformation Characteristics of a Polycrystalline γ - γ' - δ Ternary Eutectic Ni-base Superalloy: *Martin Detroids*¹; *Randolph Helminck*²; *Sammy Tin*¹; ¹Illinois Institute of Technology; ²Rolls Royce Corporation

3:00 PM

Effects of Cooling Rates after Solution Heat Treatment on the Creep Behavior of Directionally Solidified CM-247LC Superalloy: *Mau-Sheng Chiou*¹; *An-Chou Yeh*²; *Sheng-Rui Jian*¹; *Chen-Ming Kuo*¹; ¹I-Shou University; ²National Tsing Hua University

3:20 PM

Fabrication of 3D Woven and 3D Braided Ni-based Superalloys: *Dinc Erdeniz*¹; *Keith Sharp*²; *David Dunand*¹; ¹Northwestern University; ²3TEX Incorporated

3:40 PM Break

3:55 PM

Mechanical Behavior and Microstructure Evolution of AD730 Superalloy: *Timur Khismatullin*¹; ¹Advanced Forming Research Centre, University of Strathclyde

4:15 PM

Development of a Si-bearing DS Superalloy: *Kuo-Cheng Yang*¹; *Yao-Jen Chang*¹; *An-Chou Yeh*¹; *Jien-Wei Yeh*¹; ¹National Tsing Hua University

4:35 PM

Grain Boundary Engineering in Alloy 800H/HT via Thermo-mechanical Processing: *Hamed Akhiani*¹; *Majid Nezakat*¹; *Jerzy Szpunar*¹; ¹University of Saskatchewan

4:55 PM

Heat Treatment Effects on the High Temperature Creep Behavior of Directionally Solidified Mar-M₂₄₇ Superalloy: *An-Chou Yeh*¹; *Wei-Bin He*²; *Sheng-Rui Jian*²; *Hui-Yun Bor*³; *Chao-Nan Wei*³; *Chen-Ming Kuo*²; ¹National Tsing Hua University; ²I-Shou University; ³Chung-Shan Institute of Science and Technology

5:15 PM

Microstructural and Properties Evolution of 800H Superalloy during Grain Boundary Engineering Processes: *Ya-Hsun Huang*¹; *Te-Kang Tsao*¹; *An-Chou Yeh*¹; *Shih-Chin Chang*¹; ¹National Tsing Hua University



Mechanical Behavior at the Nanoscale II — Micro/Nano-crystalline Materials

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Wednesday PM
 February 19, 2014

Room: 9
 Location: San Diego Convention Center

Session Chairs: T. John Balk, University of Kentucky; Yong-Wei Zhang, Institute of High Performance Computing

2:00 PM Invited

Internal Structure, Size and Surface Effects on the Plasticity and Failure of Metallic Nanowires: *Yong-Wei Zhang*¹; Zhaoxuan Wu¹; Mark Jhon¹; Julia Greer²; David Srolovitz³; ¹Institute of High Performance Computing; ²Division of Engineering and Applied Science, California Institute of Technology; ³Departments of Materials Science and Engineering & Mechanical Engineering and Applied Mechanics

2:30 PM Invited

Tailoring Grain Boundary Structure to Control the Mechanical Behavior of Nanocrystalline Alloys: *Timothy Rupert*¹; ¹University of California, Irvine

3:00 PM

Small Activation Volume and Negative Activation Entropy of Short-circuit Diffusion in Nanocrystal: *Yunjiang Wang*¹; Guo-Jie Gao²; Shigenobu Ogata²; ¹Kyoto University; ²Osaka University

3:20 PM

Direct Measurement of the Effect of Applied Stress on Texture Transformations in Thin Ag Films: *Shefford Baker*¹; Ming-Tzer Lin²; Markus Chmielus¹; Howie Jores¹; Kyle Visser¹; Arthur Woll¹; Elizabeth Ellis¹; Richard Vinci¹; Walter Brown¹; ¹Cornell University; ²National Chung Hsing University

3:40 PM Break

3:55 PM Invited

High Temperature Mechanical Behaviour of Al/SiC Multilayers: *Jon Molina-Aldareguia*¹; Saeid Lotfian¹; Carl Mayer²; Nikhilesh Chawla²; Javier LLorca¹; Amit Misra³; ¹IMDEA Materials Institute; ²Arizona State University; ³Los Alamos National Laboratory

4:25 PM

Deformation Behavior of Nanotwinned Thin Films from In Situ Synchrotron X-ray Experiments: *Ryan Ott*¹; Matthew Besser¹; Eun Soo Park¹; Matthew Kramer¹; ¹Ames Laboratory (USDOE)

4:45 PM

Counting Dislocations in Micro-crystals with Coherent X-rays: Ex Situ and In Situ Studies of the Plastic Deformation of InSb Micro-pillars: Vincent L.R. Jacques¹; Geradina Carbone²; Rudy Ghisleni²; *Ludovic Thilly*⁴; ¹Laboratoire de Physique des Solides; ²ESRF; ³EMPA; ⁴University of Poitiers

5:05 PM

Room Temperature In Situ Transmission Electron Microscopy Plastic Deformation of 6H-SiC and Its Mechanism: *Sara Kiani*¹; Suneel Kodambaka¹; Andrew Minor²; Jenn-Ming Yang¹; ¹UCLA; ²UC Berkeley AND Lawrence Berkeley National Lab

5:25 PM

Mechanical Properties and Scaling Behavior of Bulk Nanoporous Gold and Iridium: Nicolas Briot¹; Lei Wang¹; *T. John Balk*¹; ¹University of Kentucky

Mechanical Behavior Related to Interface Physics II — Grain Boundary Effects on Mechanical Deformation

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Nan Li, Los Alamos National Laboratory; Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Tonya Stone, Mississippi State University

Wednesday PM
 February 19, 2014

Room: 11A
 Location: San Diego Convention Center

Session Chairs: Marisol Koslowski, Purdue University; Tamer Crosby, UCLA

2:00 PM Invited

Emission of Dislocations from Grain Boundaries: *Richard Hoagland*¹; Saryu Fensin¹; Steve Valone¹; ¹LANL

2:30 PM Invited

Understanding the Role of Grain Boundaries during Deformation Using Spherical Nanoindentation and Orientation Imaging Microscopy: *Surya Kalidindi*¹; Shraddha Vachhani¹; ¹Georgia Institute of Technology

3:00 PM

Atomistic and Electron Tomography Study of 3D Dislocation-grain Boundary Interaction in BCC Metals: *Zhi Zeng*¹; Ting Zhu¹; ¹Georgia Institute of Technology

3:20 PM Break

3:40 PM Invited

Temporal and Spatial Stochasticity of Plastic Flow in Small Volumes: *Tamer Crosby*¹; Giacomo Po¹; Nasr Ghoniem¹; ¹UCLA

4:10 PM Invited

Reverse Plastic Strain in Polycrystalline Materials: *Marisol Koslowski*¹; Yuesong Xie¹; ¹Purdue University

4:40 PM

Modelling and Understanding the Strength of Grain Boundaries Based on Ab-initio Results: *Rebecca Janisch*¹; Xueyong Pang¹; Arshad Tahir¹; Alexander Hartmaier¹; ¹ICAMS

Multiscale Approaches to Hydrogen-assisted Degradation of Metals — Meso & Macro-scale Modelling of H-microstructure Interactions

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Nicholas Winzer, Fraunhofer IWM; Matous Mrovec, Fraunhofer IWM; Brian Somerday, Sandia National Laboratories; Petros Sofronis, University of Illinois; David Bahr, Purdue University; Srinivasan Rajagopalan, ExxonMobil Research and Engineering Company

Wednesday PM
 February 19, 2014

Room: 11B
 Location: San Diego Convention Center

Session Chairs: Petros Sofronis, University of Illinois at Urbana-Champaign; Xavier Feaugas, Université de La Rochelle

2:00 PM Invited

Hydrogen-defect Interactions in the Framework of the Defactant Concept: *Reiner Kirchheim*¹; ¹University of Goettingen

2:40 PM

Simulating Hydrogen Embrittlement and Fast Pathways for Diffusion through Localization Elements: *James Foulk*¹; WaiChing Sun¹; Jakob Ostien¹; Alejandro Mota¹; ¹Sandia National Laboratories

3:00 PM

A Re-examination of the Modeling of Solutes and Their Interactions with Other Defects: *Ryan Sills*¹; Wei Cai¹; David Barnett¹; William Nix¹; ¹Stanford

University

3:20 PM

Diffusion-coupled Hybrid Cohesive Zone Model for Hydrogen Embrittlement Analysis: Zhaoyu Jin¹; Jun Song¹; ¹McGill University

3:40 PM Break

4:00 PM Invited

Modeling of Gaseous Impurity Inhibition of Hydrogen Environment Embrittlement: Brian Somerday¹; Alex Staykov²; Petros Sofronis³; Reiner Kirchheim⁴; ¹Sandia National Laboratories; ²International Institute for Carbon Neutral Energy Research; ³University of Illinois; ⁴Georg-August-Universität Göttingen

4:40 PM

Simulating Hydride Precipitation in Zirconium by an Elastic Phase Field Model: Jacob Bair¹; Mohsen Asle Zaeem¹; ¹Missouri University of Science and Technology

5:00 PM

Random-walk Based Continuum Model of Hydrogen Diffusion and Trapping in Metals: Jesus Toribio¹; Viktor Kharin¹; ¹University of Salamanca

Multiscale Perspectives on Plasticity in HCP Metals — Mechanisms & Microstructures I

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

Program Organizers: Benjamin Morrow, Los Alamos National Laboratory; Suveen Mathaudhu, Ellen Cerreta, Los Alamos National Laboratory; Juan P. Escobedo, The University of New South Wales Canberra; Dallas Trinkle, University of Illinois, Urbana-Champaign

Wednesday PM

Room: 6C

February 19, 2014

Location: San Diego Convention Center

Session Chair: Ellen Cerreta, Los Alamos National Laboratory

2:00 PM Invited

Connection between the II Fault and c+a Slip: Sean Agnew¹; Laurent Capolungo²; Christopher Calhoun¹; ¹University of Virginia; ²Georgia Institute of Technology

2:20 PM

Cyclic Loading Experiments and Crystal Plasticity Modeling of Mg AZ31: Matthew Priddy¹; David McDowell¹; ¹Georgia Institute of Technology

2:40 PM

Microstructural Investigation of Twin Boundaries in HCP Metals and Implications Towards Mechanical Behavior: Benjamin Morrow¹; Rodney McCabe¹; Ellen Cerreta¹; Carlos Tomé¹; ¹Los Alamos National Laboratory

3:00 PM

Characterization and Modeling of High Strain-rate Tensile Deformation in Zirconium: Juan P. Escobedo¹; Ellen Cerreta¹; Carl Trujillo¹; Ricardo Lebensohn¹; Daniel Martinez²; George Gray III¹; ¹Los Alamos National Laboratory

3:20 PM

Micro-cantilever Testing of Hexagonal Close Packed Metals and Alloys: Angus Wilkinson¹; Jicheng Gong¹; ¹University of Oxford

3:40 PM Break

4:00 PM Invited

In Situ Characterization on Oxygen Impurity Effects in α -Titanium: Qian Yu¹; Rachel Traylor¹; Liang Qi¹; John Morris¹; Mark Asta¹; Daryl C Chrzan¹; Andrew Minor²; ¹UC Berkeley; ²LBNL

4:20 PM

Effect of Alloying Elements on Twin Activity in Ti and Zr: Michael Preuss¹; Leo Prakash¹; Arnas Fitzner¹; Joao Quinta da Fonseca¹; ¹University of Manchester

4:40 PM

Multiscale Effects of Twin-induced Strain Localizations in Mg Alloys: Kavan Hazeli¹; Jefferson Cuadra¹; Prashanth Vanniamparambil¹; Antonios Kotsos¹; ¹Drexel University

5:00 PM

Modelling Twin Clustering and Its Effect on Formability: Gabor Timar¹; Joao Fonseca¹; ¹The University of Manchester

Nanoparticulate Materials: Production, Consolidation and Characterization — Consolidation III: Novel Consolidation Techniques

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

Program Organizers: Brady Butler, U.S. Army Research Laboratory; Eugene Olevsky, San Diego State University

Wednesday PM

Room: Carlsbad

February 19, 2014

Location: San Diego Marriott Marquis & Marina

Session Chair: James Wollmershauser, Naval Research Laboratory

2:00 PM Invited

Bulk Single Phase Nanocrystalline Ceramics by Integrated High Pressure Consolidation: Boris Feigelson¹; James Wollmershauser¹; ¹US Naval Research Laboratory

2:30 PM

Al-Ni Energetic Composites Produced from Nano-thickness Flakes by Ultrasonic Powder Consolidation: Dinc Erdeniz¹; Teiichi Ando²; ¹Northwestern University; ²Northeastern University

2:50 PM

Morphology of Yttria Partially Stabilized Zirconia during Cryomilling and Thermomechanical Processing: Matthew Dussing¹; Hanry Yang¹; Troy Topping¹; Enrique Lavernia¹; Julie Schoenung¹; ¹UC Davis

3:10 PM

Yttria and Alumina Nano-scale Oxide-dispersion-strengthened (ODS) 316 Stainless Steels: Chen Dai¹; Chris Schade²; Enrique Lavernia¹; Diran Apelian²; ¹University of California, Davis; ²Hoeganaes Corporation

3:30 PM Break

3:50 PM Invited

Fully Dense Oxide-free Nanocomposite Magnets and Nanostructured Semiconductor Thermoelectrics Produced by High Pressure Consolidation: James Wollmershauser¹; Boris Feigelson¹; ¹US Naval Research Laboratory

4:20 PM

Enhanced Sintering Mechanism in Nanocrystalline Powders Undergoing Phase Separation: Mansoo Park¹; Christopher Schuh¹; ¹MIT

4:40 PM

Multi-scale Modeling of Sintering of Agglomerated Nano-powders: Jose Alvarado-Contreras¹; Diletta Giuntini¹; Andrey Maximenko¹; Eugene Olevsky¹; ¹San Diego State University

5:00 PM

Synthesis of Copper Nanoparticles for Inkjet Printing Technology: Giuseppe Granata¹; Taisi Yamaoka¹; Akio Fuwa¹; ¹Waseda University



Nanostructured Materials for Rechargeable Batteries and Supercapacitors II — Session VI

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: David Millin, University of Alberta and NINT NRC; Reza Shahbazian-Yassar, Michigan Technological University; Peter Kalisvaart, University of Alberta and NINT NRC

Wednesday PM Room: Ballroom F
February 19, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Shirley Meng, UC San Diego; Reza Shahbazian-Yassar, Michigan Technological University

2:00 PM Invited

The Development of Two Dimensional Materials for Energy Storage: *Guillaume Muller*¹; Bruce Dunn¹; ¹UCLA - Department of Materials Science and Engineering

2:15 PM Invited

3-Dimensional Nanostructured Silicon Electrodes for Use in Li Ion Batteries: *Julia Greer*¹; X Gu¹; Sarah Mitchell¹; Satyajit Das¹; Michael Ortiz¹; ¹California Institute of Technology

2:30 PM Invited

Coupled Electrochemical Cycling and TEM Characterization of Individual Nanostructures for Energy Storage Materials: *Katherine Jungjohann*¹; Yang Liu¹; Kevin Zavadil¹; Tom Harris¹; Andrew Leenheer¹; John Sullivan¹; Nathan Hahn¹; Katharine Harrison¹; ¹Sandia National Laboratories

2:45 PM Invited

Effect of Ionic liquids on Li-sulfur Battery Performance: *Surya Moganty*¹; ¹NOHMs Technologies

3:00 PM Invited

High-throughput Search for Dual-functioning Electrocatalyst/Electrode Li-O₂ Cells from First-principles Thermochemical Database: *Scott Kirklin*¹; Maria Chan²; Lynn Trahey²; Michael Thackeray²; Chris Wolverton¹; ¹Northwestern University; ²Argonne National Laboratory

3:15 PM Invited

Understanding Capacitance Variation with the Pore Size in Electric Double-layer Capacitors: *De-en Jiang*¹; ¹Oak Ridge National Laboratory

3:30 PM Break

3:45 PM Invited

Lithiation Induced Stresses and Interfacial Phenomena in Li Ion Battery Electrodes: *Brian Sheldon*¹; Anton Tokranov¹; Ravi Kumar¹; Xingcheng Xiao²; Peng Lu²; Yue Qi²; ¹Brown University; ²General Motors

4:00 PM Invited

Mesoscale Electrode Physics in Lithium-ion Batteries: *Partha Mukherjee*¹; Pallab Barai¹; Zhixiao Liu¹; ¹Texas A&M University

4:15 PM Invited

Nanocomposite Cathodes and Barrier Layers for Long-life Lithium Sulfur Batteries: *Jocelyn Hicks-Garner*¹; Adam Gross¹; John Wang¹; John Vajo¹; *Jason Graetz*¹; ¹HRL Laboratories, LLC

4:30 PM Invited

Three-dimensional Nanofiber-based Electrode Architecture for Supercapacitors: *Vibha Kalra*¹; ¹Drexel University

4:45 PM Invited

TiO₂ Nanosheet Assemblies as Lithium Ion Battery Anodes at Elevated Temperatures: *Wei Zhang*¹; *Dawei Liu*¹; ¹Alfred University

5:00 PM Invited

Dynamic Phenomena in Complex Oxides during Electrochemical Processes in Li ion and Na Ion Batteries: *Shirley Meng*¹; ¹U.C. San Diego

5:15 PM Invited

In Situ Transmission Electron Microscopy of Lithium Storage in Nanomaterials: *John Cumings*¹; ¹University of Maryland

5:30 PM

Hierarchical MnO₂ Nanosheet-built Nanotubes for Electrochemical Capacitor Electrodes: *Yuxin Zhang*¹; Ming Huang¹; ¹Chongqing University

Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World — Static and Dynamic Displacements

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

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kosterz, ETH; Brent Fultz, California Institute of Technology; Peter Liaw, The University of Tennessee

Wednesday PM Room: 10
February 19, 2014 Location: San Diego Convention Center

Session Chairs: Chen Li, ORNL; Luca Gelisio, University of Trento

2:00 PM Keynote

Powder Diffraction and Lattice Dynamics of Nanocrystals: *Paolo Scardi*¹; ¹University of Trento

2:40 PM Invited

Synchrotron Laue X-ray Microdiffraction Imaging: *Nobumichi Tamura*¹; ¹Lawrence Berkeley National Lab.

3:05 PM

Optimising Time Resolved Strain Resolution with Micro-laue X-ray Diffraction: *T Ben Britton*¹; Luc Vandeperre¹; Finn Giuliani¹; ¹Department of Materials, Imperial College

3:20 PM

An Atomistic Approach to Diffraction: *Luca Gelisio*¹; Paolo Scardi¹; ¹University of Trento

3:35 PM Break

3:55 PM Invited

Neutron and X-ray Scattering Investigations of Microscopic Energy Transport: *Olivier Delaire*¹; ¹Oak Ridge National Laboratory

4:20 PM Invited

Strain Mechanisms in Polycrystalline BaTiO₃ Measured at the Single Grain Level during In Situ Electrical Poling: *Jette Oddershede*¹; Marta Majkut¹; John Daniels²; Wook Jo³; Soren Schmidt¹; ¹DTU Physics; ²University of New South Wales; ³TU Darmstadt

4:45 PM

Phonon Dynamics in SnTe: *Chen Li*¹; Olivier Delaire¹; Xin Chen¹; David Singh¹; Andrew May¹; Jie Ma¹; Zhiting Tian²; Gang Chen²; Michael McGuire¹; Georg¹; Andrew Christianson¹; Ashfia Huq¹; ¹Oak Ridge National Laboratory; ²Massachusetts Institute of Technology

5:00 PM

Small Angle X-ray Scattering Study of ω Phase in Metastable β Titanium Single Crystals: *Jana Šmilauerová*¹; Miloš Janeczek¹; Václav Holý¹; Jan Ilavský²; ¹Charles University; ²Argonne National Laboratory

5:15 PM

Synchrotron X-ray Diffraction Study of the Plasticity of Bulk Metallic Glass Composites: *Jiawei Mi*¹; ¹University of Hull

Pb-free Solders and Emerging Interconnect and Packaging Materials — Interfacial Reactions and Fatigue

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch Automovtive

Wednesday PM
February 19, 2014

Room: 5B
Location: San Diego Convention Center

Session Chairs: Won Sik Hong, Korea Electronics Technology Institute; Polina Snugovskiy, Celestica

2:00 PM

Interfacial Microstructures and Brittle Fracture Behavior of Solder Joints on ENIG and ENEPIG Surface Finishes: *Kyoung-Ho Kim*¹; Wonil Seo¹; Kang-Dong Kim²; Deok-Gon Han³; Tae-Hyun Sung³; Tae-Ho Lee³; Sehoon Yoo¹; ¹Korea Institute of Industrial Technology; ²Samsung Electro-Mechanics; ³MK CHEM&TECH

2:20 PM

Electrical Contact Resistance of Pb-free Solders: *Fay Hua*¹; ¹Intel Corporation

2:40 PM

Phase Transformation in the Early Stage of Soldering Reaction between Sn-Ag-Cu and a Submicron Ni(P) Film: *Shih-Ju Wang*¹; Chia-Wei Fan¹; Wei-Hsiang Wu¹; *Cheng-En Ho*¹; ¹Yuan Ze University

3:00 PM

The Evolution of Microstructure and Mechanical Strength Affected by Adding Pd in Co-based Surface Finishes: *Chun-Hao Huang*¹; Jia-Hong Hong¹; Albert T. Wu¹; ¹National Central University

3:20 PM Break

3:40 PM

Thermal Fatigue Reliability of LED Joints on Aluminium Substrate at SnAgCu+Sb and SnAgCu+Bi Alloys: *Minoru Ueshima*¹; ¹Senju Metal Industry

4:00 PM

Relation between the Fatigue Life of SnAgCu Pb-Free Solder Joints and both Composition and Thermal History: *Francis Mutuku*¹; Babak Arfaei²; Eric Cotts¹; ¹Binghamton University; ²Universal Instruments

4:20 PM

Assessing Solder Joint Fatigue Life under Realistic Service Conditions: *Sa'D Hamasha*¹; Mazin Obaidat¹; Sulman Majeed¹; Peter Borgesen¹; ¹Binghamton University

4:40 PM

Drop and High Speed Impact Response for Multi-level Assembly Packaging with Slightly Significant Pd or Ni(P) Layer Deposit under Thermal Treatment: *Hsiu-Min Lin*¹; Cheng-Ying Ho¹; Wen-Lin Chen¹; Yi-Hsin Wu¹; De-Hui Wang²; Jun-Ren Lin²; Yu-Hui Wu²; Huei-Cheng Hong²; Zhi-Wei Lin²; Jenq-Gong Duh¹; ¹Materials Science and Engineering, National Tsing Hua University; ²Kinsus Interconnect Technology Corporation

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIII — General Issues in Microelectronics and Energy Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Chao-hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikuo Ohnuma, Tohoku University; Clemens Schmetterer, Forschungszentrum Juelich, Inst.; Yee-Wen Yen, National Chung Cheng University; Shien Ping Feng, The University of Hong Kong; Shih-Kang Lin, National Cheng Kung University

Wednesday PM
February 19, 2014

Room: 32A
Location: San Diego Convention Center

Session Chairs: Chih-Ming Chen, National Chung Hsing University; Ikuo Ohnuma, Tohoku University

2:00 PM Invited

Ag Decorated Al Nanoparticles as Novel Ink Materials for Printed Electronics Applications: *Yung Jong Lee*¹; Na Rae Kim¹; Jahyun Koo¹; *Hyuck Mo Lee*¹; ¹KAIST

2:20 PM Invited

Chemical and Thermal Reductions of Carboxylate-protected Nanoparticle-based Ag Conductive Films: *Jenn-Ming Song*¹; Kun-Hung Hsieh¹; Tsung-Yun Pai¹; ¹National Chung Hsing University

2:40 PM

Synthesis, Microstructures and Properties of High Strength-high Conductivity Cu-Mg Alloys: *Stephane Gorsse*¹; Blanche Ouvrard¹; Angeline Poulon¹; Mohamed Gouné¹; Yannick Champion²; ¹ICMCB-CNRS; ²ICMPE

3:00 PM

Metallization on Indium Tin Oxide Plastic Substrate by Potential-sweeping Electroplating: *Hau Nga Yu*¹; Ya-Huei Chang¹; Yu-Ting Huang¹; Shien-Ping Feng¹; ¹The University of Hong Kong

3:20 PM Break

3:40 PM Invited

Electroplating Ni-Au Low Ohmic Contacts on Nanostructured Bi₂Te₃ Alloys: *Shien Ping Feng*¹; Ya-Huei Chang¹; ¹The University of Hong Kong

4:00 PM

Low-temperature Synthesis of Cu Interconnects on Glass Using Cu(Mg) Alloy Films: *Kazuhiro Ito*¹; Keiji Hamasaka²; *Kazuyuki Kohama*¹; Yasuharu Shirai²; Masanori Murakami³; ¹Osaka University; ²Kyoto University; ³The Ritsumeikan Trust

4:20 PM

Synthesis of Low Contact-resistance Cu(Ti)/ITO Junctions: *Kazuhiro Ito*¹; Wataru Nakagawa²; Yasuharu Shirai²; Masanori Murakami³; ¹Osaka University; ²Kyoto University; ³The Ritsumeikan Trust

4:40 PM

Effect of Layer Direction on the Interfacial Reactions between Bismuth Telluride and Tin-based Solder: *Shan Ye*¹; Chih-Ming Chen¹; ¹National Chung Hsing University

5:00 PM

Wetting Behavior of Solders on ENIG and ENEPIG Metallization without Flux: *Wen Ning Chuang*¹; C.Y. Liu¹; ¹National Central University



Phase Transformation and Microstructural Evolution — Processing and Microstructural Evolution I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Wednesday PM
February 19, 2014

Room: 31C
Location: San Diego Convention Center

Session Chairs: John Gibbs, Northwestern University; Amy Clarke, Los Alamos National Laboratory

2:00 PM Invited

Surface Precipitation in Engineering Alloys: *Christopher Hutchinson*¹; Yu Chen¹; Xiya Fang¹; Yves Brechet²; ¹Monash University; ²Institute National Polytechnique de Grenoble

2:30 PM

Quantitative Characterization and Modeling of Precipitation during Quench in the Heat Treatable 7449 Aluminium Alloy: *Patrick Schloth*¹; Julia Repper²; Charles-André Gandin³; Frédéric de Geuser⁴; Alexis Deschamps⁴; Helena Van Swygenhoven²; Jean-Marie Drezet¹; ¹EPFL; ²Paul Scherrer Institut; ³CEMEF UMR CNRS-ENSMP 7635; ⁴SIMAP, INP Grenoble

2:50 PM Invited

Evolution of Precipitate Nuclei during Age-hardening: *Peter Liddicoat*¹; Simon Ringer¹; ¹The University of Sydney

3:20 PM

Phase Field Crystal Modeling and Atomic-scale Characterization of Clustering in Al-Mg-Si Alloys: *Vahid Fallah*¹; Andreas Korinek²; Mark Gallerneault³; Nana Ofori-opoku²; Nikolas Provatas⁴; Shahrzad Esmaceli¹; ¹University of Waterloo, Mechanical and Mechatronics Engineering Department; ²McMaster University, Department of Materials Science and Engineering; ³Novelis Inc.; ⁴McGill University, Department of Physics

3:40 PM Break

3:55 PM

Microstructure and Property Changes in Metallic Alloys Induced by Advanced Mechanical Surface Treatments: *Amrinder Gill*¹; Abhishek Telang¹; Chang Ye¹; Zhong Zhou²; Seetha Mannava¹; Dong Qian²; *Vijay Vasudevan*¹; ¹University of Cincinnati; ²University of Texas at Dallas

4:15 PM

In Situ X-ray Tomographic Microscopy Study of the Evolution of Aluminide Coatings on Ni-20Cr Wires: *Ashley Ewh*¹; Dinc Erdeniz¹; Matthew Glazer¹; Thomas Philippe¹; Julie Fife²; Peter Voorhees¹; David Dunand¹; ¹Northwestern University; ²Swiss Light Source

4:35 PM

Nanosecond-scale Multi-frame TEM of Phase Transformations: Measuring Crystal Growth Rates during Laser Annealing of Amorphous Phase Change Materials: *Melissa Santala*¹; Simone Raoux²; Teya Topuria³; Bryan Reed¹; Thomas LaGrange¹; Geoffrey Campbell¹; ¹Lawrence Livermore National Laboratory; ²IBM Watson Research Center; ³IBM Research Almaden

4:55 PM

Coarsening Dynamics in Two-phase Mixtures: Interfacial Velocity Distributions: *John Gibbs*¹; Peter Voorhees¹; ¹Northwestern University

5:15 PM

Analysis of Precipitation Reaction Kinetics: Kinetic Model vs. Experiments: *Bastian Rheingans*¹; Eric Mittemeijer²; ¹Institute for Materials Science, University of Stuttgart; ²Institute for Materials Science, University of Stuttgart / Max Planck Institute for Intelligent Systems

5:35 PM

A Phase Field Crystal Study of Nucleation and Growth during a Polymorphic Transformation: *Tao Yang*¹; Yipeng Gao¹; Rongpei Shi¹; Jiahong Ke¹; Yunzhi Wang¹; ¹Ohio State University

Radiation Effects in Oxide Ceramics and Novel LWR Fuels — Multi-scale Modeling of Radiation-induced Microstructure Evolution in Oxide Ceramics

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

Program Organizers: Xian-Ming Bai, Idaho National Laboratory; Todd Allen, Idaho National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Jianliang Lin, Colorado School of Mines; Michele Manuel, University of Florida; Dragos Staicu, European Commission, Joint Research Centre, Institute for Transuranium Elements; Yong Yang, University of Florida

Wednesday PM
February 19, 2014

Room: 33B
Location: San Diego Convention Center

Funding support provided by: The Center for Materials Science of Nuclear Fuel (CMSNF), an Energy Frontier Research Center led by the Idaho National Laboratory

Session Chairs: Blas Uberuaga, Los Alamos National Laboratory; Michael Tonks, Idaho National Laboratory

2:00 PM Invited

UO₂ Fission Gas Release Rates from Atomistic Calculations of Intrinsic and Radiation-enhanced Diffusion Coefficients: *David Andersson*¹; Xiang-Yang Liu¹; Giovanni Pastore²; Michael Tonks²; Paul Millett³; Boris Dorado⁴; Philippe Garcia⁵; Blas Uberuaga¹; Chris Stanek¹; ¹Los Alamos National Laboratory; ²Idaho National Laboratory; ³University of Arkansas; ⁴CEA, DAM, DIF; ⁵CEA, DEN, DEC, Centre de Cadarache

2:30 PM

Irradiation-induced Grain Growth in Nanocrystalline Ceria: *William Weber*¹; Dilpuneet Aidhy²; Yanwen Zhang²; ¹University of Tennessee; ²Oak Ridge National Laboratory

2:50 PM

Modeling of Grain Growth in UO₂ under a Temperature Gradient: *Michael Tonks*¹; Yongfeng Zhang¹; Xianming Bai¹; ¹Idaho National Laboratory

3:10 PM

Molecular Dynamics Study of Grain Boundary Properties in UO₂: *Joseph Carmack*¹; Yongfeng Zhang¹; ¹Idaho National Laboratory

3:30 PM Break

3:50 PM Invited

Multiscale Computer Simulation of Fission Gas Release in Oxide Fuels: *Paul Millett*¹; Michael Tonks²; Yongfeng Zhang²; Bulent Biner²; ¹University of Arkansas; ²Idaho National Laboratory

4:20 PM

Electrochemical Effect of Void Ensembles in UO₂: *Abdel-Rahman Hassan*¹; Janne Pakarinen²; Michele Manuel³; Anter El-Azab¹; ¹Purdue University; ²University of Wisconsin-Madison; ³University of Florida

4:40 PM

Segregation of Fission Products to Dislocations in Uranium Dioxide: *Anuj Goyal*¹; Bowen Deng¹; Minki Hong¹; Aleksandr Chernatynskiy¹; Susan Sinnott¹; Simon Phillpot¹; ¹University of Florida

Shape Casting: 5th International Symposium — Solidification and Microstructure I

Sponsored by: TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS: Aluminum Committee, TMS: Solidification Committee
Program Organizers: Murat Tiryakioglu, University of North Florida; John Campbell, University of Birmingham; Glenn Byczynski, Nemak Canada

Wednesday PM Room: 17B
February 19, 2014 Location: San Diego Convention Center

Session Chair: To Be Announced

2:00 PM

Thermodynamics-based Computational Approach to AL-CU Alloys: Grain Refinement: Jiehua Li¹; Carmen Promer²; Albert Jahn²; B. Oberdorfer²; S. Wurster¹; F. Martin¹; *Peter Schumacher*³; ¹University of Leoben; ²Austrian Foundry Research Institute; ³University of Leoben, Austrian Foundry Research Institute

2:20 PM

Control Diffusion Solidification(CDS): An Overview of Mechanism and Application: *Sumanth Shankar*¹; Reza Ghiaasiaan¹; Diran Apelian²; ¹McMaster University; ²Worcester Polytechnic Institute

2:40 PM

Correlation between Melt Quality and Fluidity of A356: Baris Akkaya¹; Emine Erturk¹; Derya Dispinar¹; ¹Istanbul University

3:00 PM

Fluidity Characteristics of A356 Alloy with Various Thickness Sectioned New Test Mould: Murat Colak¹; Ramazan Kayikci¹; *Derya Dispinar*²; ¹Sakarya University; ²Istanbul University

3:20 PM

Effect of Feeder Configuration on the Microstructure of Ductile Cast Iron: *Nikolaj Vedel-Smith*¹; Niels Tiedje¹; ¹Technical University of Denmark

3:40 PM Break

3:50 PM

Analysis of Heterogeneous Nucleation in Ductile Iron: *Simon Lekakh*¹; ¹MST

4:10 PM

The External and Internal shrinkages in Aluminum Gravity Castings: *Fu-Yuan Hsu*¹; Shin-Wei Wang¹; Huey-Juan Lin¹; ¹National United University

4:30 PM

Effect of Si and Cu Content on the Size of Intermetallic Phase Particles in Al-Si-Cu-Mg-Fe Alloys: *Tharmalingam Sivarupan*¹; Carlos H Caceres²; John Andrew Taylor¹; ¹CAST CRC Ltd.; ²ARC-Centre of Excellence for Design in Light Metals

4:50 PM

Efficient Use of Titanium, Boron and Strontium in Grain Refining and Modification of Die-cast A356: *Sebastian Fischer*¹; Roman Boras¹; Andreas Bührig-Polaczek¹; Matthias Bünck²; ¹RWTH Aachen University; ²Access e.V.

5:10 PM

Studying on the Effects of Quenching Rate on Residual Stress in Al-5Mg and Al-Mg-Cu Alloys: *Halil Kalkan*¹; Derya Dispinar¹; ¹Istanbul University

Solar Cell Silicon — Silicon Production and Solidification

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Conversion and Storage Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Gabriella Tranell, Norwegian University of Science & Technology; Yulia Meteleva-Fischer, Materials Innovation Institute M2i; Arjan Ciftja, SINTEF; Shadia Ikhmayies, Al Isra University

Wednesday PM Room: Balboa
February 19, 2014 Location: San Diego Marriott Marquis & Marina

Session Chairs: Gabriella Tranell, Norwegian University of Science & Technology; Arjan Ciftja, SINTEF

2:00 PM Introductory Comments

2:10 PM

Electrochemical Deposition of High Purity Silicon from Molten Fluoride Electrolytes: *Geir Martin Haarberg*¹; Henrik Gudbrandsen²; Karen Osen²; Sverre Rolseth²; Ana Maria Martinez²; ¹Norwegian University of Science and Technology; ²SINTEF Materials and Chemistry

2:30 PM

Investigation on the Electrochemical Reduction Behavior of Granular SiO₂ in Molten CaCl₂: *Xiao Yang*¹; Kouji Yasuda¹; Toshiyuki Nohira¹; Rika Hagiwara¹; Koki Ichitsubo²; Kenta Masuda²; Takayuki Homma³; ¹Kyoto University; ²Taiheiyō Cement Corporation; ³Waseda University

2:50 PM

Determination of Cell Potential for Silicon Electrodeposition: *Samira Sokhanvaran*¹; Mansoor Barati¹; ¹University of Toronto

3:10 PM

Preparation of Solar Grade Silicon Precursor by Electrolysis SiO₂ in Molten Salts: Liangxing Li¹; *Zhongning Shi*¹; Aimin Liu¹; Bingliang Gao¹; Zhaowen Wang¹; Xianwei Hu¹; Jiangyu Yu¹; ¹Northeastern University

3:30 PM Break

3:50 PM

Metallurgical Silicon Refining by Transient Directional Solidification: *Moysés Lima*¹; Marcelo Martorano²; João Batista Neto¹; ¹Institute for Technological Research of the São Paulo State - IPT; ²University of São Paulo

4:10 PM

New Applications of Sheet Casting of Silicon and Silicon Composites: *Bert Kraaijveld*¹; Pierre-Yves Pichon¹; Axel Schonecker¹; Yulia Meteleva-Fischer²; ¹RGS Development; ²Materials Innovation Institute M2i

4:30 PM

Gas Phase Interactions as Sources of Contamination in Solar Silicon: *Yulia Meteleva-Fischer*¹; Amarante Böttger²; Wim Sloof²; Bert Kraaijveld³; ¹Materials innovation institute (M2i); ²Delft University of Technology; ³RGS Development B.V.

4:50 PM

Tracing Impurities in Silicon Production in the Microwave Furnace: *Jan-Philipp Mai*¹; Gabriele Raabe²; ¹JPM Silicon GmbH; ²University of Braunschweig, Institute of Technology, IfT

5:10 PM

Synthesis of SiC by Direct Reduction of SiO₂ by Using a Methane Gas-Experimental Approach: *Michal Ksiazek*¹; Halvor Dalaker²; Eli Ringdalen²; Merete Tangstad¹; ¹NTNU Norwegian University of Science and Technology; ²SINTEF



Solid-state Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment — Interface Morphology and Stability

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Xiang-Yang Liu, Los Alamos National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Stephen Foiles, Sandia National Laboratories; Mitra Taheri, Drexel University; Rampi Ramprasad, University of Connecticut

Wednesday PM
 February 19, 2014

Room: 4
 Location: San Diego Convention Center

Session Chair: Mitra Taheri, Drexel University

2:00 PM Invited

A Continuous Method for the Calculation of the Reduction in Interfacial Gibbs Free Energy Due to Interfacial Segregation: *David Seidman*¹; Ivan Blum¹; Sung-Il Baik¹; Mercuri Kanatzidis¹; ¹Northwestern University

2:40 PM

Trans-Interface-Diffusion-Controlled Coarsening of Precipitates in Ternary Alloys: *Alan Ardell*¹; ¹University of California

3:00 PM

Interfacial Reactions and Phase Growth for Various Metal/Amorphous Si System: *Zoltán Balogh*¹; Alexander Fuhrich¹; Mohammed Ibrahim¹; Bence Parditka²; Ralf Schlesiger¹; Patrick Stender²; Zoltán Erdélyi²; Guido Schmitz¹; ¹University of Münster; ²University of Debrecen

3:20 PM

Interfacial Segregation in MoSi₂-Based Duplex Alloys: A Phase-field Study Combined with First-principles Calculation: *Toshihiro Yamazaki*¹; Yuichiro Koizumi¹; Akihiko Chiba¹; Koji Hagihara²; Takayoshi Nakano²; Koretaka Yuge³; Kyosuke Kishida³; Haruyuki Inui³; ¹Tohoku University; ²Osaka University; ³Kyoto University

3:40 PM Break

3:50 PM Invited

Periodic Segregation of Solute Atoms in Fully Coherent Twin Boundaries in Mg Alloys: *Jian-Feng Nie*¹; Yuman Zhu¹; Zhe Liu¹; Xi-Ya Fang¹; ¹Monash University

4:30 PM

The Effects of Solutes on Thermal Stability of Nanotwins: *Valery Borovikov*¹; Mikhail Mendelev¹; ¹The Ames Laboratory

4:50 PM

Effect of Vacancy Ordering and Order-disorder Transitions on Ionic Diffusivity in Iron-sulfide Passive Corrosion Films: *Aravind Krishnamoorthy*¹; Bilge Yildiz¹; ¹Massachusetts Institute of Technology

5:10 PM

Cation Diffusion and Surface Reactivity in Iron Sulfide Fe1-xS: *William Herbert*¹; Aravind Krishnamoorthy¹; Bal Mukund Dhar¹; Krystyn Van Vliet¹; Bilge Yildiz¹; ¹MIT

Symposium on High Entropy Alloys II — Modeling and Mechanical Properties

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Alloy Phases Committee
Program Organizers: Peter Liaw, The University of Tennessee; Gongyao Wang, University of Tennessee; M. C. Gao, National Energy Technology Laboratory; S. N. Mathaudhu

Wednesday PM
 February 19, 2014

Room: 5A
 Location: San Diego Convention Center

Session Chairs: Michael Gao, National Energy Technology Lab; Michael Widom, Carnegie Mellon University

2:00 PM Invited

Prediction of Low Temperature Phase Transitions in the High Entropy Alloy Mo-Nb-Ta-W: *Michael Widom*¹; ¹Carnegie Mellon University

2:20 PM

Ab Initio Study of FeMnNiCoCr High Entropy Alloys: *Blazej Grabowski*¹; Duancheng Ma¹; Jörg Neugebauer¹; ¹Max-Planck-Institut für Eisenforschung

2:30 PM Invited

Low Stacking Fault Energy High Entropy Alloys: Alexander Zaddach¹; Changning Niu¹; James LeBeau¹; Carl Koch¹; *Douglas Irving*¹; ¹North Carolina State University

2:50 PM

Equal Channel Angular Extrusion Consolidation of Lightweight High Entropy Alloys: Laszlo Kecskes¹; *Mark Atwater*²; Vincent Hammond¹; Kristopher Darling¹; ¹US Army Research Laboratory; ²Millersville University

3:00 PM Invited

An Understanding of High Entropy Alloy from Phase Diagram Calculation: *Fan Zhang*¹; Chuan Zhang¹; Shuanglin Chen¹; Weisheng Cao¹; Jun Zhu¹; Ursula Kattner²; ¹CompuTherm, LLC; ²NIST

3:20 PM

Aluminum Alloying Effects on Lattice Types, Microstructures, and Mechanical Behavior of High-entropy Alloys Systems: *Zhi Tang*¹; Michael Gao²; Haoyan Diao¹; Tengfei Yang¹; Junpeng Liu³; Tingting Zuo³; Yong Zhang³; Zhaoping Lu³; Yongqiang Cheng⁴; Yanwen Zhang¹; Karin Dahmen⁵; Peter Liaw¹; Takeshi Egami¹; ¹The University of Tennessee; ²National Energy Technology Laboratory; ³University of Science and Technology Beijing; ⁴Oak Ridge National Laboratory; ⁵University of Illinois at Urbana-Champaign

3:30 PM Break

3:50 PM

First Principles Simulation of a NiFeCrCoMn High Entropy Alloy: *Changning Niu*¹; Alexander Zaddach¹; Carl Koch¹; Douglas Irving¹; ¹North Carolina State University

4:00 PM Invited

Characterization of Multicomponent Alloys Developed by Equiatomic Substitution: *Ki Buem Kim*¹; ¹Sejong University

4:20 PM Invited

Ab Initio Modeling of High Entropy Alloys Using Special Quasirandom Structures: *Chao Jiang*¹; Michael Gao²; ¹University of Wisconsin; ²National Energy Technology Laboratory

4:40 PM Invited

Phase Evolution in High Entropy Alloys during Mechanical Alloying and Spark Plasma Sintering: S. Praveen¹; Mayur Vaidya¹; *Ravi Sankar Kottada*¹; Srinivasa Murty Budaraju¹; ¹IIT Madras

Ultrafine Grained Materials VIII — High Pressure Torsion Studies

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Laverna, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Wednesday PM
February 19, 2014

Room: 6F
Location: San Diego Convention Center

Session Chairs: Kaveh Edalati, Kyushu University; Hyoung Seop Kim, POSTECH

2:00 PM Invited

Development of Microstructural and Hardness Homogeneity in Metals Processed by High-pressure Torsion: *Megumi Kawasaki*¹; Roberto Figueiredo²; Terence Langdon³; ¹Hanyang University; ²Universidade Federal de Minas Gerais; ³University of Southern California

2:20 PM Invited

Mg Clustering Induced by Severe Plastic Deformation in an Al-Mg Alloy: *Xavier Sauvage*¹; Nariman Enikeev²; Maxim Murashkin²; Ruslan Valiev²; ¹University of Rouen, CNRS; ²IPAM-USATU

2:40 PM

Mechanical Properties and Microstructure Evolution of an Aluminum 6082 Alloy Processed by HPT: *Ehab El-Danaf*¹; Megumi Kawasaki²; Magdy El-Rayes³; Muneer Baig¹; Terence Langdon³; ¹King Saud University; ²Hanyang University; ³University of Southern California

2:55 PM

Application of High-pressure Torsion to Al-6%Cu-0.4%Zr for Ultrafine-grain Refinement and Superplasticity: *Ali Alhamidi*¹; Zenji Horita¹; ¹Kyushu University

3:10 PM

Nanostructure Control of Age-hardenable Al-Cu Alloy by Processing High-pressure Torsion for Extra High Strength: *Intan Fadhlina Mohamed*¹; Yosuke Yonenaga¹; Seungwon Lee¹; Zenji Horita¹; ¹Kyushu University

3:25 PM

An Examination of the Flow Patterns Developed on Disc Lower Surfaces under Different Anvil Misalignments in High-pressure Torsion: *Yi Huang*¹; Ahmed Al-Zubaydi¹; Terence Langdon¹; ¹University of Southampton

3:40 PM Break

3:55 PM

Precipitation Phenomena in HPT Processed 7475 Aluminium Alloy: Kinga Wawer¹; Daria Setman²; Erhard Schafner²; *Malgorzata Lewandowska*¹; Michael Zehetbauer²; ¹Warsaw University of Technology; ²University of Vienna

4:10 PM

Structure and Properties of the Mg-Y-Gd-Zr Alloy after High Pressure Torsion: *Sergey Dobatkin*¹; Lazar Rokhlin¹; Maksim Murashkin²; Tatiana Dobatkina¹; Elena Lukyanova¹; ¹A.A. Baikov Institute of Metallurgy and Materials Science, Russian Academy of Sciences; ²Ufa State Aviation Technical University

4:25 PM

Grain Refinement and Mechanical Properties of Mg-3.4at%Zn Alloy Strained by High-pressure Torsion: Fanqiang Meng¹; *Julian Rosalie*¹; Alok Singh¹; Hidetoshi Somekawa¹; Koichi Tsuchiya¹; ¹National Institute for Materials Science

4:40 PM

Microstructure Evolution and Mechanical Properties of Ti₁₃Mo Alloy Processed by High Pressure Torsion: *Miloš Janček*¹; Jakub Cížek¹; Josef Stráský¹; Kristína Václavová¹; Veronika Polyakova²; Irina Semenova²; ¹Charles University; ²Ufa State Aviation Technical University

4:55 PM

Graphite to Diamond Phase Transformation by High-pressure Torsion: *Kaveh Edalati*¹; Takeshi Daio¹; Yoshifumi Ikoma¹; Makoto Arita¹; Zenji Horita¹; ¹Kyushu University

5:10 PM

Fabrication of L10-Ordered FeNi Using High-pressure Torsion and Annealing: *Seungwon Lee*¹; Kaveh Edalati¹; Hideaki Iwaoka¹; Zenji Horita¹; Takumi Ohtsuki²; Takuo Ohkoshi³; Masato Kotsugi³; Takayuki Kojima⁴; Masaki Mizuguchi⁴; Koki Takanashi⁴; ¹Kyushu University; ²Japan Synchrotron Radiation Research Institute; ³Japan Synchrotron Radiation Research Institute; ⁴Tohoku University

5:25 PM

Low Temperature Long Term Annealing of Copper Subjected to High-pressure Torsion: *Alexander Zhilyaev*¹; Terence Langdon¹; ¹University of Southampton

Ultrafine Grained Materials VIII — Powder Processing of Nanomaterials

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Laverna, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Wednesday PM
February 19, 2014

Room: 6E
Location: San Diego Convention Center

Session Chairs: Dmitry Orlov, Ritsumeikan University; Troy Topping, University of California, Davis

2:00 PM Invited

Expanding Solid-state Foaming: Intraparticle Expansion as a Means to Enhance Porosity in Metals: Mark Atwater¹; Kris Darling²; *Mark Tschopp*²; ¹Millersville University; ²Army Research Laboratory

2:20 PM

Fabrication of Bulk Ultra-fine Grained Magnesium Alloy via Additive Friction Stir Deposition: *Kumar Kandasamy*¹; Jacob Calvert¹; Liam Renaghan¹; Kevin Creehan¹; Jeffrey Schultz¹; ¹Aeroprobe Corporation

2:35 PM

Mechanical and Acoustic Properties of UFG Magnesium: *Zuzanka Trojanova*¹; Pavel Lukác¹; ¹Charles University

2:50 PM

Harmonic-structured Materials: Proof of Fabrication Concept Based on Severe Plastic Deformation of Powders: *Dmitry Orlov*¹; Shota Kato¹; Choncharoen Sawangrat¹; Alexei Vinogradov²; Kei Ameyama¹; ¹Ritsumeikan University; ²Togliatti State University

3:05 PM

Microstructure and Mechanical Properties of Bulk Ultrafine Structured Alloys and Metal Matrix Composites Alloys Synthesized by a Combination of High Energy Mechanical Milling and Thermomechanical Powder Consolidation: *Deliang Zhang*¹; Jiamiao Liang¹; Dengshan Zhou²; Xun Yao¹; Yifeng Zheng¹; ¹Shanghai Jiao Tong University; ²The University of Waikato

3:20 PM

Thermomechanical Processing of a Cryomilled Al-Mg Alloy: Khan Kaiser¹; Clara Hofmeister; Anit Giri²; Yongho Sohn³; Mark van den Bergh⁴; Kyu Cho²; *Bhaskar Majumdar*¹; ¹New Mexico Tech; ²WMRD; ³University of Central Florida; ⁴DWA Aluminum Composites

3:35 PM Break

3:50 PM Invited

Processing of Nanocrystalline Ceramics for Optical Applications: E Penilla¹; A Wieg¹; C Hardin¹; *J. Garay*¹; ¹University of California Riverside



4:10 PM

Linear and Non-linear Optical Properties of Functional Transparent Oxide Ceramics via Current Activated Pressure Assisted Densification (CAPAD) and Femtosecond Laser Processing: *Elias Penilla*¹; Pablo Martinez-Torres¹; Yasuhiro Kodera¹; Javier Garay¹; ¹University of California Riverside

4:25 PM

CAPAD Processing of Nanostructured Rare Earth Doped Zirconia for High Temperature Light Emission Applications: *Corey Hardin*¹; Yasuhiro Kodera¹; Sergey Basun²; Dean Evans²; Javier Garay¹; ¹University of California Riverside; ²Air Force Research Laboratory

4:40 PM

Microstructure and Mechanical Properties of Ultrafine Grained Ferritic Steels Processed by Spark Plasma Sintering and Hot Isostatic Pressing: A Comparative Study: *Xavier Boulnat*¹; Damien Fabrègue²; Michel Perez²; Jean-Luc Flament¹; Pierre Wident¹; Yann de Carlan¹; ¹CEA, DEN; ²INSA Lyon - MATEIS

4:55 PM

Influence of Sc and Zr Additions on the Microstructure and Mechanical Properties of UFG Al-Mg Alloys: *Troy Topping*¹; Tammy Harrell¹; Tao Hu¹; Haiming Wen¹; Julie Schoenung¹; Enrique Lavernia¹; ¹University of California, Davis

5:10 PM

Ultrafine-grained Aluminum Nanocomposites with Hierarchically Tailored Distribution of Boron Carbide Nanoparticles: *Lin Jiang*¹; Troy Topping¹; Hanry Yang¹; Enrique Lavernia¹; Julie Schoenung¹; ¹University of California Davis

5:25 PM

Influence of Grain Boundary Misorientation Angle on Tensile Ductility of Ultrafine-grained Al Alloy: *Tao Hu*¹; Kaka Ma¹; Troy Topping¹; Brandon Saller¹; Ali Yousefiani²; Julie Schoenung¹; Enrique Lavernia¹; ¹University of California, Davis; ²Boeing Company

2014 Functional Nanomaterials: Synthesis, Properties and Applications — Applications of Nanomaterials I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Nanomaterials Committee

Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Thursday AM
February 20, 2014

Room: Ballroom D
Location: San Diego Marriott Marquis & Marina

Session Chairs: Nitin Chopra, The University of Alabama; Aswhin Ramasubramaniam, University of Massachusetts Amherst; Jiyoung Kim, The University of Texas at Dallas

8:30 AM Keynote

Piezotronics and Piezo-phototronics: *Zhong Wang*¹; ¹Georgia Institute of Technology

9:10 AM

Three-dimensional ZnO Nanoforest: Morphological Evolution and Electrochemical Energy Storage Application: *Yuanbing Mao*¹; Xing Sun¹; Qiang Li¹; ¹University of Texas-Pan American

9:30 AM

ZnO Nanorods as Antireflective Coatings for Single Crystalline Silicon Solar Cells: *Pantea Aurang*¹; Olgu Demircioglu¹; Firat Es¹; Rasit Turan¹; *Husnu Unalan*¹; ¹Middle East Technical University

9:50 AM

TiO₂ Nanotubes Filled with NiFe₂O₄ Quantum Dots and Ni-Fe Nanoalloy: Synthesis and Applications: *M. Yousef Mohassab-Ahmed*¹; Ahmed Moustafa²; Hong Yong Sohn³; Ahmed Farghali⁴; Mohamed Khedr⁴; ¹University of Utah ;

²Beni-Suef University ; ³University of Utah; ⁴Beni-Suef University

10:10 AM Break

10:30 AM

Ultra-long and Noble Copper Nanowires Tailored by Various Structure Directing Agents in Solution Process: *Jahyun Koo*¹; Na Rae Kim¹; Yung Jong Lee¹; *Hyuck Mo Lee*¹; ¹KAIST

10:50 AM

Fabrication and Characterization of Metallo-dielectric Photonic Crystals with Plasmonic Response: *Victoria Chernow*¹; Julia Greer¹; ¹California Institute of Technology

11:10 AM Invited

Graphene Coating-enabled Surface Plasmon Coupled Emission and Optical Diode Action: *Apparao Rao*¹; ¹Clemson University

11:40 AM

Optical and Magnetical Properties of FeCr₂O₄ Nanopigments with Spinel Type Structure: *Oscar Restrepo*¹; Juan Montoya²; Edgar Chavarriaga¹; ¹National University of Colombia; ²Corporación Universitaria Lasallista.

11:55 AM

Photocatalytic Properties of TiO₂ Nanoparticle/Titanate Nanotube Composite in UV-visible Light Range: *Se-Hoon Kim*¹; Tohru Sekino²; Shun-ichiro Tanaka²; ¹KATECH; ²Tohoku University

2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications — Nanomaterials for Energy Applications and Carbon Related Materials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Thin Films and Interfaces Committee

Program Organizers: Nugehalli Ravindra, New Jersey Institute of Technology; Ramki Kalyanaraman, University of Tennessee; Haiyan Wang, Texas A&M University; Yuntian Zhu, North Carolina State University; Justin Schwartz, North Carolina State University; Amit Goyal, Oak Ridge National Laboratories

Thursday AM
February 20, 2014

Room: Ballroom E
Location: San Diego Marriott Marquis & Marina

Session Chairs: Nitin Chopra, University of Alabama; Ashutosh Tiwari, University of Utah

8:30 AM Invited

Charged Defect-induced Preferential Scattering for Enhanced Thermoelectric Performance in Few-layered n-Bi₂Te₃: *Apparao Rao*¹; ¹Clemson University

8:50 AM Invited

Laser Ablation in Liquids: A Unique Route to Fabricate Hollow Micro/Nanoparticles from Bulk Materials: *Douglas Chrisey*¹; ¹Tulane University

9:10 AM Invited

A New Class of Molecularly-tailored Nanomaterials and Interfaces For Energy Conversion and Thermal Management: *Ganpati Ramanath*¹; ¹Rensselaer Polytechnic Institute

9:30 AM Invited

Atomistic Study of Thermoelectric, Electronic and Optical Properties of Suspended Graphene Nanosheet and Nanoribbons: *Sarang Muley*¹; Ravindra Nugehalli¹; ¹New Jersey Institute of Technology

9:50 AM Break

10:10 AM Invited

Does Function Follow Form? The Role and Utility of Geometry in Carbon Nanotubes: *Prabhakar Bandaru*¹; ¹UC, San Diego

10:30 AM Invited

Improved Interlaminar/Interfacial Fracture Toughness through Polymer Nano-particle Thin Film/Spray Mediated Composites: *Ranji Vaidyanathan*¹; Krishna Bastola¹; ¹Oklahoma State University

10:50 AM Invited

Gold Nanoparticle Inside Graphene Shells: Prospects in Sensors and Plasmonics: *Nitin Chopra*¹; ¹The University of Alabama

11:10 AM

Carbon Nanotube Coated Conductor Composites: *Terry Holesinger*¹; Raymond Depaula¹; John Rowley¹; Pallas Papin¹; ¹Los Alamos National Laboratory

11:30 AM

Optical, Electrical and Electronic Properties of Vanadium Oxides – An Analysis: *Chiranjivi Lamsal*¹; Nuggehalli Ravindra¹; ¹New Jersey Institute of Technology

11:50 AM

Encapsulating Polymeric Nitrogen in Carbon Nanotubes: *El Mostafa Benchafia*¹; Zafar Iqbal¹; Nuggehalli Ravindra¹; ¹New Jersey Institute of Technology

12:10 PM Invited

Magnetic Spinel Ferrite Thin Films and Nanostructures: *Arunava Gupta*¹; ¹University of Alabama

5th International Symposium on High Temperature Metallurgical Processing — Treatment 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; Mark Schlesinger, Missouri University of Science and Technology; Onuralp Yücel, ITU; Rafael Padilla, University of Concepcion; Phillip Mackey, P.J. Mackey Technology; Guifeng Zhou, Wuhan Iron and Steel

Thursday AM

February 20, 2014

Room: 18

Location: San Diego Convention Center

Session Chairs: Rafael Padilla, University of Concepcion; Hongxu Li, University of Science and Technology Beijing

8:30 AM Introductory Comments

8:35 AM

A Pilot-plant Scale Test on DRI Preparation from High-alumina Limonite Ore by Coal-based Rotary Kiln Direct Reduction Process: *Guanghui Li*¹; Changgen Wang¹; Mingjun Rao¹; Yuanbo Zhang¹; Tao Jiang¹; ¹School of Minerals Processing and Bioengineering, Central South University

8:50 AM Invited

The Effect of Various Ration of Citric and Sulfuric Acid on the Structure and Leaching Properties of Pellets of Laterite Roasted at High Temperature: *Hongxu Li*¹; ¹University of Science and Technology

9:05 AM

Improving the Beneficiation of Low-grade Saprolitic Nickel Laterite by Reduction Roasting in the Presence of Additives: *Deqing Zhu*¹; Guolin Zheng¹; Jian Pan¹; Qihou Li¹; Yueming An²; Jinghe Zhu²; ¹Central South University; ²China Nonferrous Metal Mining Group Co. Ltd

9:20 AM Invited

Recycling of Steelworks Waste Using the Direct Reduction Process: *Nikolay Panishev*¹; Victor Rashnikov¹; Boris Dubrovsky¹; Eugene Redin¹; Edward Knyazev¹; ¹Magnitogorsk Iron & Steel Works

9:35 AM

Research on Bottom-blowing Smelting Processing Lead Sulfate Secondary Material: *Weifeng Li*¹; Chuanfu Zhang¹; Lihua Jiang¹; *Jing Zhan*¹; ¹Central South University

9:50 AM

Preparation of Synthetic Rutile from Titanium Slag: *YuFeng Guo*¹; *Jing He*¹; Tao Jiang¹; ShuiShi Liu¹; FuQiang Zheng¹; Shuai Wang¹; ¹Central South University

10:05 AM Break

10:15 AM

Characterization of Magnetic Roasting and Magnetic Separation of a High-alumina-content Limonite Ore: *Tao Jiang*¹; Xin Zhang¹; Mingjun Rao¹; Jinghua Zeng¹; Yuanbo Zhang¹; *Guanghui Li*¹; ¹School of Minerals Processing and Bioengineering, Central South University

10:30 AM

Separation of Oolitic Hematite from Iron-rich Chlorite with Reduction Roasting Technique Followed by Magnetic Separation: *Wen Chen*¹; ¹Changsha Research Institute Of Mining And Metallurgy

10:45 AM

The Research of Metallurgical Reaction

Engineering in Oxygen Bottom Blowing Copper Smelting Process: *Shen Dianbang*¹; Cui Zhixiang¹; Yan Hongjie¹; Yu Pengfei¹; Cui Zhiqiang¹; ¹Dongying Fangyuan Nonferrous Metals Co. Ltd

11:00 AM Invited

The Study of Recycling Ni/Fe from Laterite by Coal Pre-reduction and Magnetic Separation: *Hongxu Li*¹; ¹University of Science and Technology

11:15 AM

The Phase Transformation of Laterite Ore Treated with Insufficient Reductant: *Yaojie Wang*¹; Yanling Guo¹; Tao Zeng¹; Jieyu Zhang¹; Bingyi Bai¹; Guoding Gao¹; ¹Shanghai University

11:30 AM

Adsorptive Removal of Phosphate Anions from Municipal Wastewater Using Raw and Wasted Low Grade Iron Ore with High Phosphorus Adsorbent: *Xiaoli Yuan*¹; ¹Chongqing University of Science and Technology

A Lifetime of Experience with Titanium Alloys: An SMD Symposium in Honor of Jim Williams, Mike Loretto and Rod Boyer — General Abstracts

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

Program Organizers: Adam Pilchak, Air Force Research Laboratory; James Larsen, Air Force Research Laboratory; David Dye, Imperial College London; Jay Tiley, Air Force Research Laboratory

Thursday AM

February 20, 2014

Room: 1A

Location: San Diego Convention Center

Session Chair: Adam Pilchak, Air Force Research Laboratory

8:30 AM

An Examination of the Thermally Related Factors Influencing the Melting/Dissolution of Solids in Liquid Titanium.: *Jun Ou*¹; Steve Cockcroft¹; Daan Maijer¹; Lu Yao¹; Carl Reilly¹; Ainul Akhtar¹; ¹The University of British Columbia

8:50 AM

Application of a Combinatorial Approach to Explore the Influence of Composition on Metastable and Equilibrium Microstructures in Eutectoid Binary Titanium Alloys: *David Brice*¹; Alyn Gray¹; Chandana Avasarala¹; *Peter Collins*¹; ¹University of North Texas

9:10 AM

On the Microstructure and Properties of the Ti-3Al-2.5V Alloy Obtained by Powder Metallurgy: *Leandro Bolzoni*¹; Elisa Maria Ruiz-Navas²; Elena Gordo²; ¹Brunel University; ²Universidad Carlos III de Madrid

9:30 AM

Orientation-sensitive Dislocation-twin Boundary Interaction and Its Influence on Crack Initiation in a-Titanium via Atom-istic Simulations: *Hao Wang*¹; Dongsheng Xu¹; David Rugg²; Aijun Huang³; Rui Yang¹; ¹Institute of Metal Research, Chinese Academy of Sciences; ²Rolls-Royce PLC; ³Baosteel Co. Ltd.



9:50 AM

Superior Tensile Strength and Ductility in Ti-6Al-4V Recycled from Machining Chips by Severe Plastic Deformation: Edward Lui¹; Daniel McDonald¹; Suresh Palanisamy²; Matthew Dargusch³; *Kenong Xia*¹; ¹University of Melbourne; ²Swinburne University; ³University of Queensland

10:10 AM Break

10:25 AM

Mechanical Properties of Biomedical Beta-type Titanium Alloy with Yttrium Oxide Particles Formed by Yttrium Addition: *Junko Hieda*¹; Mitsuo Niinomi¹; Masaaki Nakai¹; Ken Cho¹; ¹Institute for Materials Research, Tohoku University

10:45 AM

Phase Transformations and Grain Refinement during Hydrogen Sintering of Ti-6Al-4V Alloy: *Pei Sun*¹; Zak Fang¹; Mark Koopman¹; James Paramore¹; Lu Yang¹; ¹The University of Utah

11:05 AM

Effects of Rare Earth Er₂O₃ on Microstructure and Mechanical Properties of Titanium Foams by Powder Metallurgy: *Xiao Jian*¹; Qiu Guibao¹; Liao Yilong¹; ¹Chongqing University

11:25 AM

Tensile Deformation Micro Mechanisms for Ti-based Metallic-glass-matrix Composites: Haoling Jia¹; Junwei Qiao²; An-Cheng Sun³; E-Wen Huang⁴; Yong Zhang⁵; ChihPin Chuang⁶; Yanfei Gao⁷; *Peter Liaw*⁶; ¹University of Tennessee; ²Taiyuan University of Technology; ³Yuan Ze University; ⁴National Central University; ⁵University of Science and Technology Beijing; ⁶The University of Tennessee; ⁷The University of Tennessee & Oak Ridge National Laboratory

Advanced Materials for Power Electronics, Power Conditioning, and Power Conversion II — High Performance Soft Magnets II (This is a joint session with Magnetic Materials for Energy Applications IV)

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee, TMS: Magnetic Materials Committee
Program Organizers: Paul Ohodnicki, National Energy Technology Laboratory; Michael McHenry, Carnegie Mellon University; Matthew Willard, Case Western Reserve University; Rachael Myers-Ward, NRL; Mike Lanagan, Penn State University; Clive Randall, Penn State University

Thursday AM
February 20, 2014

Room: Ballroom G
Location: San Diego Marriott Marquis & Marina

Session Chairs: Paul Ohodnicki, National Energy Technology Laboratory; Ivan Skorvanek, Institute of Experimental Physics

8:30 AM Joint Session with Magnetic Materials for Energy Applications. A joint session with the Magnetic Materials for Energy Applications symposium is planned. This session will be held in Ballroom G of the Marriott. For complete session details, turn to the Magnetic Materials for Energy Applications entry in the program book or online.

8:30 AM Invited: Analysis of Soft Magnetic Materials for Energy Applications: presented by Samuel Kernion, Carpenter Technology Corporation

9:00 AM Fe-rich FeSiBPCu Nano-crystalline Soft Magnetic Alloys Contributable To Energy-saving: presented by Akihiro Makino, Tohoku University

9:20 AM CoNiFe Alloy Powder Synthesis by High Energy Milling: presented by Jesus Calata, Virginia Tech

9:40 AM Invited Novel Morphology of Highly Efficient Two-phase Ferrite Cores for Power Systems: presented by Vincent Harris, Northeastern University

10:10 AM Break

10:25 AM Invited: The Use of Pressure and Strain as Processing Variables in Soft Magnetic Nanocomposite Materials: presented by Alex Leary, Carnegie Mellon University

10:55 AM: Application of Small Angle Scattering to FeCo-based Soft Magnetic Nanocomposites: presented by Paul Ohodnicki, National Energy Technology Laboratory

11:15 AM: Fabrication of Nanocrystalline Magnetic Materials for Use in Energy-efficient Distribution Transformers: presented by Naoki Ito, Motoki Ohta, Metglas Inc.

11:35 AM Student: Thin Ferrite Films Compared to Oxide Coated Iron Powder for Electromagnetic Devices: presented by Katie Jo Sunday, Drexel University

Advanced Materials in Dental and Orthopedic Applications — Bone/Dental Implants with Enhanced Biomedical Performance

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Hanson Fong, University of Washington; Mathew Mathew, Rush University Medical Center; Cortino Sukotjo, University of Illinois at Chicago

Thursday AM
February 20, 2014

Room: 32B
Location: San Diego Convention Center

Session Chairs: Cortino Sukotjo, University of Illinois at Chicago; Tolou Shokuhfar, Michigan Tech

8:30 AM Invited

Photofunctionalization: The New Generation Implant Therapy: *Takahiro Ogawa*¹; ¹UCLA School of Dentistry

9:00 AM Invited

Electrical Stimulation of Titanium for Eradication of Bacterial Biofilms: *Mark Ehrensberger*¹; Menachem Tobias¹; Lisa Hufnagel¹; Nicole Luke¹; Scott Nodzo¹; Anthony Campagnari¹; ¹University at Buffalo

9:30 AM

Frontiers for Bulk Nanostructured Metals in Biomedical Applications: *Terry Lowe*¹; Ruslan Valiev¹; ¹Figure Eight LLC

9:50 AM

Cytocompatibility Assessment of Magnesium-based Alloys: Christopher Smith¹; *Zhigang Xu*¹; Jenora Waterman¹; ¹North Carolina State University

10:05 AM Break

10:25 AM Invited

Titania Nanotube Arrays Modulate in Vitro Hemocompatibility and Immune Response: *Ketul Popat*¹; ¹Colorado State University

10:55 AM Invited

Salivary Protein Adsorption on Microstructured Titanium Surfaces: Effect in Biofilm Formation: *Argelia Almaguer-Flores*¹; Sandra Rodil²; ¹Universidad Nacional Autónoma de México, Facultad de Odontología; ²Universidad Nacional Autónoma de México, Instituto de Investigaciones en Materiales

11:25 AM

Optimization of Anodization and Annealing Condition Enhances TiO₂ Nanotubular Surface Hydrophilicity: *Azhang Hamlekhan*¹; Arman Butt²; Sweetu Patel²; Dmitry Royhman³; Christos Takoudis²; Cortino Sukotjo³; Mathew Mathew⁴; Tolou Shokuhfar⁵; ¹Michigan Tech; ²Department of Bioengineering, University of Illinois at Chicago; ³Department of Restorative Dentistry, College of Dentistry, University of Illinois at Chicago; ⁴Rush University Medical Center; ⁵Mechanical Engineering—Engineering Mechanics, Michigan Technological University

11:40 AM

Novel Technique for Hydroxyapatite Deposition with High Crystallinity on Pure Titanium via Plasma Electrolytic Oxidation: Ki Ryong Shin¹; Kang Min Lee¹; Sang Il Yoon¹; Young Gun Ko²; Dong Hyuk Shin¹; ¹Hanyang University; ²Yeungnam University

Alloys and Compounds for Thermoelectric and Solar Cell Applications II — Alloys and Compounds for Thermoelectric and Solar Cell Applications: Thermoelectric III

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Sinn-wen Chen, National Tsing Hua University; Yoshisato Kimura, Tokyo Institute of Technology; Chih-Huang Lai, National Tsing Hua University; Ce-Wen Nan, Tsinghua University; G. Jeffrey Snyder, California Institute of Technology; Hubert Scherrer, Ecole des Mines; Hsin-jay Wu, National Tsing Hua University

Thursday AM
February 20, 2014

Room: Cardiff
Location: San Diego Marriott Marquis & Marina

Session Chairs: Sinn-wen Chen, National Tsing Hua University; Albert Wu, National Central University

8:30 AM Invited

Progress on the Development of High-temperature, High-efficiency Thermoelectric Converters for Space Applications: *Thierry Caillat*¹; ¹NASA Jet Propulsion Laboratory

8:55 AM Invited

Nanostructuring of Thermoelectric Materials via a Nonequilibrium Intermediate State: *Teruyuki Ikeda*¹; G. Jeffrey Snyder²; ¹Ibaraki University; ²California Institute of Technology

9:20 AM Invited

Development of Heusler-type Fe₂VAl Alloys for Thermoelectric Power Generation: *Masashi Mikami*¹; Yoichi Nishino²; ¹National Institute of Advanced Industrial Science and Technology; ²Nagoya Institute of Technology

9:45 AM

Influences of Thermal Processing on Phase Structure and Compositions in a Mg₄₄Si₁₅Sn₁₁ Alloy: *Qingfeng Xing*¹; Trevor Riedemann¹; Thomas Lograsso¹; ¹Ames Laboratory

10:05 AM Break

10:15 AM

Phase Diagram of Ga-Co-Sb and In-Co-Ga Systems and Thermoelectric Properties of Ga/In-containing Skutterudites: *Yinglu Tang*¹; Yuting Qiu²; Lili Xi²; Xun Shi²; Wenqing Zhang; Lidong Chen; Yuan-Chun Chien; Su-Ming Tseng³; Sinn-wen Chen³; G. Jeffrey Snyder; ¹California Institute of Technology; ²Chinese Academy of Sciences; ³National Tsing Hua University

10:35 AM Invited

Ag Whisker Growth of Ag-In-Se Alloys and Alternating Layer Formation in the In/Ag₂Se Reaction Couples: *Sinn-wen Chen*¹; Chia-ming Hsu²; Jhe-yu Lin¹; Jui-shen Chang¹; ¹National Tsing Hua University; ²National United University

11:00 AM

Exploration of Surface Electrical Properties of Cu₂ZnSn(S,Se)₄ Thin-films with Conversion Efficiency Higher Than 8%: *Geeyeong Kim*¹; Ahreum Jeong²; Juri Kim¹; William Jo¹; Dae-Ho Son³; Dae-Hwan Kim³; Jin-Kyu Kang³; ¹Ewha Womans University; ²LG Innotek; ³Green Energy Research Division, Daegu Gyeongbuk Institute of Science and Technology

11:20 AM

Investigation of Electrical Properties of CIGS Thin-films Derived by Sol-gel Process: *Nilgun Baydogan*¹; Utku Canci¹; Sengul Akyol¹; Huseyin Cimenoglu¹; ¹Istanbul Technical University

11:40 AM

The Influence of Thickness on the Optical Parameters of Thermally Evaporated CdS Thin Films: *Shadia Ikhmayies*¹; ¹Al Isra University

12:00 PM

Optical Parameters of Thermally Evaporated SnO₂ Thin Films: *Shadia Ikhmayies*¹; ¹Al Isra University

Aluminum Alloys: Development, Characterization and Applications — Emerging Technologies

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Xiyu Wen, University of Kentucky

Thursday AM
February 20, 2014

Room: 12
Location: San Diego Convention Center

Session Chair: Yansheng Liu, Kaiser Aluminum

8:30 AM

Deformation of Open-cell Microcellular Pure Aluminum Investigated by the Acoustic Emission Technique: *Michal Knapek*¹; Patrik Dobron¹; František Chmelík¹; Mariia Zimina¹; Jozef Pešicka¹; Etienne Combaz²; Andreas Mortensen³; ¹Department of Physics of Materials, Faculty of Mathematics and Physics, Charles University; ²Novelis Switzerland SA; ³Ecole Polytechnique Fédérale de Lausanne (EPFL), Laboratory for Mechanical Metallurgy

8:50 AM

The Research on Process of Impact Factors of Hard Anodic Oxidation for 6061 Aluminum Alloy: Jiexiang Wang¹; Zhengfu Zhang¹; *Junsai Sun*¹; Shiguo Huang¹; Yamei Han¹; Jiang Du¹; ¹Kunming University of Science and Technology

9:10 AM

Using Scrap in Recycling Alloys for Structural Applications in the Automotive Industry: *Werner Fagner*¹; Helmut Suppan²; Marc Hummel³; Dominik Bösch⁴; Peter Uggowitzner⁵; ¹AMAG GmbH; ²AMAG Casting GmbH; ³AUDI AG; ⁴Friedrich-Alexander-Universität Erlangen-Nürnberg; ⁵ETH Zürich

9:30 AM

Residual Stress Analysis in Semi-permanent Mold Engine Head Castings: *Mike Walker*¹; Devin Hess¹; Dimitry Sediako²; ¹General Motors Corporation; ²Atomic Energy of Canada Limited

9:50 AM

Tensile and Shear Mechanical Properties in a Thermo-mechanical-electrical Processed Spot Weld: *Scott Turnage*¹; Kiran Solanki¹; Wilburn Whittington²; Radu Florea²; Mark Tschopp³; Kristopher Darling³; ¹Arizona State University; ²Mississippi State University; ³Army Research Laboratory

10:10 AM Break

10:25 AM

Microstructural Characterization and Analysis of Cold Spray Al Alloys: *Baillie McNally*¹; Danielle Belsito¹; Victor Champagne²; Richard Sisson¹; ¹Worcester Polytechnic Institute; ²Army Research Lab

10:45 AM

Development of High-strength and Highly Ductile Hypo-eutectic Al-Si Alloys by Nano-refining the Constituent Phases: *Mohammad Shamsuzzoha*¹; Anwarul Haque¹; Laurentiu Nastac¹; ¹University of Alabama



11:05 AM

Anodization and Optical Appearance of Sputter Deposited Al-Zr Coatings: *Visweswara Gudla*¹; Stela Canulescu¹; Rajashekhara Shabadi²; Kristian Rechendorff³; Jørgen Schou¹; Rajan Ambat¹; ¹Technical University of Denmark; ²Universite Lille1; ³Danish Technological Institute

11:25 AM

Identifying the Driving Forces for Abnormal Grain Growth in Friction Stir Welded and Spin-formed Al-Li 2195: *Wesley Tayon*¹; Marcia Domack¹; Eric Hoffman¹; Stephen Hales¹; ¹NASA Langley Research Center

Biological Materials Science Symposium — Molecular, Cellular and Tissue Engineering

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Po-Yu Chen, National Tsing Hua University; Rajendra Kasinath, Johnson and Johnson Company; Dwayne Arola, University of Washington; Kalpana Katti, North Dakota State University

Thursday AM Room: 33A
February 20, 2014 Location: San Diego Convention Center

Session Chairs: Rajendra Kasinath, Montana Tech of the University of Montana; Michael Porter, University of California, San Diego

8:30 AM Invited

Effects of Graphene on Stem Cell Fate: *Chwee Teck Lim*¹; ¹National University of Singapore

9:00 AM

Drug Releasing Nanoparticles for Odontoblast-like Differentiation of Stem Cells: *Suja Shrestha*¹; Anibal Diogenes²; Anil Kishen¹; ¹University of Toronto; ²University of Texas Health Science Center at San Antonio

9:20 AM

Absorbable Vascular Scaffolding Based on Zinc: *Patrick Bowen*¹; Jaroslav Drellich¹; Jeremy Goldman¹; ¹Michigan Technological University

9:40 AM Invited

Tuning the Mechanical Properties of 3D Hydrogel Scaffolds for In Vitro Cell Culture: *Andrea Jeffery*¹; Kamaldeep Dhami¹; Matthew Churchward¹; Kathryn Todd¹; *Anastasia Elias*¹; ¹University of Alberta

10:10 AM Break

10:30 AM Invited

Adhesive Tissue Repair with Crosslinkable Complex Coacervates: *Russell Stewart*¹; Sarbjit Kaur¹; Ramesha Papanna²; Kenneth Moise²; ¹University of Utah; ²University of Texas Medical School

11:00 AM

Strategies for Understanding Biological Effects of Blast Damage in Respiratory Tissues: Benjamin Butler¹; Thuy-Tien Ngoc²; Chiara Bo²; Richard Curry³; Andrew Jardine¹; William Proud²; Alun Williams¹; *Katherine Brown*¹; ¹University of Cambridge; ²Imperial College London; ³University of Cape Town

11:20 AM

Probing the Interaction of Cells-nanoparticles Using Force-distance (F-d) Spectroscopy: *Anh Ly*¹; Swetha Barkam¹; Soumen Das¹; Sudipta Seal¹; ¹Advanced Materials Processing and Analysis Center, NanoScience Technology Center

11:40 AM Invited

Bio-enabled Self-organization for Hybrid Thin Films: Nur Mustafaoglu¹; Banu Taktak Karaca²; James Meyer³; Mustafa Urgan⁴; *Candan Tamerler*³; ¹University of Notre Dame; ²University of Kansas; Istanbul Technical University; ³University of Kansas; ⁴Istanbul Technical University

Bulk Metallic Glasses XI — Structure and Modeling

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

Program Organizers: Peter Liaw, The University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, The University of Tennessee; Y. Gao, The University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Thursday AM Room: 1B
February 20, 2014 Location: San Diego Convention Center

Session Chairs: Dmitri Louzguine, WPI-AIMR, Tohoku University; Dong Ma, ORNL

8:30 AM Invited

Mechanical Properties and Deformation Behaviour of Bulk Metallic Glassy, Mixed Phase and Nanostructured Alloys: *Dmitri Louzguine*¹; ¹WPI-AIMR, Tohoku University

8:50 AM

Mechanical Properties of In Situ Formed ZrN Particulate Zr-based Bulk Metallic Glass Composites: *Je In Lee*¹; Koichi Tsuchiya²; Eun Soo Park¹; ¹Seoul National University; ²NIMS

9:00 AM Invited

Thermal Expansion and Glass-to-supercooled-liquid Transition in Bulk Metallic Glasses: *Dong Ma*¹; A Stoica¹; X Wang²; H Bei¹; J Neuefeind¹; Y Ren³; ¹ORNL; ²City University of Hong Kong; ³Argonne National Lab

9:20 AM

Nanoglasses: Structure, Stability and Mechanical Properties: *Karsten Albe*¹; ¹TU Darmstadt

9:30 AM Invited

Quantitatively Probing the Mechanical Properties of Metallic Glasses Inside TEM: *Zhiwei Shan*¹; Lin Tian¹; Evan Ma²; ¹Xi'an Jiaotong University; ²Johns Hopkins University

9:50 AM

Enhanced Tensile Ductility of a Zr₆₅Al_{7.5}Ni₁₀Cu_{12.5}Pd₅ Bulk Metallic Glass by High Pressure Torsion and Its Mechanisms of Work Hardenability: *Soo-Hyun Joo*¹; Dong-Hai Pi¹; Albertus Deny Setyawan²; Hidemi Kato²; Milos Janecek³; Sunghak Lee¹; Hyoung Seop Kim¹; ¹POSTECH; ²Tohoku University; ³Charles University

10:00 AM Break

10:20 AM Invited

Probing Structure of BMG with PDF: From Experiment to Interpretation: Wojciech Dmowski¹; *Takuya Iwashita*¹; Takeshi Egami¹; ¹University of Tennessee

10:40 AM

Microstructural Tailoring and Improvement of Mechanical Properties in CuZr-based Bulk Metallic Glass Composites: *Zengqian Liu*¹; Ran Li²; Tao Zhang²; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences; ²Beihang University

10:50 AM Invited

In Situ Neutron Scattering Study of Crystallization Kinetics in Ternary Bulk Metallic Glasses: *Si Lan*¹; Jie Zhou²; Zhaoping Lu²; Mikhail Feyngenson³; Jörg Neuefeind³; Xun-Li Wang¹; ¹City University of Hong Kong; ²University of Science and Technology Beijing; ³Oak Ridge National Laboratory

11:10 AM

A Simulation Study of Shear Banding in Finite-sized Samples and Size-dependence of Yield Strength: *Pengyang Zhao*¹; Ju Li²; Yunzhi Wang¹; ¹The Ohio State University; ²Massachusetts Institute of Technology

11:20 AM Invited

Composition Interpretation of Ideal Metallic Glasses and Relevant Eutectics Using Cluster Formulas: Lingjie Luo¹; Hua Chen¹; Jianbing Qiang¹; Qing Wang²; Yingmin Wang¹; *Chuang Dong*¹; ¹Dalian University of Technology; ²Dalian University of Technology

Bulk Metallic Glasses XI — Structures and Mechanical Properties III

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

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Thursday AM
February 20, 2014

Room: 2
Location: San Diego Convention Center

Session Chairs: Jinn Chu, National Taiwan University of Science and Technology; Eric Homer, Brigham Young University

8:30 AM Invited

Thin Film Metallic Glasses for Microelectronic Applications: Properties and Potentials: *Jinn Chu*¹; S. F. Wang²; ¹National Taiwan University of Science and Technology; ²National Taipei University of Technology

8:50 AM

Analysis of the Effect of Loading Rate on Plastic Deformation of Zr-based Metallic Glasses by Broadband Nanoindentation Creep: *Zenon Melgarejo*¹; Joseph Jakes²; Matt Besser³; Matt Kramer³; Paul Voyles¹; Donald Stone¹; ¹University of Wisconsin-Madison; ²Performance Enhanced Biopolymers, United States Forest Service; ³Iowa State University, and Ames Laboratory (DOE)

9:00 AM Invited

Mechanical Behaviour of Metallic Glasses in Tension: *Jie Pan*¹; *Zhitao Wang*¹; *Yi Li*¹; ¹National University of Singapore

9:20 AM Invited

Examining the Initial Stages of Shear Localization in Amorphous Metals: *Eric Homer*¹; ¹Brigham Young University

9:40 AM

Deformation Mechanisms and Lattice Strain Evolution in Metallic Glass Composites from In Situ Synchrotron X-ray Measurements and Micromechanical Modeling: *Haoling Jia*¹; *Lili Zheng*¹; *Weidong Li*¹; *Nan Li*¹; *Junwei Qiao*¹; *Yang Ren*¹; *Peter Liaw*¹; *Yanfei Gao*¹; ¹University of Tennessee

9:50 AM Break

10:10 AM Invited

A Universal Fracture Criterion of High-strength Materials: *Zhefeng Zhang*¹; *Ruitao Qu*¹; ¹Institute of Metal Research

10:30 AM

Effect of Tungsten Volume Fraction on the Micro-deformation Mechanism of Zr-based Metallic Glass/Porous Tungsten Composites under Cyclic Compression: *Yunfei Xue*¹; *Lu Wang*¹; *Xinqiang Zhang*¹; *Yandong Wang*¹; *Zhihua Nie*¹; *Haifeng Zhang*¹; *Huameng Fu*¹; ¹Beijing Institute of Technology

10:40 AM Invited

Localized Deformation Behavior of $\text{Fe}_{52}\text{Co}_{20-x}\text{B}_{20}\text{Si}_4\text{Nb}_4\text{Cr}_x$ with $x = 0, 1, 3, 5$ at. Bulk Metallic Glasses under Nanoindentation: *Ki Buem Kim*¹; *Jung Tae Kim*¹; *Seung Hwan Hong*¹; ¹Sejong University

11:00 AM

Cluster Formulas of Alloy Phases in Relation to Metallic Glass and Quasicrystal Formation: *Chuang Dong*¹; *Jianbing Qiang*¹; *Lingjie Luo*²; *Yingmin Wang*¹; ¹Dalian University of Technology; ²Dalian University of Technology

11:10 AM

Mechanical Behavior of Bulk Metallic Glasses Subjected to Severe Plastic Deformation: *Harpreet Arora*¹; *H Grewal*²; *Harpreet Singh*²; *Sundeep Mukherjee*¹; ¹University of North Texas; ²Indian Institute of Technology Ropar

11:20 AM

Effects of Alloying Elements on Microstructure and Mechanical Properties for $\text{Mg}_{58.5}\text{Cu}_{30.5}\text{Y}_{11}$ Bulk Metallic Glass: *Wang Lin*¹; *Qiu Ke-qiang*¹; *You Jun-hua*¹; ¹Shenyang University of Technology

Cast Shop for Aluminum Production — General Cast Shop

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee

Program Organizer: Edward Williams, Alcoa

Thursday AM
February 20, 2014

Room: 15A
Location: San Diego Convention Center

Session Chair: Pete Forakis, Emirates Aluminum

8:30 AM Introductory Comments

8:35 AM

Development and Demonstration of a Molten Metal Cooling Trough to Improve Casthouse Performance: *André Larouche*¹; *Frédéric Borel*¹; *Jean Crépeau*¹; ¹Rio Tinto Alcan

9:00 AM

Commissioning and Start-up of Ingot Casting Machines in the Biggest Integrated Aluminum Complex in the World: *Abdullah Al-Garni*¹; *Khalid Al-Azmi*¹; *Nasser Al-Shammri*¹; ¹Maaden Aluminum Company

9:25 AM

Preventing Explosions In Maintenance Pits under Furnaces: *Alex Lowery*¹; ¹WISE CHEM LLC

9:50 AM

The Effect of Magnesium Supply on the Quality of Aluminum Melts: *Heather Drieling*¹; *D. Corleen Chesonis*¹; ¹Alcoa Technical Center

10:15 AM Break

10:30 AM

Effects of Microstructure and Defects on Tensile and Fracture Behaviour of a HPDC Component; Potential Properties and Actual Outcome of EN AC-44300 Alloy: *Mohammadreza Zamani*¹; *Salem Seifeddine*¹; *Anders Jarfors*¹; ¹Jonkoping University

10:55 AM

Thermal Parameters Analysis during Directional Solidification of Al-Cu Eutectic Alloys: *Alex Kociubczyk*¹; *Federico Cabello*²; *Carlos Schvezov*³; *Ricardo Gregorutti*⁴; *Alicia Ares*³; ¹Materials Institute of Misiones - IMAM (CONICET-UNaM); ²UNAM (University of Misiones), Faculty of Sciences.; ³Materials Institute of Misiones - IMAM (CONICET-UNaM). Faculty of Sciences.; ⁴LEMIT- CIC. Engineering Faculty. National University of La Plata.

Celebrating the Megascale: An EPD Symposium in Honor of David G.C.Robertson — Pyrometallurgy Process Fundamentals I

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, WA School of Mines; Geoffrey Brooks, Swinburne University of Technology

Thursday AM
February 20, 2014

Room: 16A
Location: San Diego Convention Center

Session Chairs: Mansoor Barati, University of Toronto; P. Pistorius, Carnegie Mellon University

8:30 AM Introductory Comments

8:35 AM

Oxidation of Flash Reduced Iron Particles in Various Gas Mixtures under the Conditions of a Novel Flash Ironmaking Process: *Zhixue Yuan*¹; *Hong Yong Sohn*¹; *Miguel Olivas-Martinez*¹; ¹University of Utah



8:55 AM Invited

A New Approach to Investigating Coke Reactivity: *Brian Monaghan*¹; Ray Longbottom¹; Mark Reid¹; Oluwatosin Aladejebi¹; Apsara Jayasekara¹; Marc in het Panhuis¹; ¹University of Wollongong

9:15 AM Invited

The Use of Natural Gas for Reduction of Metal Oxides: Constraints and Prospects: *Oleg Ostrovski*¹; ¹University of New South Wales

9:35 AM

Decomposition of Methane during Oxide Reduction Using Natural Gas: *Halvor Dalaker*¹; Pål Tetlie¹; ¹SINTEF Materials and Chemistry

9:55 AM Break

10:15 AM

Reduction of the Ni- and Ti-oxide Mixtures by Natural Gas: *Casper van der Eijk*¹; Kai Tang¹; ¹SINTEF

10:35 AM Invited

Kinetic and Thermodynamic Analyses of the Reduction of Oxides of CU and CO in a SiO₂-CAO-(AL,FE)₂O₃ Slag: Yotamu Hara¹; *Animesh Jha*¹; ¹Leeds University

10:55 AM

Carbothermic Reduction of Ilmenite Concentrate with Coke Assisted by High Energy Ball Milling: Bing Song¹; Kai Zhang¹; Fei Xi¹; Xuewei Lv¹; ¹Chongqing University

11:15 AM

Optimization of the Energy Consumption of Metal Electrowinning from Oxides: *Maria Paula Angarita*¹; Antoine Allanore¹; ¹Massachusetts Institute of Technology

11:35 AM

Reaction Mechanism and Reaction Rate of Sn Evaporation from Liquid Steel: Sung-Hoon Jung¹; *Youn-Bae Kang*¹; ¹Graduate Institute of Ferrous Technology, Pohang University of Science and Technology

Characterization of Minerals, Metals and Materials 2014 — Characterization in Material Extraction

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

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Thursday AM
February 20, 2014

Room: 7A
Location: San Diego Convention Center

Session Chairs: Zhiwei Peng, Michigan Technological Univ; Ailiang Chen, Central South University

8:30 AM

Effects of Iron and Manganese Ions on Potentiostatic Current Transients for Copper Electrodeposition: *Ailiang Chen*¹; Jiann-Yang Hwang²; Zhiwei Peng²; Yutian Ma³; Xuheng Liu¹; Xingyu Chen¹; ¹Central South University; ²Michigan Technological University; ³Jinchuan Group Co. Ltd

8:50 AM

Determination and Optimization Best Condition for Bioleaching of Sulfide Low Grade Copper Ore by Using DOE(Design of Experimental) Method: *Hossein Eminan*¹; Hekmat Razavizadeh²; ¹GolGohar Mining & Industrial Company; ²IUST

9:10 AM

Determination of Leaching Reaction Mechanism of Synthetic CaMoO₄ in H₂C₂O₄ Solutions: *Sedat Ilhan*¹; Ahmet Kalpakli¹; Ibrahim Yusufoglu¹; ¹Istanbul University

9:30 AM

Effect of V₂O₅ and TiO₂ on the Dissolution of Lime in FeO-SiO₂-V₂O₅-TiO₂ Slag: *Rui Tang*¹; Yu Wang¹; Shuo Wang¹; Bing Xie¹; Jiang Diao¹; ¹Chongqing University

9:50 AM

Characterization of Wastes Generated during Stainless Steel Production: *Xulong Liu*¹; Jing Zhang¹; Qing Xiao¹; Qiuju Li¹; ¹Shanghai Key Laboratory of Modern Metallurgy & Materials Processing, Shanghai University

10:10 AM Break

10:20 AM

Investigation of Reaction Stoichiometry of Leaching of Synthetic CaWO₄ in H₂C₂O₄ Solutions: *Ahmet Kalpakli*¹; Sedat Ilhan¹; Ibrahim Yusufoglu¹; ¹Istanbul University

10:40 AM

Separation of Shell and Core of Roasted Double-Layered Pellets: *Yang Yong-bin*¹; Fang Chen¹; Li Qian¹; Jiang Tao¹; Ge Jie¹; ¹Central South University

11:00 AM

The Study of Extraction Titanium from Titanium-bearing Blast Furnace Slag: *Qing Xiao*¹; Jing Zhang¹; Yahui Feng¹; Qiuju Li¹; ¹Shanghai University

11:20 AM

Study on Characteristics of Stamping Cokes and Top Charging Cokes: Bing Gao¹; ¹University of Science and Technology Beijing

Characterization of Minerals, Metals and Materials 2014 — Characterization of Soft Materials I

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

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Thursday AM
February 20, 2014

Room: 7B
Location: San Diego Convention Center

Session Chair: Sergio Neves Monteiro, State University of North Rio de Janeiro

8:30 AM

Flexural Mechanical Characterizations of Polyester Matrix Composites Reinforced with Continuous and Aligned Banana Fibers: Foluke Salgado¹; Frederico Margem¹; *Sergio Monteiro*¹; Romulo Loiola¹; ¹Universidade Estadual do Norte Fluminense

8:50 AM

Environmentally Assisted Degradation and Failure Analysis of Polymeric Webbing Material: *Pawan Maharjan*¹; ¹Texas Tech University

9:10 AM

Thermal Characterization of Epoxy Matrix Reinforced with Buriti Fibers by the Photoacoustic Technique: *Giulio Altoé*¹; Sérgio Monteiro²; Frederico Margem¹; Roberto Faria Jr.¹; Thallis Cordeiro¹; ¹State University of the Northern Rio de Janeiro - UENF; ²Military Institute of Engineering, IME

9:30 AM

Characterization of Thermal Properties of Polyester Matrix Reinforced with Sisal Fibers by Photoacoustic Technique: Artur Camposo Pereira¹; Sergio Monteiro¹; *Frederico Margem*¹; Thallis Cordeiro¹; Roberto Faria Jr.¹; ¹Universidade Estadual do Norte Fluminense

9:50 AM Break

10:10 AM

Izod Impact Tests Polyester Matrix Composites Reinforced with Malva Fibers: *Jean Margem*¹; Frederico Margem¹; Marina Margem¹; Vinicius Alves¹; Sergio Monteiro²; ¹UENF University State Northern Rio de Janeiro; ²Military Institute of the Engineering

10:30 AM

Charpy Impact Tests in Epoxy Matrix Composites Reinforced with Malva Fibers: Jean Margem¹; Marina Margem¹; frederico margem¹; *vinicius gomes*¹; sergio monteiro²; ¹UENF University State Northern Rio de Janeiro; ²Military Institute of the Engineering

10:50 AM

Characterization of Thermal Properties of Curaua Fibers Incorporated in Epoxy Matrix by Photothermal and Photoacoustic Techniques: Noan Simonassi¹; *Frederico Margem*¹; Rômulo Loiola¹; Sergio Monteiro¹; Roberto Faria¹; Thallis Cordeiro¹; ¹State University of the Northern Rio de Janeiro

11:10 AM

Bending Tests in Polyester Composites Reinforced with Bamboo Fibers of the Specimen *Dendrocalmus Giganteus*: *Lucas Martins*¹; Frederico Margem¹; Sérgio Monteiro²; Rômulo Loyola¹; Igor Margem¹; ¹UENF; ²IME

Computational Discovery of Novel Materials — Physical Properties of New Materials

Sponsored by: TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS/ASM: Computational Materials Science and Engineering Committee

Program Organizers: Francesca Tavazza, National Institute of Standards and Technology; Richard Hennig, Cornell University; Dallas Trinkle, University of Illinois, Urbana-Champaign

Thursday AM

Room: 31A

February 20, 2014

Location: San Diego Convention Center

Session Chair: Francesca Tavazza, NIST

8:30 AM Invited

Rare-earth Element Alternatives in Alloy Design: Contributions from First-principles Calculations: *Susan Sinnott*¹; Aakash Kumar¹; Srikant Srinivasan²; Scott Scott Broderick²; Krishna Rajan²; ¹University of Florida; ²Iowa State University

9:00 AM

High-throughput Calculations of Solute Effects on Bulk and Defect Properties in Rhenium Alloys: *Maarten de Jong*¹; David Olmsted¹; Liang Qi¹; Axel van de Walle²; Mark Asta¹; ¹UC Berkeley; ²Brown University

9:20 AM Invited

Free Energies of Novel Metal Oxides and Metal Oxide Surfaces at High Temperatures and Pressures Using Thermodynamics Informed by Density Functional Theory: *Donald Brenner*¹; Christopher O'Brien¹; Zsolt Rak¹; ¹North Carolina State University

9:50 AM Break

10:00 AM Invited

Computational Discovery and Design of Novel Single-layer Materials for Energy Technologies and Electronic Applications: Houlong Zhuang¹; Arunima Singh¹; *Richard Hennig*¹; ¹Cornell University

10:30 AM

Ab Initio Calculations of the Optical Properties of Cubic CdS Single Crystal: *Shadia Ikhmayies*¹; Bothina Hamad²; ¹Al Isra University; ²University of Jordan

10:50 AM

Discovery of Novel LPSO Strengthening Precipitates in Mg-based Alloys with High-throughput DFT: *James Saal*¹; Chris Wolverton¹; ¹Northwestern University

11:10 AM

Computational Design and Optimization of Graded Corrosion Coatings: *Samuel Cross*¹; Christopher Schuh¹; ¹MIT

11:30 AM

First-principles Design of Hydrogen Dissociation Catalysts Based on Isoelectronic Metal Solid Solutions: *Sang Soo Han*¹; Dong Hwa Seo²; Hyungjun Kim³; ¹Korea Institute of Science and Technology; ²Seoul National University; ³Korea Advanced Institute of Science and Technology

Computational Thermodynamics and Kinetics — Plasticity/Alloy/Grain Growth/Grain Boundary Properties

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

Thursday AM

Room: 30D

February 20, 2014

Location: San Diego Convention Center

Session Chair: Elif Ertekin, University of Illinois at Urbana-Champaign

8:30 AM Invited

Statistical Approach to Modeling the Defect-mediated Plasticity and Deformation of Low-dimensional Nanostructures: *Elif Ertekin*¹; ¹University of Illinois

9:00 AM

Effect of Initial Grain Volume Distribution on Microstructural Evolution during Grain Growth: *Robert DeHoff*¹; Burton Patterson¹; Tyler Kaub¹; Veena Tikare²; ¹University of Florida; ²Sandia National Laboratories, New Mexico

9:20 AM

Long-term Atomistic Simulation of Heat Conduction and Mass Transport in Alloys: *Kevin Wang*¹; Michael Ortiz¹; ¹California Institute of Technology

9:40 AM

Abnormal Grain Growth in the Potts Model Incorporating Grain Boundary Complexion Transitions that Increase the Mobility of Individual Boundaries: *William Frazier*¹; Anthony Rollett¹; Gregory Rohrer¹; ¹Carnegie Mellon University

10:00 AM Break

10:20 AM

Multiscale Modeling of Strain Effects on Segregation in Ni-Si: *Thomas Garnier*¹; Zebo Li¹; Venkateswara Manga²; Dallas Trinkle¹; Maylise Nastar³; Pascal Bellon¹; ¹University of Illinois at Urbana Champaign; ²University of Arizona; ³CEA Saclay, SRMP

10:40 AM

Low-temperature Criticality of Martensitic Transformations of Cu Nanoprecipitates in Alpha-Fe: *Paul Erhart*¹; Babak Sadigh²; ¹Chalmers University of Technology; ²Lawrence Livermore National Laboratory

11:00 AM

Simulation of Grain Boundary Migration in Polycrystalline Graphene: *Dana Zoellner*¹; Jules Dake²; Simon Kurasch²; Ute Kaiser²; Carl Krill²; ¹Otto von Guericke University Magdeburg; ²Ulm University

11:20 AM

Simulation of Homogenous Precipitation Using the KWN Model and Evaluation of Interfacial Energy of Binary Systems Using Composition Gradient Samples: *Qiaofu Zhang*¹; Ji-Cheng Zhao¹; ¹The Ohio State University

11:40 AM

Thermodynamic and Kinetic Modeling of a Bond Coat Alloy: Oxidation Induced Depletion and Its Effect on Microstructure and Material Behavior: *S. Salam*¹; Y.D. Zhang¹; H.F. Wang¹; Z.G. Yang¹; C. Zhang¹; ¹Tsinghua University



Data Analytics for Materials Science and Manufacturing — Topology, Graph Theory, and Data Fusion

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Jeff Simmons, Air Force Research Laboratory; Charles Bouman, Purdue University; Fariba Fahroo, Air Force Office of Scientific Research; Surya Kalidindi, Georgia Institute of Technology; Jeremy Knopp, Air Force Research Laboratory; Peter Voorhees, Northwestern University

Thursday AM
February 20, 2014

Room: 30E
Location: San Diego Convention Center

Session Chairs: Tony Fast, Georgia Institute of Technology; Mary Comer, Purdue University

8:30 AM Invited

Not Your Father's Topology: Modern Views of Connectivity in Grain Structures: *David Srolovitz*¹; Emanuel Lazar¹; Jeremy Mason²; Robert MacPherson³; ¹University of Pennsylvania; ²Bosphorus University; ³Institute for Advanced Study

8:55 AM Invited

Scalable Graph-based Techniques for Large-scale Materials Data: *Sai Kiranmayee Samudrala*¹; Spencer Pfeifer²; Olga Wodo²; Jaroslaw Zola³; Krishna Rajan²; Baskar Ganapathysubramanian²; ¹Georgia Institute of Technology; ²Iowa State University; ³Rutgers University

9:20 AM Invited

Data Topology as a Framework for Materials Discovery and Material Mimetic Design: *Krishna Rajan*¹; Susan Sinnott²; Surendra Saxena³; James LeBeau⁴; ¹Iowa State University; ²University of Florida; ³Florida International University; ⁴North Carolina State University

9:45 AM Invited

A New Data Analytics Framework Integrating Multimodal and Ultra-fast Diagnostic Sensing with Prognostic Modeling for Materials Characterization: *Yiming Deng*¹; ¹University of Colorado Denver and Anschutz Medical Campus

10:10 AM Break

10:30 AM Invited

Bayesian Inference of Grain Boundary Properties from Heterogeneous Data: *Youssef Marzouk*¹; Michael Demkowicz¹; ¹Massachusetts Institute of Technology

10:55 AM Invited

Hyperspectral Image Analysis: From Qualitative to Quantitative Analysis: *Paul Koula*¹; ¹Sandia National Laboratories

11:20 AM Invited

2D/3D Data Registration and Fusion: *Emine Gulsoy*¹; ¹Northwestern University

11:45 AM

A Data Mining Approach in Structure: Property Optimization: *Ruoqian Liu*¹; Abhishek Kumar²; Zhengzhang Chen¹; Ankit Agrawal¹; Veera Sundararaghavan²; Alok Choudhary¹; ¹Northwestern University; ²University of Michigan, Ann Arbor

Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — Heterogeneous and Brittle Materials

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Thursday AM
February 20, 2014

Room: 3
Location: San Diego Convention Center

Session Chairs: Bill Proud, Imperial College; Luis Louro, Military Institute of Engineering

8:30 AM Invited

Plastic Flow and Lattice Dynamics Experiments on Shock and Ramp Loaded Ductile Metals at Extreme Pressures and Strain Rates: *Bruce Remington*¹; ¹Lawrence Livermore National Laboratory

8:50 AM Invited

Prediction of Probabilistic Ignition Behavior of Heterogeneous Energetic Materials with Multiple Sources of Material Stochasticity: Seokpum Kim¹; Ananda Barua¹; Yasuyuki Horie²; *Min Zhou*¹; ¹Georgia Institute of Technology; ²Air Force Research Laboratory

9:10 AM Invited

The Good, the Bad and the Ugly Defects—Controlling the Dynamic Failure Strength of Brittle Materials: K.T. Ramesh¹; *Nitin Daphalapurkar*¹; ¹The Johns Hopkins University

9:30 AM Invited

A Mechanisms Perspective on Why Spinel Outperforms Sapphire in Ballistic Tests Despite Its Inferior Properties: *Ghatu Subhash*¹; ¹University of Florida

9:50 AM Break

10:10 AM Invited

Mechanically-induced Amorphization and Nanocrystallization in Boron Carbide: *Jerry LaSalvia*¹; Vladislav Domnich²; Kelvin Xie³; Eugene Shanholtz¹; Scott Walck¹; DeCarlos Taylor¹; Todd Beaudet¹; ¹U.S. Army Research Laboratory; ²Rutgers University; ³Johns Hopkins University

10:30 AM Invited

Influence of Stress State and Strain Rate on Amorphization in Boron Carbide: *Ghatu Subhash*¹; Dipankar Ghosh²; ¹University of Florida; ²California Institute of Technology

10:50 AM Invited

The Dynamic Behavior of Granular Materials: *Tracy Vogler*¹; ¹Sandia National Laboratories

11:10 AM

Effect of Meso to Micro Transition and Effect of Grain Boundary Property Manipulation in Morphology Dependent Dynamic Fracture of SiC and W: Hongsuk Lee¹; *Vikas Tomar*¹; ¹Purdue University

11:30 AM

Mesoscale Simulations of Sand under Dynamic Loading and It's Constitutive Response: *Eric Herbold*¹; Scott Johnson¹; Oleg Vorobiev¹; Tarabay Antoun¹; ¹Lawrence Livermore National Laboratory

Electrode Technology for Aluminium Production — Rodding Operation and Anode Electrical Connections

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Andre Proulx, Rio Tinto Alcan

Thursday AM Room: 14B
February 20, 2014 Location: San Diego Convention Center

Session Chair: Duygu Kocaepe, Université du Québec à Chicoutimi

8:30 AM Introductory Comments

8:35 AM

Improving Energy Efficiency at Albras. A Case Study in the Rodding Shopping: *Paulo Douglas Vasconcelos*¹; ¹Albras Alumínio Brasileiro S.A

9:00 AM

ARTS - Anode & Rod Tracking System – A New Tool for Optimization of Anode Performance: *Manfred Beilstein*¹; Ivan Grle²; Alfred Harwardt¹; ¹Outotec GmbH; ²ALUMINIJ d.d.

9:25 AM

Anode Rodding Basics: *David Molenaar*¹; Barry Sadler²; ¹CSIRO; ²Net Carbon Consulting Pty Ltd

9:50 AM

Anode Electrical Resistance Measurements: Learning and Industrial On-line Measurement Equipment Development.: *Guillaume Léonard*¹; Sébastien Guérard¹; Denis Laroche¹; Jean-Claude Arnaud²; Stéphane Gourmaud³; Marc Gagnon⁴; Marie-Josée Chollier¹; Yvon Perron¹; ¹Rio Tinto Alcan / ARDC; ²Rio Tinto Alcan / Aluval; ³ECL; ⁴Aluminerie Alouette Inc

10:15 AM Break

10:25 AM

Automated Crack Detection Method Applied to CT Images of Baked Carbon Anode: *Donald Picard*¹; Julien Lauzon-Gauthier¹; Carl Duchesne¹; Houshang Alamdari¹; Mario Fafard¹; Donald Ziegler²; ¹Laval University; ²Alcoa Primary Metals

10:50 AM

Development of a New Methodology to Measure Contact Pressure Distribution along the Thermo-electro-mechanical Interfaces: *Mohammadreza Emami*¹; Daniel Marceau¹; Martin Désilets²; ¹University of Quebec at Chicoutimi; ²University of Sherbrooke

11:15 AM

Rodding in Hall Heroult Cells: An FEA Model that Predicts Room Temperature Mechanical Properties and Cracking Tendency of Thimbles: *Dayalan Gunasegaram*¹; *David Molenaar*¹; ¹CSIRO

11:40 AM

Temperature Fitting Method for Predicting Equidistant Voltage Drop of Anode Rod in Aluminum Reduction Cell: *Jianhong Li*¹; *Ganfeng Tu*²; Xiquan Qi³; Jing Liu³; Hui Dong³; Ying Zhang³; ¹Northeastern University; Liaoning University of Petroleum & Chemical Technology; ²Northeastern University; ³Northeastern University Engineering & Research Institute Co. Ltd.

Gamma TiAl Alloys 2014 — Session VII

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Titanium Committee
Program Organizers: Young-Won Kim, Gamteck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimiduk, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

Thursday AM Room: 6B
February 20, 2014 Location: San Diego Convention Center

Session Chairs: Junpin Lin, University of Science & Technology Beijing; Miguel Lagos, Tecnalia

8:30 AM Invited

Status of Titanium Aluminide for Aero Engine Applications: *Wilfried Smarsly*¹; ¹MTU Aero Engines AG

8:55 AM

Mechanical Properties of a TNM Alloy Protected by the Halogen Effect and Coated with a Thermal Barrier Coating: *Ariane Straubel*¹; Christoph Leyens¹; Simone Friedle²; Michael Schütze³; Nadine Laska⁴; Reinhold Braun⁴; ¹Technische Universität Dresden; ²DECHEMA-Forschungsinstitut; ³DECHEMA Forschungsinstitut; ⁴Deutsches Zentrum für Luft- und Raumfahrt

9:15 AM Invited

Composition Optimization of β - γ TiAl Alloys Containing High Niobium: *Laiqi Zhang*¹; Xiaoli Wang¹; Junzi Zheng¹; Yongming Hou¹; Junpin Lin¹; ¹University of Science and Technology Beijing

9:40 AM Invited

The Effects of Microstructure on Impact Resistant Properties in Forged TiAl Alloys: *Satoshi Takahashi*¹; Keiji Kubushiro¹; Masao Takeyama¹; ¹IHI Corporation

10:00 AM Break

10:20 AM Invited

Wrought TiAl Blades: *Peter Janschek*¹; ¹Leitritzturbinentechnik GmbH

10:45 AM

Phase Transformation and Equilibrium Diagram of Ti-Al-Nb Ternary Alloy: *Yong Xu*¹; Guojian Hao²; Yongfeng Liang²; Xiangjun Xu³; Junpin Lin²; ¹Shandong Jianzhu University; ²University of Science and Technology Beijing; ³Zhongyuan University of Technology

11:05 AM Invited

Beta Gamma Alloys: The First Fine-grained Engineering FL Gamma TiAl Alloys: *Young-Won Kim*¹; Sang-Lan Kim²; ¹Gamteck, Inc.; ²UES, Inc.

11:30 AM

Fine-grained Fully Lamellar Beta Gamma Cast Alloys for High Temperature Rotational Components: *Scott Reed*¹; Young-Won Kim²; ¹Flowserve; ²Gamteck, Inc.



Integration of Materials Science and Nondestructive Evaluation for Materials Characterization — Quantitative Nondestructive Characterization II: Titanium Alloys

Sponsored by: TMS Structural Materials Division, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Adam Pilchak, Air Force Research Laboratory; Dennis Dimiduk, Air Force Research Laboratory; Eric Lindgren, Air Force Research Laboratory; Richard Lesar, Iowa State University; Leonard Bond, Iowa State University

Thursday AM
February 20, 2014

Room: 8
Location: San Diego Convention Center

Session Chairs: Adam Pilchak, Air Force Research Laboratory; Stan Rokhlin, The Ohio State University

8:30 AM Invited

Ultrasonic Wave Propagation in Polycrystal Hexagonal Alloys: Computational and Experimental Studies Combined with EBSD for Texture Detection: *Bo Lan*¹; Fionn Dunne²; Mike Lowe²; ¹Oxford University; ²Imperial College London

9:00 AM

Integration of Quantitative NDE and Process Modeling: ICME for the Production Environment: *Adam Pilchak*¹; Christopher Szczepanski¹; Jia Li²; Nick Sonntag³; Stan Rokhlin²; Lee Semiatin¹; Jon Miller¹; ¹Air Force Research Laboratory; ²The Ohio State University; ³ATI Ladish

9:20 AM Invited

Characterization of Polycrystals by Ultrasonic Scattering. Effect of Texture and Microtexture: *Stan Rokhlin*¹; Jia Li¹; ¹The Ohio State University

9:50 AM Break

10:00 AM Invited

A Novel Microtexture Assessment Methodology for Dwell Sensitive Titanium Alloys: *Michael Glavicic*¹; Kate Fox²; Richard Whittaker²; Mulyadi Mulyadi²; Matt Thomas³; Ayman Salem⁴; Steve Sharples⁵; ¹Rolls-Royce; ²Rolls-Royce plc; ³TIMET UK; ⁴Materials Resources LLC; ⁵University of Nottingham

10:30 AM Invited

Spatially Resolved Acoustic Spectroscopy – Material Characterization, from Microns to Metres: Steve Sharples¹; *Wenqi Li*¹; Richard Smith¹; Jethro Coulson¹; Matt Clark¹; Michael Somekh¹; ¹University of Nottingham

11:00 AM Invited

Applying Microstructure Informatics to EBSD and SRAS Big-data to Quantify Microtexture Heterogeneity in Ti Alloys: *Ayman Salem*¹; Michael Glavicic²; Kate Fox³; Richard Whittaker³; Mulyadi Mulyadi³; Matthew Thomas⁴; Steve Sharples⁵; ¹Materials Resources LLC; ²Rolls-Royce Corporation; ³Rolls-Royce plc; ⁴TIMET UK LTD; ⁵University of Nottingham

11:30 AM Panel Discussion

Length Scaling of Lamellar and Patterned Microstructures During Solid-Solid Phase Transformations and Solidification — Growth Kinetics and Precipitate Morphology

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee, TMS: Solidification Committee

Program Organizers: Robert Hackenberg, Los Alamos National Laboratory; Carlos Capdevila-Montes, CENIM-CSIC; Amy Clarke, Los Alamos National Laboratory; John Perepezko, University of Wisconsin-Madison

Thursday AM
February 20, 2014

Room: 32A
Location: San Diego Convention Center

Session Chairs: Francisca Caballero, Spanish National Research Center for Metallurgy (CENIM-CSIC); Rajarshi Banerjee, University of North Texas

8:30 AM Invited

Determining Thermodynamic and Kinetic Conditions for Pearlite vs. Cellular Formation above the Upper Ae1 in Fe-C-12Mn: Aleks Ontman¹; *Gary Shifler*¹; ¹University of Virginia

9:00 AM Invited

Diffusion-controlled Growth of Pearlite in Ternary Steels: *Ashwin Pandit*¹; H. K. D. H. Bhadeshia²; ¹Tata Steel Limited; ²University of Cambridge

9:30 AM

Manganese Partitioning during Pearlite Growth in Fe-C-Mn Medium Carbon Steel: *Maria Martín-Aranda*¹; Carlos Capdevila Montes¹; Robert E. Hackenberg²; Michael K. Miller³; Esteban Urones-Garrote⁴; ¹CENIM-CSIC; ²Los Alamos National Laboratory; ³Oak Ridge National Laboratory; ⁴Universidad Complutense de Madrid, Centro Nacional de Microscopía Electrónica

9:55 AM Break

10:15 AM Invited

In Situ Observations of Moving Interfaces during DP Reaction: *Pawel Zieba*¹; ¹Polish Academy of Sciences

10:45 AM

Lamellar and Nonlamellar Decomposition in U-Nb: Energy Sinks and Approach to Equilibrium: *Robert Hackenberg*¹; Anna Llobet¹; Heather Volz¹; Robert Forsyth¹; Pallas Papin¹; Ann Kelly¹; Tim Tucker¹; Kester Clarke¹; Alice Smith¹; GERALYN Hemphill¹; Megan Emigh²; ¹Los Alamos National Laboratory; ²University of Illinois

11:10 AM

Competing Mechanisms between Continuous and Discontinuous Precipitation of Gamma Prime Precipitation in Ternary Nickel Base Alloys: *Tanaporn Rojhirunsakool*¹; Soumya Nag¹; Jaimie Tiley²; Rajarshi Banerjee¹; ¹University of North Texas; ²Wright-Patterson Air Force Base

11:35 AM

Microstructural Features of Secondary Phase Precipitation in Alloy ATI 718Plus®: *Ana Casanova*¹; Robert Krakow¹; Olivier Messé¹; Ed Pickering¹; Mark Hardy²; Catherine Rae¹; ¹University of Cambridge; ²Rolls-Royce plc

Magnesium Technology 2014 — Corrosion and Coatings

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Thursday AM
February 20, 2014
Room: 19
Location: San Diego Convention Center

Session Chairs: J. Jordon, The University of Alabama; Eric Nyberg, Pacific Northwest National Laboratory

8:30 AM

Enhancing Corrosion Resistance by a Hydrophobic Surface Feature for Magnesium Alloy AZ91D: *Xiaobo Chen*¹; Chong Ke¹; Nick Birbilis¹; ¹Monash University

8:50 AM

Oxidation and Corrosion Behavior of Non-flammable Magnesium Alloys Containing Ca and Y: *Bong Sun You*¹; Young Min Kim¹; Chang Dong Yim¹; Ha Sik Kim¹; ¹Korea Institute of Materials Science

9:10 AM

Corrosion Behavior of Magnesium Alloys Containing Sn and Zn: *Chang Dong Yim*¹; Sang Kyu Woo²; Jie Yang²; Bong Sun You¹; ¹Korea Institute of Materials Science; ²University of Science and Technology

9:30 AM

Effect of Surface Condition on the Localized Corrosion Behavior of Magnesium Alloy AZ31B: *Zach Cano*¹; Joey Kish¹; Joe McDermid¹; ¹McMaster University

9:50 AM

Formation of Self-assembled Monolayers on Cerium Conversion Coated AZ31 Mg Alloy: *S. Salman*¹; A Nagata²; K Kuroda³; M Okido³; ¹Graduate School of Engineering, Al-Azhar University; ²Graduate School of Engineering, Nagoya University; ³EcoTopia Science Institute, Nagoya University

10:10 AM Break

10:30 AM

Effects of Current Density on Microstructure and Corrosion Property of Coating on AZ31 Mg Alloy Processed via Plasma Electrolytic Oxidation: Kang Min Lee¹; Feryar Einkhah²; Mohammad Ali Sani²; Young Gun Ko³; *Dong Hyuk Shin*¹; ¹Hanyang University; ²Sharif University of Technology; ³Yeungnam University

10:50 AM

Corrosion-stress Relaxation Effects on Tensile Properties of an AZ61 Magnesium Alloy: *Holly Martin*¹; Christopher Walton²; Kamecia Bruce²; Ayesha Hicks²; M.F. Horstemeyer²; Wilburn Whittingham²; Paul Wang²; ¹Chemical Engineering, Youngstown State University; ²Center for Advanced Vehicular Systems, Mississippi State University

11:10 AM

Corrosion Behaviour of Friction Stir Welded AZ31 Joints for Automotive Applications: *Xiangrong(Sarah) Zhang*¹; Zach Cano¹; B.M. Wilson¹; J.R. Kish¹; J.R. McDermid¹; ¹McMaster University

Magnesium Technology 2014 — Wrought Processing II and Joining

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Thursday AM
February 20, 2014
Room: 17A
Location: San Diego Convention Center

Session Chairs: Amit Pandey, Rolls Royce LG Fuel Cell; Suveen Mathaudhu

8:30 AM

Spike-forging of As-cast TX32 Magnesium Alloy: *Pitcheswara Kaminen*¹; K. Suresh¹; Norbert Hort²; Karl Kainer²; ¹City University of Hong Kong; ²Helmholtz-Zentrum Geesthacht

8:50 AM

An Introduction to the Forging of Elektron 43 – A High Performance Wrought Magnesium Alloy: *Dominic Henry*¹; Mark Turski¹; Paul Lyon¹; Tim Wilks¹; ¹Magnesium Elektron

9:10 AM

Structure and Properties of Interlayer Formed between Magnesium Alloy Core and Aluminium Alloy Cover during Deformation: *Sonia Boczkal*¹; Piotr Korczak¹; Bartlomiej Plonka¹; Wojciech Szymanski¹; Marek Nowak¹; ¹Institute of Non-Ferrous Metals in Gliwice

9:30 AM Invited

A Novel Process for Producing Large Scale mg-Sheets: *Norbert Grittner*¹; ¹Leibniz Universität Hannover Institut für Werkstoffkunde

9:50 AM

Effect of Volume Fraction of Icosahedral Phase in CaO Added Mg-Zn-Y Alloys: *Hyunkyu Lim*¹; Dae-Guen Kim¹; Tae-Yang Kwak¹; Wonseok Yang¹; Hak Young Kim¹; Young-Ok Yoon¹; Shae K. Kim¹; ¹KITECH

10:10 AM Break

10:30 AM

Effect of CaO on Hot Workability, Microstructures, and Mechanical Properties of Mg-9.5Zn-2Y Alloy: Tae-yang Kwak¹; Daeguen Kim¹; Jaehack Yang¹; Young-ok Yoon¹; Shae k. Kim¹; Hyunkyu Lim¹; Woo Jin Kim²; ¹Korea Institute of Industrial Technology; ²Hong-Ik University

10:50 AM

Welding of Dissimilar Light Metals by Disk Laser: *Miroslav Sahul*¹; Milan Turna¹; Martin Sahul¹; ¹Slovak University of Technology Bratislava, Faculty of Materials Science and Technology in Trnava

11:10 AM

Suggestion of a Binary Zinc-based Solder for Joining Mg Alloy AZ 31B: Milan Turna¹; Milan Ozvold¹; Miroslav Jána¹; *Miroslav Sahul*¹; ¹Slovak University of Technology Bratislava, Faculty of Materials Science and Technology in Trnava

11:30 AM

Friction Stir Welding of Magnesium Alloy Type AZ 31: Tomáš Kupec¹; Mária Behúlová¹; Milan Turna¹; *Miroslav Sahul*¹; ¹Slovak University of Technology Bratislava, Faculty of Materials Science and Technology in Trnava

11:50 AM

Effects of Process Parameters on Texture Development of ZEK100 Mg Sheets during Friction Stir Spot Welding: *Rogie Rodriguez*¹; J Jordon¹; ¹The University of Alabama



Magnetic Materials for Energy Applications IV — High Performance Soft Magnets II (This is a joint session with Advanced Materials for Power Electronics, Power Conditioning and Power Conversion II)

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS:
Magnetic Materials Committee

Program Organizers: Thomas G. Woodcock, IFW Dresden; Julia Lyubina, Evonik
Industries AG; Matthew Willard, Case Western Reserve University

Thursday AM
February 20, 2014

Room: Ballroom G
Location: San Diego Marriott Marquis & Marina

Session Chairs: Paul R. Ohodnicki, Jr., National Energy Technology Laboratory; Ivan
Skorvanek, Slovak Academy of Sciences

8:30 AM Invited

Analysis of Soft Magnetic Materials for Energy Applications: *Samuel
Kernion*¹; Tanjore Jayaraman¹; Alex Leary²; Michael McHenry²; ¹Carpenter
Technology Corporation; ²Carnegie Mellon University

9:00 AM

**Fe-rich FeSiBPCu Nano-crystalline Soft Magnetic Alloys Contributable
To Energy-saving:** *Akihiro Makino*¹; ¹Tohoku University

9:20 AM

CoNiFe Alloy Powder Synthesis by High Energy Milling: *Jesus Calata*¹;
Alex Aning¹; Aaron Okwei¹; Guo-Quan Lu¹; Khai Ngo¹; ¹Virginia Tech

9:40 AM Invited

**Novel Morphology of Highly Efficient Two-phase Ferrite Cores for Power
Systems:** *Vincent Harris*¹; Yajie Chen¹; ¹Northeastern University

10:10 AM Break

10:25 AM Invited

**The Use of Pressure and Strain as Processing Variables in Soft Magnetic
Nanocomposite Materials:** *Alex Leary*¹; Vincent DeGeorge¹; Paul Ohodnicki²;
Michael McHenry¹; ¹Carnegie Mellon University; ²National Energy
Technology Laboratory

10:55 AM

**Application of Small Angle Scattering to FeCo-based Soft Magnetic
Nanocomposites:** *Paul Ohodnicki*¹; Vincent Sokalski²; Vincent DeGeorge²;
Michael McHenry²; David Laughlin²; Jeffrey Kortright³; ¹National Energy
Technology Laboratory; ²Carnegie Mellon University; ³Lawrence Berkeley
National Laboratory

11:15 AM

**Fabrication of Nanocrystalline Magnetic Materials for Use in Energy-
efficient Distribution Transformers:** Naoki Ito¹; *Eric Theisen*¹; Motoki
Ohta¹; Ryusuke Hasegawa¹; ¹Metglas Inc.

11:35 AM

**Thin Ferrite Films Compared to Oxide Coated Iron Powder for
Electromagnetic Devices:** *Katie Jo Sunday*¹; Kris Darling²; Mitra Taheri¹;
¹Drexel University; ²Army Research Laboratory

Materials and Fuels for the Current and Advanced Nuclear Reactors III — Structural Materials IV

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

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis
Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Thursday AM
February 20, 2014

Room: 33C
Location: San Diego Convention Center

Session Chair: Indrajit Charit, University of Idaho

8:30 AM

**Structure and Properties of Modified High Nitrogen Austenitic Stainless
Steels:** Jake Harris¹; *Maxim Gussev*²; Jeremy Busby²; ¹Ohio State University;
²Oak Ridge National Laboratory

8:45 AM

**Effect of Laser Shock Peening on SCC Behavior of Alloy 600 in Sulfur
Bearing Solutions:** *Abhishek Telang*¹; Chang Ye¹; Amrinder Gill¹; Sebastien
Teyssseyre²; Vijay Vasudevan¹; ¹University of Cincinnati; ²Idaho National
Laboratory

9:00 AM

**Effect of Creep Deformation on Surface Degradation of Alloy 617 at 800°C
in Impure He Environments:** *Alfred Okello*¹; Gokce Gulsoy¹; Gary Was¹; J.
Wayne Jones¹; ¹University of Michigan

9:15 AM

Transition in Creep Mechanisms in HANA-4 Zirconium Alloy: *Boopathy
Kombaiah*¹; Apu Sarkar¹; Linga Murty Korukonda¹; ¹North Carolina State
University

9:30 AM

**Evaluation of Vanadium Carbide for Mitigating Fuel Cladding Chemical
Interaction:** *Wei-Yang Lo*¹; Robert Weinmann-Smith¹; Yong Yang¹; ¹University
of Florida

9:45 AM

**Thermo-mechanical Processed Two-dimensional Linear Plane-strain
Machining of 316L Austenitic Stainless Steel for Improved SCC Resistance:**
*Yaakov Idell*¹; Andreas Kulovits²; Giovanni Facco¹; Jorg Wiezorek¹; ¹University
of Pittsburgh; ²Carnegie Mellon University

10:00 AM Break

10:20 AM

**Stress Corrosion Crack Initiation of Alloy 690 in Subcritical and
Supercritical Water:** *Tyler Moss*¹; Gary Was¹; ¹University of Michigan

10:35 AM

**Oxidation of Alloy 617 in Controlled Impure Helium Environments at
High Temperatures:** *Gokce Gulsoy*¹; Gary Was¹; ¹University of Michigan

10:50 AM

**The Nanoparticle-matrix Orientation Relationship and the Strengthening
Mechanism in Austenitic ODS Stainless Steels:** *Yinbin Miao*¹; Kun Mo¹; Bai
Cui¹; Wei-Ying Chen¹; Virginia McCreary¹; David Gross¹; Ian Robertson²;
James Stubbins¹; ¹University of Illinois at Urbana-Champaign; ²University of
Wisconsin-Madison

11:05 AM

Irradiation Effects on Fission Product Behavior in PyC and SiC: *Shyam
Dwaraknath*¹; Gary Was¹; ¹University of Michigan

11:20 AM

**Effect of Milling and Precipitation Reinforcement on Grain Growth in
Oxide-dispersion Strengthened Steels:** *Xavier Boulnat*¹; Nicolas Sallez²;
Andras Borbély³; Cristian Mocuta⁴; Louis Hennem⁵; Dominique Thiaudiere⁴;
Joel Malaplate¹; Jean-Luc Béchade¹; Yann de Carlan¹; Pauline Moyaert¹;
Patricia Donnadiou²; Damien Fabrègue⁶; Michel Perez⁶; Yves Bréchet²; ¹CEA,
DEN; ²Laboratoire SIMAP; ³Ecole Supérieure des Mines de Saint Etienne;
⁴Synchrotron SOLEIL; ⁵CEMHTI-CNRS UPR3079; ⁶INSA Lyon - MATEIS

11:35 AM

Micro-texture Development in Relation to Total Circumferential Elongation: Burst Test Performance in Zircaloy-4 Clads: *Gulshan Kumar*¹; Indradev Samajdar¹; Dinesh Srivastava²; Gauttam Dey²; N Saibaba; Ramesh Singh¹; ¹Indian Institute of Technology, Bombay(IIT Bombay); ²Bhabha Atomic Research Center (BARC), Trombay

Materials Aspects of Corrosion and Fouling in Oil Refining and Exploration — Session III

Sponsored by: TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee

Program Organizer: David Mitlin, University of Alberta and NINT NRC

Thursday AM
February 20, 2014

Room: Mission Hills
Location: San Diego Marriott Marquis & Marina

Session Chair: To Be Announced

8:30 AM Keynote

Challenges & Processes for Deepwater: A DeepStar Perspective: *Greg Kusinski*¹; ¹Chevron

8:50 AM Invited

Managing Corrosion and Erosion-corrosion Using Surface Engineering: *Anne Neville*¹; ¹Leeds University

9:10 AM Invited

Micro and Nano-enabled Separation Technologies for the Oil and Gas Applications: *Michael Ohadi*¹; ¹University of Maryland

9:30 AM Invited

Hygro-responsive Surfaces: A New Approach for Oil-water Separation: *Anish Tuteja*¹; Gibum Kwon¹; Arun Kota¹; Joseph Mabry²; ¹University of Michigan; ²Air Force Research Laboratory

9:50 AM Break

10:00 AM Invited

Fouling Investigation via CFD Modeling of Annular Multiphase Flows during Underbalanced Drilling (UBD): *Dimitrios Gerogiorgis*¹; Vasilios Kelessidis²; ¹University of Edinburgh; ²Texas A&M University at Qatar

10:20 AM Invited

Novel Organic Coatings for Stainless Steels' Fouling and Corrosion Minimization: *Simo Pehkonen*¹; Shaojun Yuan²; ¹Masdar Institute of Science and Technology; ²Sichuan University

10:40 AM Invited

Ultrasonic Computerized Tomography of Pipelines for Continuous Monitoring of Corrosion and Erosion Damage: *Francesco Simonetti*¹; ¹University of Cincinnati

11:00 AM Invited

A Mechanistic Model for Pipeline Steel Corrosion in Supercritical CO₂/SO₂/O₂/H₂O Environments: *Zhe Wang*¹; Yong Xiang¹; Zheng Li¹; ¹Tsinghua University

Materials for High-temperature Applications: Next Generation Superalloys and Beyond — Oxidation and Coatings

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Refractory Metals Committee

Program Organizers: Omer Dogan, DOE National Energy Technology Laboratory; Panos Tsakiroopoulos, University of Sheffield; Xingbo Liu, West Virginia University; Paul Jablonski, DOE National Energy Technology Laboratory; Junpin Lin, University of Science and Technology Beijing

Thursday AM
February 20, 2014

Room: 6D
Location: San Diego Convention Center

Session Chairs: Xingbo Liu, West Virginia University; Gary Rozak, H.C. Starck, Inc.

8:30 AM Invited

Protective Scale Formation on Alloys and Coatings Exposed to Harsh Conditions: *Brian Gleeson*¹; ¹University of Pittsburgh

9:00 AM Invited

Beyond Ni-base Superalloys: The Environmental Resistance Barrier: *Bruce Pint*¹; ¹Oak Ridge National Laboratory

9:30 AM Invited

Oxidation Behavior of Si-Al-Y Co-deposition Coating on an Nb-Ti-Si Based Ultrahigh Temperature Alloy in the Temperature Range of 800-1350°C: *Xiping Guo*¹; Jing Li¹; Ping Guan¹; ¹Northwestern Polytechnical University

10:00 AM

HVOF Thermal Spray TiC/TiB₂ Coatings of AUSC Boiler/Turbine Components for Enhanced Corrosion Protection: *Kanchan Mondal*¹; Rasit Koc¹; Chinbay Fan²; Chung-Ying Tsai¹; Ronald Stanis²; ¹Southern Illinois University; ²Gas Technology Institute

10:20 AM Break

10:35 AM

Mo-Si-B Based Coating for Oxidation Protection of SiC Composites: *Patrick Rittl*¹; John Perepezko¹; ¹University of Wisconsin-Madison

10:55 AM

Determination of the Mode II Interfacial Fracture Toughness of Thermal Barrier Coatings with the Compression Edge-delamination Test: *Simon Lockyer-Bratton*¹; Jaafar El-Awady¹; Kevin Hemker¹; ¹Johns Hopkins University

11:15 AM

Experimental Measurements of the Elastic Response of EBPVD Ytria-stabilized Zirconia Thermal Barrier Coatings: *Binwei Zhang*¹; R. Jackson²; Carlos Levi²; Brady Butler³; Jaafar El-Awady¹; Kevin Hemker¹; ¹Johns Hopkins University; ²University of California, Santa Barbara; ³U.S Army Research Laboratory

11:35 AM

Development of a Multi-layered Oxide Scale during the Oxidation of Hyper-eutectic NiAl-Mo Alloys: *Pratik Ray*¹; Mufit Akinc²; Matthew Kramer¹; ¹Ames Laboratory, US-DOE; ²Iowa State University

11:55 AM

Al-Cr-Si Based Alloys for Coatings for Refractory Metal Silicide Alloys: *Amir Nanpazi*¹; Panayiotis Tsakiroopoulos¹; ¹University of Sheffield



Mechanical Behavior at the Nanoscale II — Fatigue and Nanoindentation

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Thursday AM
February 20, 2014

Room: 9
Location: San Diego Convention Center

Session Chairs: Seung Min Han, Korea Advanced Institute of Science and Technology; Qian Yu, University of California Berkeley

8:30 AM

Lifetime and Damage Initiation of Micro-scale fcc Materials in the High and Very High Cycle Fatigue Regimes: *Thomas Straub*¹; Tobias Kennerknecht¹; Matthew Berwind¹; Christoph Eberl¹; ¹Fraunhofer Institute for Mechanics of Materials (IWM)

8:50 AM

Fatigue-induced Grain Coarsening and Its Influence on the Electromechanical Properties of Metal Films on Polyimide: *Megan Cordill*¹; Oleksandr Glushko²; ¹Erich Schmid Institute of Materials Science; ²Dept. Material Physics

9:10 AM

Quantitative In Situ TEM Study of Fatigue Crack Nucleation in Nanocrystalline Gold Thin Films: *Ehsan Hosseini*¹; Olivier Pierron¹; ¹Georgia Institute of Technology

9:30 AM

Impurity Strengthening of Nanocrystalline Thin Films by Controlling Stress-driven Grain Growth: *Suman Dasgupta*¹; Mo-Rigen He²; Saritha Samudrala³; Mingen Li¹; Julie Cairney³; Daniel Gianola²; Kevin Hemker¹; ¹Johns Hopkins University; ²University of Pennsylvania; ³University of Sydney

9:50 AM

Plastic Deformation of Bi-crystalline Micro Pillars Analyzed by In Situ μ Laue Diffraction: *Christoph Kirchlechner*¹; Peter Imrich²; Christian Motz³; Gerhard Dehm¹; ¹Max-Planck-Institut für Eisenforschung GmbH; ²University of Leoben; ³Universität des Saarlandes

10:10 AM Break

10:30 AM

Elastic Instabilities during Nanoindentation of Perfect Crystals: From Homogeneous Dislocation Nucleation to Diffuse Buckling: Akanksha Garg¹; *Craig Maloney*¹; ¹Carnegie Mellon University

10:50 AM

Variation in Nanoindentation Hardness of Platinum: *Michael Maughan*¹; David Bahr¹; ¹Purdue University

11:10 AM

Deformation Behaviour of Nanostructured Materials during Small Scale Testing: *Verena Maier*¹; Megan Cordill²; Daniel Kiener¹; ¹University of Leoben; ²Erich Schmid Institute of Materials Science

11:30 AM

On a Proper Account of Plastic Size Effects in Continuum Models Including the Flux of Dislocation Density: Christoph Kords¹; *Philip Eisenlohr*²; Franz Roters¹; ¹Max-Planck-Institut für Eisenforschung; ²Michigan State University

11:50 AM Invited

Mechanical Behaviors of Two Dimensional Materials: *Jun Lou*¹; ¹Rice University

Mechanical Behavior Related to Interface Physics II — Biphase Boundary Effects on Mechanical Response of Composites I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Nan Li, Los Alamos National Laboratory; Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Tonya Stone, Mississippi State University

Thursday AM
February 20, 2014

Room: 11A
Location: San Diego Convention Center

Session Chairs: Daniel Kiener, University of Leoben; Siddhartha Pathak, Los Alamos National Laboratory

8:30 AM

Hardness Versus Layer Thickness in Laminate Composites: *Anthony Rollett*¹; Irene Beyerlein²; Nathan Mara²; John Carpenter²; Richard Lesar³; ¹Carnegie Mellon University; ²Los Alamos National Laboratory; ³Iowa State University

8:50 AM Invited

Deformability of Ultrahigh Strength Metal-Ceramic Cu/TiN Nanolayered Composites: *Siddhartha Pathak*¹; William Mook¹; Jon Baldwin¹; Nathan Mara¹; Amit Misra¹; ¹Los Alamos National Laboratory

9:20 AM

The Influence of Interfacial Character on Shear Instability in Nanolamellar Composites: *Shijian Zheng*¹; Jian Wang¹; John Carpenter¹; William Mook¹; Patricia Dickerson¹; Irene Beyerlein¹; Nathan Mara¹; ¹Los Alamos National Laboratory

9:40 AM

Stacking Fault and Partial Dislocation Dominated Strengthening Mechanisms in Highly Textured Cu/Co Multilayers: *Yue Liu*¹; Youxing Chen¹; Kaiyuan Yu¹; Haiyan Wang¹; Xinghang Zhang¹; ¹Texas A&M University

10:00 AM Break

10:20 AM Invited

High Temperature Deformation Behavior and Modeling of Al/SiC Nanolaminates: Carl Mayer¹; Saeid Lotfian²; Nan Li³; J. Kevin Baldwin³; *Nikhilesh Chawla*¹; Nathan Mara; Amit Misra; Javier LLorca; Jon Molina-Aldareguia; ¹Arizona State University; ²IMDEA; ³Los Alamos National Laboratory

10:50 AM

X-ray Diffraction Studies of Forward and Reverse Plastic Flow in Nanoscale Layers during Thermal Cycling: *Michael Gram*¹; John Carpenter²; Andrew Payzant³; Amit Misra²; Peter Anderson¹; ¹Ohio State University; ²Los Alamos National Laboratory; ³Oak Ridge National Laboratory

11:10 AM

High-temperature Mechanical Properties of Physical Vapour-deposited and Accumulative Roll-bonded Cu/Nb Nanoscale Multilayers: *Jon Molina-Aldareguia*¹; Miguel Monclus¹; Irene Beyerlein²; Nathan Mara²; Tomas Polcar³; Javier LLorca¹; ¹IMDEA Materials Institute; ²Los Alamos National Laboratory; ³Czech Technical University in Prague

11:30 AM Invited

High Temperature Properties of Nanoscale Cu Based Composites and Foams: *Daniel Kiener*¹; Mladen-Mateo Primorac¹; Marius Kreuzeder¹; Verena Maier¹; Mario Stefanelli²; Anton Hohenwarter³; Manuel Abad⁴; Peter Hosemann⁴; ¹University of Leoben; ²Materials Center Leoben; ³Austrian Academy of Science; ⁴University of California Berkeley

Multiscale Approaches to Hydrogen-assisted Degradation of Metals — Overcoming HE in Service I / H Diffusion & Trapping

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

Program Organizers: Nicholas Winzer, Fraunhofer IWM; Matous Mrovec, Fraunhofer IWM; Brian Somerday, Sandia National Laboratories; Petros Sofronis, University of Illinois; David Bahr, Purdue University; Srinivasan Rajagopalan, ExxonMobil Research and Engineering Company

Thursday AM
February 20, 2014

Room: 11B
Location: San Diego Convention Center

Session Chairs: Srinivasan Rajagopalan, ExxonMobil Research and Engineering Company; Nicholas Winzer, Fraunhofer IWM

8:30 AM Invited

Analysis of Thermal Desorption Spectra for Ultra-high Strength Steel: *Oliver Rotl¹*; Thomas Lostak¹; Richard-George Thiessen¹; Ingo Thomas¹; ¹ThyssenKrupp Steel Europe AG

9:10 AM

Hydrogen Embrittlement in Pulse-plated Nickel Material of Liquid Propulsion Rocket Engines: *Torsten Sebal¹*; Georgios Paronis¹; Eggert Reese²; Wolfgang von Bestenbostel²; ¹Astrium Space Transportation; ²EADS Innovation Works

9:30 AM Break

9:50 AM Invited

On the Implication of Dislocations and Vacancies Distributions on Hydrogen Diffusion and Trapping in FCC Alloys: Grain-boundaries and Dislocation Patterns: *Xavier Feaugas¹*; Abdelali Oudriss¹; Arnaud Metsue¹; Catherine Savall¹; Jamaa Bouhattate¹; Juan Creus¹; ¹Université de La Rochelle

10:30 AM

Characterization of Hydrogen Traps in Steels Using Thermal Desorption Spectrometry (TDS): *Dakshina Valiveti¹*; Neeraj Thirumalai²; HyunWoo Jin¹; ¹ExxonMobil Research & Engineering; ²ExxonMobil Development Company

10:50 AM

A Review on the Influence of Metallurgical Parameters on the Diffusion and Trapping of Hydrogen in Quenched and Tempered Martensitic Steels: *Juan Creus¹*; Abdelali Oudriss¹; Stéphane Cohendoz¹; Cyril Berziou¹; Egle Conforto¹; Jamaa Bouhattate¹; Xavier Feaugas¹; ¹LaSIE

11:10 AM

Hydrogen Permeability in Zn-Ni and Al Coatings: *Sriraman Rajagopalan¹*; Salim Brahimi²; Stephen Yue¹; ¹McGill University; ²Ibaca Technologies Corp / McGill University

Multiscale Perspectives on Plasticity in HCP Metals — Mechanisms & Microstructures II

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

Program Organizers: Benjamin Morrow, Los Alamos National Laboratory; Suveen Mathaudhu; Ellen Cerreta, Los Alamos National Laboratory; Juan P. Escobedo, The University of New South Wales Canberra; Dallas Trinkle, University of Illinois, Urbana-Champaign

Thursday AM
February 20, 2014

Room: 6C
Location: San Diego Convention Center

Session Chairs: Suveen Mathaudhu; Benjamin Morrow, Los Alamos National Laboratory

8:30 AM Invited

Simulating the Evolution of Microtextured Regions during Hot Working of a Near-alpha Titanium Alloy: *Adam Pilchak¹*; Edwin Schwalbach¹; Joseph Tucker²; Christopher Szczepanski¹; Lee Semiatin¹; ¹Air Force Research Laboratory; ²Air Force Research Laboratory and UES, Inc.

8:50 AM

Deformation Twinning and Associated Stresses in HCP Materials: *M. Arul Kumar¹*; Carlos Tome¹; ¹Los Alamos National Laboratory

9:10 AM

The Effect of Temperature on the Deformation Mechanisms of a Zr Alloy: *Peter Honnibal¹*; Michael Preuss¹; *Joao Fonseca¹*; ¹The University of Manchester

9:30 AM

The {10-12} Extension Twinning in Mg: Variant Selection, Morphology, and Interaction with Slip Systems: *Yi Wang¹*; Hahn Choo¹; ¹University of Tennessee

9:50 AM Invited

Towards Understanding Shear and Shuffles during Compound Twinning in Hexagonal Close-packed Structures: *Mark Tschopp¹*; Haitham El Kadiri²; Christopher Barrett²; ¹Army Research Laboratory; ²Mississippi State University

10:10 AM Break

10:30 AM Invited

Micromechanics of Pure Magnesium from Atomistic and Continuum Crystal Plasticity Simulations: *Shailendra Joshi¹*; Balaji Selvarajou¹; ¹National University of Singapore

10:50 AM

Tensile Twinning Nucleation in Zr Coupled to Neighboring Slip Observed in 3D: *Jonathan Lind¹*; S.F. Li¹; Reeru Pokharel¹; Ulrich Lienert²; *Anthony Rollett¹*; Robert Suter¹; ¹Carnegie Mellon University; ²DESY

11:10 AM

Role of Deformation Twinning on Swift Effects in AZ31 Mg: *Nitin Chandola¹*; Oana Cazacu¹; Benoit Revil-Baudard¹; Ricardo Lebensohn²; ¹University of Florida; ²Los Alamos National Laboratory

11:30 AM

Experimental and Theoretical Investigation of Deformation and Damage in α -Titanium: *Philip Flater¹*; Nitin Chandola¹; Joel House²; Oana Cazacu¹; ¹University of Florida; ²AFRL



Nanoparticulate Materials: Production, Consolidation and Characterization — Particle Synthesis

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

Program Organizers: Brady Butler, U.S. Army Research Laboratory; Eugene Olevsky, San Diego State University

Thursday AM
February 20, 2014

Room: Carlsbad
Location: San Diego Marriott Marquis & Marina

Session Chair: Nitin Chopra, University of Alabama

8:30 AM Invited

Developing Surfactant-free Growth Approaches for Coating 1-D Nanostructures with Stable Dispersion of Nanoparticles: From Fundamentals to Applications: *Nitin Chopra*¹; ¹The University of Alabama

9:00 AM Invited

Sol-gel Synthesis NaCrSi₂O₆ Nanopigments Aided by Statistical Design of Experiments: *Oscar Restrepo*¹; Miguel Hernandez²; ¹National University of Colombia

9:30 AM

Synthesis of Ceramic Nanopigments: *Oscar Restrepo*¹; Edgar Chavarriaga¹; Camilo Restrepo¹; Juan Montoya²; ¹National University of Colombia; ²Corporación Universitaria Lasallista

9:50 AM Break

10:10 AM

Photochemical Synthesis and Characterization of Palladium @ Platinum Core-shell Composite Nanoparticles: Jiexiang Wang¹; Zhengfu Zhang¹; Enge Zhao¹; ¹Kunming University of Science and Technology

10:30 AM

Synthesis of Nano-shell ZnO Material with a Novel Joint Process of Ultrasonic Atomizing and Microwave Decomposition: *Lei Guo*¹; ¹Key Laboratory of Unconventional Metallurgy, Kunming University of Science and Technology

10:50 AM

Flame Spray Synthesis and Characterization of Nanocrystalline Alumina Particles: *Bobu Jolly*¹; Subramshu Bhattacharya¹; ¹Indian Institute of Technology Madras

11:10 AM

Preparing Nano-size SnO₂ by Spray Pyrolysis Deposition: *Chen Yuxiang*¹; Peng Jjinhui¹; ¹Kunming University of Science and Technology

Nanostructured Materials for Rechargeable Batteries and Supercapacitors II — Session VII

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: David Mitlin, University of Alberta and NINT NRC; Reza Shahbazian-Yassar, Michigan Technological University; Peter Kalisvaart, University of Alberta and NINT NRC

Thursday AM
February 20, 2014

Room: Ballroom F
Location: San Diego Marriott Marquis & Marina

Session Chairs: Jeff Sakamoto, Michigan State University; Yan Yao, University of Houston

8:30 AM Invited

Quantitative Operando Electrochemical TEM to Study Alloying for Advanced Battery Anodes: *Kevin Zavadil*¹; Yang Liu¹; Katherine Jungjohann¹; Paul Kotula¹; Nathan Hahn¹; ¹Sandia National Laboratories

8:45 AM Invited

Recent Advances towards Improvement of Electrochemical Flow Capacitors (EFCs): *Majid Beidaghi*¹; Kelsey Hatzell¹; Christopher Dennison¹; Muhammad Boota¹; Emin Kumbur¹; Yury Gogotsi¹; ¹Drexel University

9:00 AM Invited

Enhanced Electrical Capacitance and Energy Storage in Defect Induced Nanocarbons: *Prabhakar Bandaru*¹; ¹UC, San Diego

9:15 AM Invited

Garnet-based Ceramic Electrolyte: Enabling Li Metal Anodes and Solid State Batteries: *Jeff Sakamoto*¹; ¹Michigan State University

9:30 AM Invited

Metal hydrides: Relevant Materials for Lithium-ion Batteries Negative Electrodes: *Luc Aymard*¹; Warda Zaidi¹; Jean-pierre Bonnet¹; ¹LRCs UPJV

9:45 AM Invited

In Situ Synthesis of High-energy Cathodes for Lithium-ion Batteries: *Feng Wang*¹; LiPing Wang¹; Sung-Wook Kim¹; Xiaoya Wang¹; Jianming Bai¹; ¹Brookhaven National Laboratory

10:00 AM Break

10:15 AM Invited

Bonding, Structure and Properties of Energy Storage and Conversion Materials with Electron Microscopy: *Gianluigi Botton*¹; Nicolas Gauquelin¹; Hansuo Liu¹; Sagar Prabhudev¹; Samantha Stambula¹; ¹McMaster University

10:30 AM Invited

Nanoscale Investigation of Charge Dynamics in Electrochemical Supercapacitors Using Ionic Liquids: *Nina Balke*¹; ¹Oak Ridge National Laboratory

10:45 AM Invited

Ultra High Energy Density of Nanocomposite Capacitors: Haixiong Tang¹; Henry Sodano¹; ¹University of Florida

11:00 AM Invited

Multivalent Ion Intercalation Materials as Ultra-high Energy Battery Cathodes: *Yan Yao*¹; ¹University of Houston

11:15 AM Invited

Hydrothermal Synthesis and Characterization of Domino-shaped Li₄Ti₅O₁₂ Columns and Porous TiO₂(B) Nanorods as Anode Materials for Lithium-ion Batteries: *Vic Liu*¹; Xingcheng Xiao¹; Donjoon Ahn¹; Jung Hyun Kim¹; Michael Carpenter¹; Nicholas Pieczonka²; Misle Tessama¹; Nicole Ellison²; ¹General Motors; ²Optimal CAE Inc.

11:30 AM Invited

ALD TiO₂ Coated Silicon Nanowires for Lithium Ion Battery Anodes with Enhanced Cycling Stability and Coulombic Efficiency: *David Mitlin*¹; Elmira Lotfabad¹; Peter Kalisvaart¹; ¹University of Alberta and NINT NRC

11:45 AM Invited

Aqueous Synthesis of Mesoporous Cr³⁺/Nb⁵⁺ Doped Anatase TiO₂ for Application in Secondary Lithium-ion Batteries: *Yang Hao*¹; Chun-Kai Lan¹; Bing-Hong Chen¹; Jenq-Gong Duh¹; ¹National Tsing Hua University

12:00 PM

Electrodeposited Si-Al Thin Film as Anode for Li Ion Batteries: *Heng Wang*¹; Bing Li¹; Zuxin Zhao¹; ¹East China University of Science and Technology

Neutron and X-ray Studies of Advanced Materials VII: Challenges of the Future World — Plasticity and Deformation

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

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kostorz, ETH; Brent Fultz, California Institute of Technology; Peter Liaw, University of Tennessee

Thursday AM
February 20, 2014

Room: 10
Location: San Diego Convention Center

Session Chairs: Peter Liaw, University of Tennessee; Claire White, Princeton University

8:30 AM Invited

Stability of the Two-phase (α/ω) Microstructure of Shocked Zirconium: Donald Brown¹; Jon Almer²; Levente Balogh¹; Ellen Cerreta¹; Thomas Sisneros¹; ¹Los Alamos National Laboratory; ²Argonne National Laboratory

8:55 AM Invited

Structural Characterization of Complex Materials: Thomas Proffen¹; ¹Oak Ridge National Laboratory

9:20 AM

In Situ Diffraction Reveals Grain Size Dependence of Domain Wall Motion and Relation to Macroscopic Properties in BaTiO₃: Dipankar Ghosh¹; Jacob Jones²; Akito Sakata²; Jared Carter²; Hyuksu Han²; Juan Nino²; Pam Thomas³; ¹California Institute of Technology; ²University of Florida; ³University of Warwick

9:35 AM

Simulations and Experiments of Diffraction Peak Broadening Due to Misorientation in Silicon Single Crystals Deformed by Single Slip: Darren Pagan¹; Matthew Miller¹; ¹Department of Mechanical and Aerospace Engineering, Cornell University

9:50 AM

Unravelling the Origin of Enhanced Performance of Mg-Zn-Zr Alloy ZK60 by Means of Synchrotron Radiation and Electron Microscopy: Dmitry Orlov¹; Daniele Pelliccia²; Xiya Fang²; Laure Bourgeois²; Nigel Kirby³; Andrei Nikulin²; Kei Ameyama¹; Yuri Estrin²; ¹Ritsumeikan University; ²Monash University; ³Australian Synchrotron

10:05 AM Break

10:10 AM Invited

Environmental-temperature Effect on a Ductile High-entropy Alloy Investigated by In Situ Neutron-diffraction Measurements: E-Wen Huang¹; Chi Lee²; Dunji Yu³; Ke An⁴; Peter Liaw²; Jien-Wei Yeh²; ¹National Central University; ²National Tsing Hua University; ³Tianjin University; ⁴Oak Ridge National Laboratory; ⁵University of Tennessee

10:35 AM

In Situ Determination of Crystal Structure and Domain Character in Lead Free Piezoceramics: Keith Bowman¹; Chris Fancher²; Matthias Ehmke³; ¹Illinois Institute of Technology; ²North Carolina State University; ³Purdue University

10:50 AM

Formation of <210> Texture in a Cold Drawn Metastable Beta Ti Alloy: Song Cai¹; Jeremy Schaffer¹; Yang Ren²; ¹Fort Wayne Metals Research Products Corp.; ²Argonne National Laboratory

11:05 AM

Anisotropic Lattice Elastic/Plastic Strain Response in Laser Shock Peened Ti-6Al-4V Alloy: Yixiang Zhao¹; Yang Ren²; Seetha Mannava¹; Dong Qian³; Vijay Vasudevan¹; ¹University of Cincinnati; ²Argonne National Laboratory; ³University of Texas at Dallas

11:20 AM

Deformation Mechanisms of a 20Mn TWIP Steel Investigated with In Situ Neutron Diffraction and TEM: Yongfeng Shen¹; Yandong Wang¹; XiaoPeng Liu¹; Xin Sun¹; RuLin Peng¹; Peter K Liaw¹; Liang Zuo¹; ¹Northeastern University

11:35 AM

The Extended Tertiary Creep Stage and Its Relationship with the Diffusion around NiAl Precipitates in NiAl-Strengthened Ferritic Alloys: Zhiqian Sun¹; Shenyan Huang¹; Donald Brown²; Björn Clausen²; Gian Song¹; Gongyao Wang¹; Peter Liaw¹; ¹The University of Tennessee; ²The Los Alamos National Laboratory

11:50 AM

In Situ Neutron Powder Diffraction on Hydrogen Storage Materials: Roxana Flacau¹; Helmut Fritzsche¹; Jacques Huot²; ¹Canadian Neutron Beam Centre, NRC Canada; ²Université du Québec à Trois-Rivières

Pb-free Solders and Emerging Interconnect and Packaging Materials — Whiskering and Substrate Effects

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch Automotiv

Thursday AM
February 20, 2014

Room: 5B
Location: San Diego Convention Center

Session Chairs: Carol Handwerker, Purdue University; Fu Guo, Beijing University of Technology

8:30 AM

Localization of High Thermoelastic Stresses in SAC305 Solder Films Controlling Stress Relaxation via Recrystallization and Surface Defect Formation: Wei-Hsun Chen¹; Pylin Sarobol²; John Blendell¹; Carol Handwerker¹; ¹Purdue University; ²Sandia National Laboratories

8:50 AM

Mechanical and Whiskering Behaviors of Sn and Sn-Cu Systems during Thermal Cycling: Eric Chason¹; Fei Pei¹; ¹Brown University

9:10 AM

Whisker Formation on SAC305 Solder Assemblies: Polina Snugovsky¹; Stephan Stephan²; Zohreh Bagheri³; Eva Kosiba³; Marianne Romansky³; Jeffrey Kennedy³; ¹Celestica; ²BAE Systems; ³Celestica

9:30 AM

Inhibition of Whisker Formation by Uniform Intermetallic Layer: Hanwen Lin¹; Chih Chen¹; ¹National Chiao Tung University

9:50 AM

Tensile Behavior of Sn Whiskers by FIB Lift-out and MEMS Testing in an SEM: Sudhanshu Singh¹; Rohit Sarkar¹; Huxiao Xie¹; Carl Mayer¹; Jagannathan Rajagopalan¹; Nikhilesh Chawla¹; ¹Arizona State University

10:10 AM Break

10:30 AM

Using Applied Mechanical Stress to Understand Tin Whisker/Hillock Formation: Fei Pei¹; Eric Chason¹; ¹Brown University

10:50 AM

Whisker Evaluations in 3D Microbump Structures: George Vakanas¹; Bjorn Vandecasteele²; Joke De Messemaeker²; Geert Willems²; Antonio LaManna²; Fei Pei³; Eric Chason³; Fay Hua¹; Ingrid De Wolf²; ¹Intel Corporation; ²Imec; ³Brown University

11:10 AM

Testing of Indium Solder Joints Formed between Coated Germanium and Kovar Substrates: Oguzhan Okudur¹; Gökhan Demirci²; Ishak Karakaya¹; ¹Middle East Technical University; ²Aselsan Inc.

11:30 AM

Influence of the IMC Layer on Nucleation Undercooling of Beta-Sn in Solder Joints: Sergey Belyakov¹; Christopher Gourlay¹; ¹Imperial College London



Phase Transformation and Microstructural Evolution — Martensitic Phase Transformations and Functional Materials

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Thursday AM Room: 13
February 20, 2014 Location: San Diego Convention Center

Session Chairs: Daniel Coughlin, Los Alamos National Laboratory; Peter Anderson, The Ohio State University

8:30 AM

In Situ Observation of Phase Transformation of Powder Sintering from Ni/TiH₂ Using Neutron Diffraction: Gang Chen¹; Klaus-Dieter Liss²; Peng Cao¹; ¹The University of Auckland; ²Australian Nuclear Science and Technology Organisation

8:50 AM

Characterization of Thermal and Mechanical Behavior of NiTiHfAl Shape Memory Alloys: Derek Hsu¹; Oscar Figueroa¹; Michele Manuel¹; ¹University of Florida

9:10 AM

Modeling the Effects of H-phase Precipitation on Ni-Ti-Hf Shape Memory Alloys: Xiang Chen¹; Daniel Coughlin²; Fan Yang¹; Ronald Noebe³; Michael Mills¹; Peter Anderson¹; ¹The Ohio State University; ²Los Alamos National Laboratory; ³NASA Glenn Research Center

9:30 AM

Microstructural Evolution in NiTi Polycrystals Strained by Load Biased Thermal Cycling: Peter Anderson¹; Matthew Bowers¹; Limei Yang¹; Marc De Graef²; Michael Mills¹; ¹The Ohio State University; ²Carnegie Mellon University

9:50 AM

A Phase Field/Finite Element Model to Simulate Plasticity and Martensitic Phase Transformation in Shape Memory Alloys: Harshad Paranjape¹; Sivom Manchiraju¹; Peter Anderson¹; ¹The Ohio State University

10:10 AM Break

10:25 AM

Geometrical and Energetic Approaches to Pattern Formation during Cubic to Orthorhombic Martensitic Transformations in Shape Memory Alloys: Yipeng Gao¹; Yunzhi Wang¹; ¹The Ohio State University

10:45 AM

Low Temperature SEM Observations of the Martensitic Transformation in a AuCuZn Alloy: Michael Chapman¹; Xian Chen²; Richard James²; Marc De Graef¹; ¹Carnegie Mellon University; ²University of Minnesota

11:05 AM

Martensitic Transformations in CuAlMnNi Shape Memory Alloy Microwires: Nihan Tuncer¹; Christopher Schuh¹; ¹MIT

11:25 AM

Two-way Shape Memory Effect (TWSME) in a Cu-Al-Mn Shape Memory Alloy: Prathap Chandran¹; Vedamanikam Sampath²; ¹IRIS, Faculty of Engineering & Industrial Sciences; ²Indian Institute of Technology Madras

11:45 AM

Crystallographic Design of Ferroic Materials: Pathway Network Construction for Transformation and Deformation: Yipeng Gao¹; Suliman Dregia¹; Yunzhi Wang¹; ¹The Ohio State University

12:05 PM

Bulk Processing and Mechanical Properties of Ni₃Mo: Ibrahim Khalfallah¹; A. Aning¹; ¹Virginia Tech

Phase Transformation and Microstructural Evolution — Phase Transformations Induced by Irradiation I

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Thursday AM Room: 31B
February 20, 2014 Location: San Diego Convention Center

Session Chairs: Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Stuart Maloy, Los Alamos National Laboratory

8:30 AM Invited

Radiation-induced Phase Transformations in F-M and Austenitic Alloys at High Dose: Gary Was¹; Zhijie Jiao¹; ¹University of Michigan

9:00 AM Invited

Nano-scale Precipitate Evolution in Irradiated RPV Steels: Recent Progress in Understanding Late Blooming Phases: G. Robert Odette¹; Peter Wells¹; Takuya Yamamoto¹; ¹University of California Santa Barbara

9:30 AM

Irradiation and Temperature Induced Precipitation in Intermetallic Hardening Steels: Peter Hosemann¹; Christina Hofer²; Zijing Huang¹; Erich Stergar³; Djamel Kaoumi⁴; Stuart Maloy⁵; ¹UC Berkeley; ²Montanuniversitaet Leoben; ³SCK-CEN; ⁴University of South Carolina; ⁵Los Alamos National Laboratory

9:50 AM

Multiscale Characterization and Modeling of Precipitation in Ferritic Nano-reinforced Steels: Xavier Boulnat¹; Damien Fabrègue²; Michel Perez²; Sophie Cazottes²; Marie-Hélène Mathon³; Yann de Carlan¹; ¹CEA, DEN; ²INSA Lyon - MATEIS; ³Laboratoire Leon Brillouin

10:10 AM Break

10:25 AM Invited

Crystalline to Amorphous Phase Transformations under the Influence of Ion Irradiation: Robert Williams¹; Arda Genç²; Michael Presley¹; Brian Welk¹; Gopal Viswanathan¹; Daniel Huber¹; Wolfgang Windl¹; Hamish Fraser¹; ¹The Ohio State University; ²FEI Company

10:55 AM Invited

Phase Transformation in Nanostructured Ferritic Alloys: Michael Miller¹; ¹Oak Ridge National Laboratory

11:25 AM

Irradiation Induced Microstructural Changes in Nickel-molybdenum-chromium Alloys: Massey de los Reyes¹; Dhriti Bhattacharyya¹; Marquis Kirk²; Gregory Lumpkin¹; ¹Australian Nuclear Science and Technology Organisation (ANSTO); ²Argonne National Laboratory (ANL)

11:45 AM

Stability of Precipitates under Heavy Ion Irradiation in Fe-based Oxide Dispersion Strengthened (ODS) Steels and Ni-based Super Alloys: Osman Anderoglu¹; Jeff Aguiar¹; Emanuelle Marquis²; Yongqiang Wang¹; Blas Uberuaga¹; Stuart Maloy¹; ¹Los Alamos National Laboratory; ²University of Michigan

Phase Transformation and Microstructural Evolution — Processing and Microstructural Evolution II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Thursday AM
February 20, 2014

Room: 31C
Location: San Diego Convention Center

Session Chairs: Kester Clarke, Los Alamos National Laboratory; Paul Gibbs, Los Alamos National Laboratory

8:30 AM

Investigation of Twin Fraction in High Purity Nickel During Recrystallization: *Brian Lin*¹; Anthony Rollett¹; Gregory Rohrer¹; ¹Carnegie Mellon University

8:50 AM

Yield Strength Optimisation in a Polycrystalline Nickel-base Superalloy: *David Collins*¹; Howard Stone²; ¹University of Oxford; ²University of Cambridge

9:10 AM

Microstructural Aspects that Influence Thermal Coarsening in Nanotwinned Copper: *Thomas LaGrange*¹; Mukul Kumar¹; Bryan Reed¹; Jeremy Mason¹; Troy Barbee¹; Vasily Bulatov¹; Shiu Fai Frankie Li¹; ¹Lawrence Livermore National Laboratory

9:30 AM

A TEM Study on Graphite Crystals in Ti-alloyed Grey Cast Iron: Elham Moumeni¹; *Niels Tiedje*²; Flemming Grumsen²; Hilmar Danielsen²; Andy Horsewell²; Jesper Hattel²; ¹MAN Diesel & Turbo; ²Technical University of Denmark

9:50 AM

Relationship between Microstructural Evolution, Order-disorder Transformation and Plastic Inhomogeneities during Deformation of Beta Brass: Saud Saleem¹; *Mitra Basirar*¹; Hasse Fredriksson¹; ¹Division of Casting of Metals, Department of Material Science and Engineering, KTH, Sweden

10:10 AM Break

10:25 AM

Transformation Reactions Induced by Cold Rolling: *Zhe Wang*¹; John Perepezko¹; ¹University of Wisconsin-Madison

10:45 AM

Changes in Vibrational Entropy in Cu-Fe: *Hillary Smith*¹; Billy Hornbuckle²; Gregory Thompson²; Brent Fultz¹; ¹California Institute of Technology; ²University of Alabama

11:05 AM

Influence of Oxygen and Cold Deformation on the α' Phase Formation in Gum Metal: *Jian Zhang*¹; *Cem Tasan*¹; Minjie Lai¹; Hauke Springer¹; Dierk Raabe¹; ¹Max-Planck-Institut für Eisenforschung GmbH

11:25 AM

Effect of Intercritical Annealing on Phase Transformation and Mechanical Properties of Thermo-mechanically Processed Dual Matrix Ductile: *Mohamed Soliman*¹; Hossam Ibrahim¹; Adel Nofal²; Heinz Palkowski¹; ¹Institute of Metallurgy - Clausthal University of Technology; ²Central Metallurgical Research and Development Institute - CMRDI

11:45 AM

Influence of Athermal Mechanisms on Phase Transformations in Al-Cu: *Rémy Besson*¹; Ludovic Thuinet²; Jaeyoung Kwon²; Marie-Noëlle Avettand-Fénoël²; Alexandre Legris²; ¹CNRS - Unité Matériaux et Transformations - Université de Lille; ²Unité Matériaux et Transformations - Université de Lille

12:05 PM

Aberration-corrected S/TEM Imaging and Density Functional Theory-based Models of Pt/Alumina Interfaces: *Melissa Santala*¹; Colin Ophus²; Mark Asta²; Velimir Radmilovic⁴; ¹Lawrence Livermore National Laboratory; ²Lawrence Berkeley National Laboratory; ³University of California, Berkeley; ⁴University of Belgrade

Radiation Effects in Oxide Ceramics and Novel LWR Fuels — Effects of Radiation on Thermal and Mechanical Properties of Ceramic Oxide Fuels

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

Program Organizers: Xian-Ming Bai, Idaho National Laboratory; Todd Allen, Idaho National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Jianliang Lin, Colorado School of Mines; Michele Manuel, University of Florida; Dragos Staicu, European Commission, Joint Research Centre, Institute for Transuranium Elements; Yong Yang, University of Florida

Thursday AM
February 20, 2014

Room: 33B
Location: San Diego Convention Center

Funding support provided by: The Center for Materials Science of Nuclear Fuel (CMSNF), an Energy Frontier Research Center led by the Idaho National Laboratory

Session Chairs: Thierry Wiss, European Commission - JRC -ITU; Michele Manuel, University of Florida

8:30 AM Invited

Understanding Nuclear Fuel Thermal Conductivity from Phonons in UO₂:

*Judy Pang*¹; Aleksandr Chernatynsky²; William Buyers³; Bennett Larson¹; Simon Phillpot²; ¹Oak Ridge National Laboratory; ²University of Florida; ³National Research Council Canada

9:00 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

9:20 AM

Impact of Nano-pores on the Fuel Thermal Conductivity: *Dragos Staicu*¹; Sergii Nichenko¹; ¹European Commission, Joint Research Centre, Institute for Transuranium Elements

9:40 AM

Mechanical Behavior of UO₂ under Irradiation: A Molecular Dynamics Study: Paul Fossati¹; *laurent Van Brutzel*¹; ¹CEA

10:00 AM Break

10:30 AM Invited

Thermal Conductivity, Microstructure and Gas Release from a 44 GWd/t MOX Fuel: *Thierry Wiss*¹; Dragos Staicu¹; Ondrej Benes¹; Jean-Yves Colle¹;

Dimitrios Papaioannou¹; Rudy Konings¹; Vincenzo Rondinella¹; Akihiro Sasahara²; Takeshi Sonoda²; ¹European Commission - JRC -ITU; ²CRIEPI

11:00 AM

Misorientation-dependence of Grain Boundary Thermal Resistance in CeO₂: *Xian-Ming Bai*¹; Aleksandr Chernatynskiy²; Jian Gan¹; ¹Idaho National Laboratory; ²University of Florida

11:20 AM

Molecular Dynamics Simulations of the Effect of Point Defects and Embedded Xe Atoms on Thermal Transport in Uranium Oxide: *Zhi-Gang Mei*¹; Marius Stan¹; ¹Argonne National Laboratory

11:40 AM

Radiation Effects in UO₂: *Lingfeng He*¹; Billy Valderrama²; Mahima Gupta¹; Janne Pakarinen¹; Jian Gan³; Marquis Kirk⁴; Andrew Nelson⁵; Michele Manuel²; Todd Allen¹; ¹University of Wisconsin-Madison; ²University of Florida; ³Idaho National Laboratory; ⁴Argonne National Laboratory; ⁵Los Alamos National Laboratory



Recycling and Sustainability Update — Recycling

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee
Program Organizers: Randolph Kirchain, Massachusetts Institute of Technology; Jeff Spangenberg, Argonne National Laboratory

Thursday AM Room: 16B
February 20, 2014 Location: San Diego Convention Center

Session Chairs: Jeffrey Spangenberg, Argonne National Laboratory; Randolph Kirchain, Massachusetts Institute of Technology

8:30 AM Award Presentation: Light Metals Subject Best Paper – Recycling

8:40 AM

Sustainably Designed Epoxy Nano-composites for Improved E-Waste Processing and Recycling: *John Howarter*¹; Alexandra Bruce¹; Gamini Mendis¹; Inez Hua¹; Jeffrey Youngblood¹; ¹Purdue University

9:00 AM

Challenges to the Biotechnological Recycling of Precious and Rare Metals Sourced from Post-consumer Products: Norizo Saitoh¹; *Yasuhiro Konishi*¹; ¹Osaka Prefecture University

9:20 AM

Development of New Process for Recovering PGMs from Autocatalyst Scrap: *Akinari Suzue*¹; Yu-ki Taninouchi²; Toru Okabe²; ¹Department of Materials Engineering, Graduate School of Engineering, The University of Tokyo; ²Institute of Industrial Science, The University of Tokyo

9:40 AM

Zinc Vapor Pretreatment for Acid Leaching of Precious Metals from Automotive Catalyst Converters: *Hideaki Sasaki*¹; Masafumi Maeda¹; ¹Institute of Industrial Science, The University of Tokyo

10:00 AM Break

10:20 AM Invited

Sustainable Recycling of Solid Wastes via in-Process Separation: *Naiyang Ma*¹; ¹ArcelorMittal

10:40 AM

A Novel Recyclable Process for Producing Metal Sulfide Nanocrystals: *Hanan Alchaghouri*¹; John Thomas²; Paul O'Brien¹; ¹Manchester University; ²Bangor University

11:00 AM

Recovery of Valuable Metals from Lead Flue Dust by a Integrated Process: Xie Yang¹; *Hongxu Li*¹; Chao Li¹; Yuyue Wang¹; ¹University of Science and Technology

11:20 AM

Recycling of Valuable Metals from Poly Cracker Ash of Printed Circuit Boards (PCBs) by Physical Beneficiation and Hydrometallurgical Treatment: *Vinod Kumar*¹; Anjan Kumari¹; Manis Jha¹; Ari Vidyadhar¹; B.K. Soni²; ¹CSIR-National Metallurgical Laboratory; ²Eco Recycling Company Limited

11:40 AM

Recovery of Metal Values from Pre-concentration of Coarser Size Fraction of Printed Circuit Boards by Froth Flotation: *Vidyadhar Ari*¹; ¹CSIR - National Metallurgical Laboratory

Shape Casting: 5th International Symposium — Mechanical Properties

Sponsored by: TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS: Aluminum Committee, TMS: Solidification Committee
Program Organizers: Murat Tiryakioglu, University of North Florida; John Campbell, University of Birmingham; Glenn Byczynski, Nemak Canada

Thursday AM Room: 17B
February 20, 2014 Location: San Diego Convention Center

Session Chair: To Be Announced

8:30 AM

Metallurgy without Bilfilms; Fracture-free Plastic Deformation: *John Campbell*¹; ¹University of Birmingham

8:50 AM

Correlation between Bilfilm Index and Toughness of Aluminum Alloys: *Derya Dispinar*¹; Cem Kahraman¹; John Campbell²; ¹Istanbul University; ²University of Birmingham

9:10 AM

Impact of Section Thickness on the Microstructure and Mechanical Properties of Semi-solid Castings: *Stephen Midson*¹; Youfeng He²; Xiaogang Hu²; Daquan Li²; Fan Zhang²; Qiang Zhu²; ¹The Midson Group; ²General Research Institute for Non-Ferrous Metals

9:30 AM

The Relationship between Elongation and Fatigue Life in A206 Aluminum Castings: *Murat Tiryakioglu*¹; ¹University of North Florida

9:50 AM

Magnesium Casting Processes: The HIMAC Project Re-assessed: John Campbell¹; *Murat Tiryakioglu*²; ¹University of Birmingham; ²University of North Florida

10:10 AM Break

10:25 AM

Manufacturing Cost Modeling of Castings Produced with CRIMSON Process: *Binxu Zeng*¹; Mark Jolly¹; ¹Cranfield University

10:45 AM

On Weibull Mixtures in Mechanical Properties of Castings: *Murat Tiryakioglu*¹; ¹University of North Florida

11:05 AM

Microstructure and Mechanical Properties of Automotive Components Die Cast with Secondary Al alloys by SEED Semi-solid Process: *Giulio Timelli*¹; Stefano Capuzzi¹; Stefano Ferraro¹; Alberto Fabrizi¹; Leonardo Capra²; ¹University of Padua; ²Raffineria Metalli Capra

11:25 AM

The Effect of Grain Structure on Casting Durability Assessment in Al-Si Alloys: *Glenn Byczynski*¹; Robert Mackay¹; ¹Nemak Canada

11:45 AM

Near-net-shape Processing of 2024 Aluminium Alloy by SIMA Method: *Huseyin Ozdes*¹; Ilker Erdeniz¹; Eray Erzi¹; Derya Dispinar¹; ¹Istanbul University

Solar Cell Silicon — Silicon Refining I

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Conversion and Storage Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Gabriella Tranell, Norwegian University of Science & Technology; Yulia Meteleva-Fischer, Materials Innovation Institute M2i; Arjan Cifjja, SINTEF; Shadia Ikhmayies, Al Isra University

Thursday AM
February 20, 2014

Room: Balboa
Location: San Diego Marriott Marquis & Marina

Session Chairs: Yulia Meteleva-Fischer, Materials Innovation Institute M2i; Gabriella Tranell, Norwegian University of Science & Technology

8:30 AM

Kinetic Model for Gaz-liquid Extraction of Boron from Solar Silicon: The Role of Hydrogen: *Yves Delannoy*¹; Guy Chichignoud¹; Mathieu Vadon¹; ¹Grenoble University, SIMaP

8:55 AM

Boron Removal from Silicon by Humidified Gases: *Jafar Safarian*¹; Kai Tang¹; Kjetil Hildal²; Gabriella Tranell³; ¹SINTEF; ²ELKEM AS; ³Norwegian University of Science and Technology

9:15 AM

Boron Removal from Silicon Melts by H₂O/H₂ Gas Blowing – Gas-phase Mass Transfer: *Øyvind Sortland*¹; Merete Tangstad¹; ¹NTNU

9:35 AM

Thermodynamic Database and Kinetic Solidification Model of the Si-Ca-Fe System for Refining Metallurgical Grade Silicon: *In-Ho Jung*¹; Senlin Cui¹; Manas Paliwal¹; ¹McGill University

9:55 AM

Removal of Phosphor in Metallurgical Silicon by Rare Earth Elements: *Kai Tang*¹; Ole Løvvik¹; Jafar Safarian¹; Merete Tangstad²; ¹SINTEF Materials and Chemistry; ²Norwegian University of Science and Technology

10:15 AM Break

10:35 AM

Enabling Thin Silicon Technologies for Next Generation Low-cost c-Si Photovoltaics Systems: *Arief Budiman*¹; Alexander Caldwell²; Christophe Bonelli³; David Verstraeten³; Martin Kunz⁴; Nobumichi Tamura⁴; ¹Singapore University of Technology & Design (SUTD); ²SunPower Corporation; ³TOTAL; ⁴Advanced Light Source (ALS)

10:55 AM

Novel Effects on the Fracture Strength of Silicon Wafers for the Photovoltaic Industry: *Tania Vodenitcharova*¹; Oscar Borrero-López²; Mohamad Qadir¹; Mark Hoffman¹; ¹The University of New South Wales; ²Universidad de Extremadura

11:15 AM

Effect of Grain Orientation and Cooling Rate on Stress Distribution in a Small Scale Silicon Ingot: *Sylvain Gouttebroze*¹; Antoine Autruffe²; Lars Martin Sandvik Aas²; Morten Kildemo²; Xiang Ma¹; ¹SINTEF; ²NTNU

11:35 AM

Thermodynamic Behavior and Morphology of Impurities in Solidification from a Si–Al Melt for the Refining of Silicon: *Panpan Wang*¹; Huimin Lu¹; Zhijiang Gao¹; ¹Beihang University

11:55 AM

Magnetically Guided Shaping for Solar Cell Silicon Applications: *Chulmin Choi*¹; Tae Kyoung Kim¹; Sungho Jin¹; ¹University of California, San Diego

Solid-state Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment — Grain Boundaries I

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Xiang-Yang Liu, Los Alamos National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Stephen Foiles, Sandia National Labs; Mitra Taheri, Drexel University; Rampi Ramprasad, University of Connecticut

Thursday AM
February 20, 2014

Room: 4
Location: San Diego Convention Center

Session Chair: Stephen Foiles, Sandia National Laboratories

8:30 AM

Atomic-scale Observations of Grain Boundary Structure in Bismuth Telluride: *Douglas Medlin*¹; Nancy Yang¹; Kristopher Erickson¹; Michael Siegal¹; Graham Yelton¹; Steven Limmer¹; ¹Sandia National Laboratories

8:50 AM

Atomic Mechanisms of Interface Motion in Gold Bicrystals: *Ulrich Dahmen*¹; Abhay Gautam¹; Colin Ophus¹; Tamara Radetic²; Velimir Radmilovic²; Frederic Lancon³; ¹LBL; ²U. Belgrade; ³CEA

9:10 AM

Characterization of Atomic Relaxations at Grain Boundaries in Au Using Aberration-corrected Electron Microscopy: *Abhay Gautam*¹; Colin Ophus¹; Frédéric Lançon²; Velimir Radmilovic²; Ulrich Dahmen¹; ¹Lawrence Berkeley National Laboratory; ²Laboratoire de Simulation Atomistique (L_Sim); ³University of Belgrade

9:30 AM

Characterizations of Various Dislocations Present at or near a Σ3[-110]/(-1-11) Grain Boundary of Aluminum by High Resolution Electron Microscopy: *Mohammad Shamsuzzoha*¹; ¹University of Alabama

9:50 AM

High Throughput Quantification of Grain Boundary Segregation by Correlative Transmission Electron Microscopy and Atom Probe Tomography: *Michael Herbig*¹; Dirk Raabe¹; Stefan Zaefferer¹; Pyuck-Pa Choi¹; Yujiao Li¹; Shoji Goto¹; ¹Max-Planck-Institut für Eisenforschung GmbH

10:10 AM Break

10:20 AM Invited

High Temperature Grain Boundary Phase Transformations Induced by Point Defects: T. Frolov¹; D. L. Olmsted¹; M. Asta¹; *Y. Mishin*²; ¹University of California, Berkeley; ²George Mason University

11:00 AM

Examination of the Full Grain Boundary Character on Radiation Induced Segregation and Defect Denuded Zones in 316L and Ni-Cr Model Alloy: *Christopher Barr*¹; Kinga Unocic²; Khalid Hattar³; Xian-Ming Bai⁴; Mitra Taheri¹; ¹Drexel University; ²Oak Ridge National Laboratory; ³Sandia National Laboratories; ⁴Idaho National Laboratory

11:20 AM

Effect of Ge on Atomic Structure and Mobility of Grain Boundaries in Au Bicrystal Thin Films: *Tamara Radetic*¹; Abhay Gautam²; Colin Ophus²; Ulrich Dahmen²; ¹University of Belgrade; ²National Center for Electron Microscopy, LBNL

11:40 AM

Diffusion and Segregation of Ag in Cu near Special Grain Boundaries: *Sergii Divinsky*¹; Henning Edelhoff¹; ¹University of Münster



Solidification in Additive Manufacturing — Session I: Material Behavior in AM Powder Bed Systems

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS; Solidification Committee, TMS/ASM: Phase Transformations Committee
Program Organizers: Jyoti Mazumder, University of Michigan; Rainer Hebert, University of Connecticut; James Sears, GE GRC; Iver Anderson, Ames Laboratory; Alan Luo, The Ohio State University

Thursday AM
February 20, 2014

Room: 15B
Location: San Diego Convention Center

Session Chair: Rainer Hebert, University of Connecticut

8:30 AM Introductory Comments

8:35 AM Invited

A Comparison of the Behavior of a CoCrMo Alloy Solidified by Direct Metal Laser Melting (DMLM) and Electron Beam Melting (EBM) Additive Manufacturing Techniques: *James Sears*¹; Michael Gigliotti¹; Sirkanth Kottilingam²; Attila Szabo²; ¹GE GRC; ²GE - Power & Water

9:00 AM

Process Mapping of Melt Pool Geometry and Microstructure for Direct Metal Additive Manufacturing: *Jack Beuth*¹; Jason Fox¹; Joy Gockel¹; Colt Montgomery¹; Rui Yang¹; Haipeng Qiao¹; Amin Anvari¹; Sneha Narra¹; Kristen Hauser¹; Nathan Klingbeil²; ¹Carnegie Mellon University; ²Wright State University

9:20 AM

Effect of Laser Scanning Pattern and Build Direction in Additive Manufacturing on Anisotropy, Porosity and Residual Stress: *Amanda Wu*¹; Mary LeBlanc¹; Mukul Kumar¹; Gilbert Gallegos¹; Donald Brown²; Wayne King¹; ¹Lawrence Livermore National Laboratory; ²Los Alamos National Laboratory

9:40 AM

Reduction in Mechanical Anisotropy through High Temperature Heat Treatment of Hastelloy X Processed by Selective Laser Melting (SLM): *Thomas Etter*¹; Karsten Kunze²; Fabian Geiger¹; Hossein Meidani¹; ¹Alstom (Switzerland) Ltd; ²ETH Zurich (EMEZ)

10:00 AM Break

10:15 AM

Selective Laser Sintering of Modified 431D Al Alloy: Ryan Chou¹; Jason Milligan¹; Paul Bishop²; *Mathieu Brochu*¹; ¹McGill University; ²Dalhousie University

10:35 AM

Microstructure of Titanium Alloy Prepared by Selective Laser Melting in Vacuum: *Naoko Sato*¹; Shizuka Nakano¹; Toru Shimizu¹; Masashi Hagiwara²; Masahiro Sassa²; Kunio Matsuzaki¹; ¹National Institute of Advanced Industrial Science and Technology Japan; ²ASPECT Inc.

10:55 AM

Solidification Characteristics and Microstructural Features of Titanium Alloys Fabricated by Electron Beam Selective Melting: *Shenglu Lu*¹; M. Qian²; Huiping Tang³; D.H. St John²; ¹School of Materials and Metallurgy, Northeastern University; ²The University of Queensland, School of Mechanical and Mining Engineering, ARC Centre of Excellence for Design in Light Metals; ³State Key Laboratory of Metal Porous Material, Northwest Institute for Nonferrous Metal Research

Symposium on High Entropy Alloys II — Structures and Mechanical Properties

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Alloy Phases Committee
Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; M. C. Gao, National Energy Technology Laboratory; S. N. Mathaudhu

Thursday AM
February 20, 2014

Room: 5A
Location: San Diego Convention Center

Session Chairs: Oleg Senkov, UES, Inc.; Rajiv Mishra, University of North Texas

8:30 AM Invited

On the Exceptional Fracture Toughness Behavior of a High-entropy Iron-containing Alloy at Cryogenic Temperatures: Bernd Gludovatz¹; D. Catoor²; Easo George²; *Robert Ritchie*³; ¹Lawrence Berkeley National Laboratory; ²Oak Ridge National Laboratory; ³University of California Berkeley

8:50 AM

Microstructural Characterization and Mechanical Properties of Laser Deposited High Entropy Alloys: *Harihar Sista*¹; Joseph Newkirk¹; Frank Liou¹; ¹Missouri University of Science and Technology

9:00 AM Invited

The Influence of Cu and Al on the Microstructure, Mechanical Properties and Deformation Mechanisms in the High Entropy Alloys CrCoNiFeCu, CrCoNiFeAl_{1.5}, and CrCoNiFeCuAl_{1.5}: Brian Welk¹; Babu Viswanathan¹; Mark Gibson²; Peter Liaw³; *Hamish Fraser*¹; ¹The Ohio State University; ²CSIRO; ³The University of Tennessee

9:20 AM Invited

Ultra Grain Refinement in High Entropy Alloys: *Nobuhiro Tsuji*¹; Ikuto Watanabe¹; Nokeun Park¹; Daisuke Terada¹; Akinobu Shibata¹; Yoshihiko Yokoyama²; Peter Liaw³; ¹Kyoto University; ²Tohoku University; ³University of Tennessee

9:40 AM Invited

Effect of Aluminum Addition on the Microstructure and Properties of Refractory High Entropy Alloys: *Oleg Senkov*¹; Christopher Woodward¹; Jonathan Miller¹; ¹Air Force Research Laboratory, Materials and Manufacturing Directorate

10:00 AM

Nanostructure Evolution through High-pressure Torsion and Recrystallization in a High-entropy CrMnFeCoNi Alloy: *Nokeun Park*¹; Akinobu Shibata¹; Daisuke Terada¹; Yoshihiko Yokoyama²; Peter Liaw³; Nobuhiro Tsuji¹; ¹Kyoto University; ²Tohoku University; ³University of Tennessee

10:10 AM Break

10:30 AM Invited

High Strength and Tensile Ductility of a Face-centered-cubic High-entropy Alloy: F. Otto¹; A. Dlouhy²; Ch. Somsen³; H. Bei³; G. Eggeler³; *E. P. George*¹; ¹Oak Ridge National Laboratory; ²Institute of Physics of Materials; ³Ruhr-Universitaet Bochum

10:50 AM

Stacking Fault Energies and Mechanical Properties of FCC High Entropy Alloys: *Alexander Zaddach*¹; Changning Niu¹; Khaled Youssef¹; Douglas Irving¹; Carl Koch¹; ¹North Carolina State University

11:00 AM Invited

Vibrational Entropy in Metallic Alloys: *Brent Fultz*¹; ¹California Institute of Technology

11:20 AM

On the Deformation Mechanisms of a Refractory High-entropy Alloy: *Jean-Philippe Couzine*¹; Ivan Guillot¹; Guy Dirras²; Thierry Chauveau²; Philippe Djemia²; Loïc Perriere¹; Yannick Champion¹; ¹CNRS/UPEC; ²CNRS/University Paris 13

11:30 AM Invited

Mechanical Behavior of an Al_{0.1}CoCrFeNi High Entropy Alloy: Mageshwari Komarasamy¹; Nilesh Kumar¹; Zhi Tang²; *Rajiv Mishra*¹; Peter Liaw²; ¹University of North Texas; ²The University of Tennessee

11:50 AM

Structure and Properties of Refractory High-entropy Alloys: *Soumyadipta Maiti*¹; Walter Steurer²; ¹ETH Zurich; ²ETH Zurich

Ultrafine Grained Materials VIII — Equal Channel Angular Processing Studies

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Laverna, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Thursday AM

Room: 6E

February 20, 2014

Location: San Diego Convention Center

Session Chairs: Terry Langdon, University of Southern California; Laszlo Toth, Université de Lorraine

8:30 AM Invited

Cryogenic ECAP of CP Titanium: Microstructure and Properties: *Rimma Lapovok*¹; Hoi Pang Ng¹; Alexey Podolskiy²; Elena Tabachnikova²; Igor Psaruk²; ¹Monash University; ²B. Verkin Institute for Low Temperature Physics & Engineering

8:50 AM

Microstructure Evolution of the Recycled Ti-alloys Using Equal Channel Angular Pressing (ECAP): *Qi Shi*¹; ¹Loughborough University

9:05 AM

Dynamic Phase Transformation and Nonlinear Elasticity Phenomena in an Ultra-fine-grained TiNbTaZr Alloy: *Baolong Zheng*¹; Yitian Wang¹; Troy Topping¹; Yizhang Zhou¹; Ruslan Valiev²; Enrique Laverna¹; ¹University of California, Davis; ²Ufa State Aviation Technical University

9:20 AM

ECAP-conform as an Advanced Technique to Produce Ultrafine-grained Metals: *Georgy Raab*¹; Arseniy Raab¹; Elvira Fakhretdinova¹; ¹Ufa State Aviation Technical University

9:35 AM

The Dynamic Compressive Behavior at Elevated Temperatures of Ultrafine-grained Pure Ti Processed by ECAP: *Liu Wang*¹; Ying Chun Wang¹; Alexander V Korznikov²; Shu Kui Li¹; Alexander P Zhilyaev³; Elena Korznikova²; Haibo Jin¹; Terence G Langdon³; ¹School of Materials Science and Engineering, Beijing Institute of Technology; ²Institute for Problems of Metals Superplasticity, Russian Academy of Sciences; ³Materials Research Group, Faculty of Engineering and the Environment, University of Southampton

9:50 AM Invited

Microstructure Evolution Features of FCC Metals during Equal Channel Angular Pressing and Subsequent Annealing: *Jing Tao Wang*¹; ¹Nanjing University of Science and Technology

10:10 AM Break

10:25 AM Invited

Microstructure and Mechanical Behavior of the Nanostructured SUS316L Steel: An Overview: *Alexei Vinogradov*¹; Shingo Hayashi²; Yoshihisa Kaneko²; ¹Togliatti State University; ²Osaka City University

10:45 AM

Effect of Boundary Character on the Strength and Ductility of Ultrafine-grained Al-Zn alloy: Hung-Ya Liao¹; I-Shan Lee¹; *Pei-Ling Sun*²; Po-We Kao¹; ¹National Sun Yat-Sen University; ²Feng Chia University

11:00 AM Invited

Transformation of Lamellar Structures during Equal Channel Angular Pressing: Cameron Barr¹; Daniel McDonald¹; *Kenong Xia*¹; ¹University of Melbourne

11:20 AM

Creep in Ultrafine-grained Materials after Pressurization Treatment: *Vaclav Sklenicka*¹; Jiri Dvorak¹; Vladimir Betekhtin²; Andrey Kadomtsev²; Sergey Dobatkin²; Petr Kral¹; Marie Kvapilova¹; Milan Svoboda¹; ¹Institute of Physics of Materials, Academy of Sciences of the Czech Republic; ²Russian Academy of Sciences

11:35 AM

Nanocrystalline NiTiPd Shape Memory Alloys: *Thomas Waitz*¹; Peter Schindler²; Michael Kerber¹; Vijay Srivastava³; Richard James³; ¹University of Vienna; ²Stanford University; ³University of Minnesota

Ultrafine Grained Materials VIII — Roll Processing Studies

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Laverna, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Thursday AM

Room: 6F

February 20, 2014

Location: San Diego Convention Center

Session Chairs: Heinz Werner Höppel, University Erlangen-Nürnberg; R Jayaganathan, Indian Institute of Technology Roorkee

8:30 AM Invited

Deformation Behavior of Laminates and Bimodal Ultrafine Grained Microstructures: *Mathias Göken*¹; Heinz-Werner Höppel¹; ¹Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

8:50 AM Invited

Ti/Al Laminates Produced by ARB: *Werner Skrotzki*¹; Juliane Scharnweber¹; Andy Eschke¹; Carl-Georg Oertel¹; Jan Romberg²; Tom Marr²; Jens Freudenberger²; Ludwig Schultz²; Ilya Okulov²; Uta Kühn²; Jürgen Eckert²; ¹TU Dresden; ²IFW Dresden

9:10 AM

Creep Behavior of Particle Reinforced Aluminum Processed by Accumulative Roll Bonding: *Christopher Schunk*¹; Christian Schmidt¹; Heinz Werner Höppel¹; Mathias Göken¹; ¹University Erlangen-Nürnberg

9:25 AM

How Does Upscaling of the Accumulative Roll Bonding Process Affect the Homogeneity and Mechanical Properties of AA1050A: *Mathis Ruppert*¹; Wolfgang Böhm²; Hung Nguyen²; Heinz Werner Höppel¹; Marion Merklein²; Mathias Göken¹; ¹Department of Materials Science and Engineering, Institute I: General Materials Properties/ University of Erlangen-Nürnberg; ²Department of Mechanical Engineering, Institute of Manufacturing Technology

9:40 AM Invited

Tailored Grain Size of Bulk NiTi Achieved by Deformation Induced Amorphization and Subsequent Crystallization: *Martin Peterlechner*¹; Thomas Waitz²; Gerhard Wilde¹; ¹University of Muenster; ²University of Vienna

10:00 AM Break

10:15 AM Invited

Fully Recrystallized Nanostructures in Bulk Austenitic Steels: *Nobuhiro Tsuji*¹; Rajib Saha¹; Shuai Chen¹; Rintaro Uejii²; Akinobu Shibata¹; Si Gao¹; Daisuke Terada¹; ¹Kyoto Univ; ²Osaka University

10:35 AM Invited

Structure and Mechanical Properties of Nanostructured Al-0.3%Cu Alloy: Aneela Wakeel¹; *Tianlin Huang*¹; Guilin Wu¹; Xiaoxu Huang²; ¹Chongqing University; ²DTU National Laboratory for Sustainable Energy



10:55 AM

Mechanical Behaviour of Ultrafine Grained Zircaloy-2: Jayaganthan R¹; Sunkulp Goel¹; Nachiket Keskar¹; Indra Vir Singh¹; Dinesh Srivastava¹; Dey G.K¹; Saibaba N¹; ¹IIT Roorkee

11:10 AM

Tensile Instability of Nanostructured Al-1%Si Alloy: Tianlin Huang¹; Chao Li¹; Guilin Wu¹; Qing Liu¹; Xiaoxu Huang²; ¹Chongqing University; ²Technical University of Denmark

11:25 AM

Effect of Rolling on Microstructure and Mechanical Properties of Equal-channel Angular Pressed Mg-Gd-Zn-Zr Alloy: Jinghua Jiang¹; Jing Chen¹; Fumin Lu¹; Aibin Ma¹; Dan Song¹; Donghui Yang¹; Liuyan Zhang¹; Jiangqing Chen¹; ¹Hohai University

2014 Functional Nanomaterials: Synthesis, Properties and Applications — Applications of Nanomaterials II & Energy Nanomaterials

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Nanomaterials Committee

Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Thursday PM

February 20, 2014

Room: Ballroom D

Location: San Diego Marriott Marquis & Marina

Session Chairs: Nitin Chopra, The University of Alabama; Ramki Kalyanaraman, University of Tennessee; Yuanbing Mao, University of Texas, Pan American

2:00 PM

The Research of Photocatalytic Degradation Kinetics of Methyl Orange with the Magnesium Hydroxide /Titanium Dioxide Composite Powder: Ting Li¹; Bo Meng²; ¹Northeastern University; ²Shenyang University of Chemical Technology

2:15 PM

Arsenic Removal from Aqueous Solutions Using Nano-structured Calcium Silicate: Ozgul Taspinar¹; Tuba Yesilyaprak¹; Ilker Yavas¹; Unzile Yenial¹; Gulay Bulut¹; ¹Istanbul Technical University

2:30 PM

Nanostructured Optical Thin Films for High Temperature Gas Sensing Applications: Paul Ohodnicki¹; Thomas Brown¹; Michael Buric¹; Mark Andio¹; John Baltrus¹; Congjun Wang¹; ¹National Energy Technology Laboratory

2:45 PM

Energy Transfer in Hybrid Quantum Dots: Karel Kral¹; ¹Inst. Phys. ASCR, v.v.i.

3:00 PM

Thermochromic Doped Vanadium Dioxide Coatings for Smart Windows: Ghouwaa Philander¹; M. Maaza¹; E. Iwuoha²; ¹iThemba LABS; ²University of the Western Cape

3:15 PM

The Characteristics of Metal Nanowire Catalyzing Methanol Anodization under Variety Testing Condition: Xiaolong Qu¹; Zhengfu Zhang²; Mingli Xu²; Xianwan Yang²; ¹Kunming University of Science and Technology; ²Kunming University of Science and Technology

3:30 PM

Thermo-mechanical Experimental Investigation of the Martensitic Transformation Morphology in Nanometer Shape Memory Alloys: Huilong Hou¹; Reginald Hamilton¹; ¹The Pennsylvania State University

3:45 PM Invited

Scalable Manufacturing of Unique Hexaboride Nanomaterials for Advanced Energy Generation and Gas Storage Applications: Olivia Graeve¹; James Cahill¹; Victor Vasquez²; ¹University of California, San Diego;

²University of Nevada, Reno

4:15 PM

High Efficient Full-plastic Dye-sensitized Solar Cells Based on a Compressed Double Layer of TiO₂ and Blocking Compact Layer: Yu Ting Huang¹; Shien-Ping Feng¹; Hai Jun Su¹; ¹The University of Hong Kong

4:30 PM Invited

Combining Different Types of Solar Cells to Create Low-cost Tandems with High Efficiency: Michael McGehee¹; ¹Stanford University

4:55 PM

Hydrogen Storage Properties of a Nanostructured Palladium Alloy Processed Using Cryomilling: Joshua Yee¹; Lilia Kurmanaeva¹; Zhihui Zhang¹; Patrick Cappillino²; Vitalie Stavila²; Christopher San Marchi²; Nancy Yang²; Enrique Lavernia¹; ¹University of California, Davis; ²Sandia National Laboratories

5:10 PM

Birnessite MnO₂ Nanoflakes for Efficient Energy Storage at Elevated Temperatures: Jasper Wright¹; Wei Zhang¹; Dawei Liu¹; ¹Alfred University

5:25 PM

Ion-exchanged MnO₂ Nanoparticles as Cathodes of Lithium Ion Batteries at Elevated Temperatures: Dawei Liu¹; Jasper Wright¹; Wei Zhang¹; ¹Alfred University

5th International Symposium on High Temperature Metallurgical Processing — Microwave Heating, 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; Mark Schlesinger, Missouri University of Science and Technology; Onuralp Yücel, ITU; Rafael Padilla, University of Concepcion; Phillip Mackey, P.J. Mackey Technology; Guifeng Zhou, Wuhan Iron and Steel

Thursday PM

February 20, 2014

Room: 18

Location: San Diego Convention Center

Session Chairs: Zhiwei Peng, Michigan Technological University; Guifeng Zhou, Wuhan Iron and Steel

2:00 PM Introductory Comments

2:05 PM

Research on Microwave Roasting of High Titanium Siag Process: Kun Yang¹; ¹Kunming University of Science and Technology

2:20 PM

Study of Dielectric Properties and Drying Characteristics on Zinc Alloy Power from Electric Furnace: Aiyuan Ma¹; Libo Zhang¹; Jinhui Peng¹; Bingguo Liu¹; Yonggang Zuo¹; ¹Yunnan Provincial Key Laboratory of Intensification Metallurgy, Key Laboratory of Unconventional Metallurgy, Ministry of Education

2:35 PM

Calculation and Analysis the Influence on the Cooling Water Velocity and Hot Metal Circulation to the Long Life BF: Jiao Kexin¹; Zhang Jianliang¹; Zuo Haibin¹; Xu Runsheng¹; Hong Jun¹; ¹USTB

2:50 PM

Evaluation of Calcium Peroxide on Combustion Characteristics of Pulverized Coal for Use in Pulverized Coal Injection (PCI): Chong Zou¹; Liang-ying Wen¹; Sheng-fu Zhang¹; Chen-guang Bai¹; Guang-liang Yin¹; ¹Chongqing University

3:05 PM

Investigation of Mixing Phenomenon Using Water Model of C-H₂ Smelting Reduction Furnace: Jinyin Xie¹; Kongfang Feng¹; Jun Xu¹; Jieyu Zhang¹; ¹Shanghai University

3:20 PM

Kinetics of Directed Reduction of Ore Fines Containing Coal by Microwave Heating: *Linqing Dai*¹; Hongbo Zhu¹; Libo Zhang¹; Jinhui Peng¹; ¹Kunming University of Science and Technology

3:35 PM Break

3:45 PM

Numerical Analysis of Microwave Heating of Iron Oxide Powder Using a Multimode Cavity: Chenhui Liu¹; *Jinhui Peng*¹; ¹Kunming University of Science and Technology

4:00 PM

Numerical Simulation of Microwave Absorption of Regenerative Heat Exchangers Subjected to Microwave Heating: Xiaobiao Shang¹; Junruo Chen¹; Weifeng Zhang¹; Jinyan Shi¹; Guo Chen¹; Jinhui Peng¹; ¹Kunming University of Science and Technology

4:15 PM

Study of Dechlorination from Zinc Oxide Dust by Microwave Roasting: Zhiqiang Li¹; *Libo Zhang*¹; Aiyuan Ma¹; Jinhui Peng¹; Hongying Xia¹; Yonggang Zuo¹; ¹Yunnan Provincial Key Laboratory of Intensification Metallurgy, Key Laboratory of Unconventional Metallurgy, Ministry of Education

4:30 PM

Effects of Microwave Heating on Reduction of Ilmenite and Its Separation: Zhucheng Huang¹; Tiejui Li¹; Lingyun Yi¹; *Yuanbo Zhang*¹; ¹Central South University

4:45 PM Invited

Study on the Dielectric Properties of Panzhihua Ilmenite Concentrates by Using Terminal Open Coaxial Reflection Method: *Lei Ying*¹; Li Yu¹; Peng Jinhui²; Zhang Libo²; ¹Anhui University of Technology; ² Kunming University of Science and Technology

5:00 PM

Optimization of Processing Parameters for Microwave Direct Reduction of Titanic Iron Ore of Being Used for Electrode Coating Material Using Response Surface Methodology: *Jia Jingyan*¹; ¹Kunming University of Science and Technology

5:15 PM

Optimization on Drying of Ilmenite by Microwave Heating Using Response Surface Methodology: Yong-Gang Zuo¹; Bing-guo Liu¹; *Li-bo Zhang*¹; Jinhui Peng¹; Ai-yuan Ma¹; ¹Key Laboratory of Unconventional Metallurgy, Ministry of Education in China

Advanced Materials in Dental and Orthopedic Applications — Dental and Orthopedic Composites

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Hanson Fong, University of Washington; Mathew Mathew, Rush University Medical Center; Cortino Sukotjo, University of Illinois at Chicago

Thursday PM

Room: 1A

February 20, 2014

Location: San Diego Convention Center

Session Chair: Cortino Sukotjo, University of Illinois at Chicago

2:00 PM

In Silico Design of Nanoclay Based Nanocomposites for Orthopaedic Applications: *Kalpna Katti*¹; Anurag Sharma¹; Avinash Ambre¹; Dinesh Katti¹; ¹North Dakota State University

2:20 PM

Strategies for Improving the Performance of Dental Restorative Composites: *Dmitriy Khvostenko*¹; Jamie Kruzic¹; John Mitchell²; Thomas Hilton³; Jack Ferracane³; ¹Oregon State University; ²Midwestern University; ³Oregon Health & Science University

2:40 PM

In Situ Grafted Carbon Nanotube/Graphene/Hydroxyapatite Reinforced PMMA Composites: *Ankur Gupta*¹; Anh Ly¹; David Reid¹; Arvind Agarwal²; Sudipta Seal¹; ¹University of Central Florida; ²Florida International University

3:00 PM

Accelerated Fatigue of Dentin Caused by Demineralization: *Santiago Orrego*¹; Dominic Do¹; Hessam Majd¹; Mustafa Murat Mutluay²; Hockin H. K. Xu³; Dwayne Arola¹; ¹University of Maryland Baltimore County; ²University of Turku; ³University of Maryland, Baltimore

3:20 PM Break

3:40 PM

Preparation of Porous β -TCP/Alumina Composite and Its Characterization: *Sudalai Suriya*¹; ¹Anna University

4:00 PM

Optimising PMMA-NVP Hydrogels for Orthotropic, Self-inflating Tissue Expanders: *Jessica Smith*¹; Zamri Radzi²; David Jackson³; Jan Czernuszka¹; ¹Department of Material Science, University of Oxford; ²Faculty of Dentistry, University of Malaya; ³Oxtex Limited

4:20 PM Invited

Graphite Layer Formation in Metal-on-metal Hip Implants: *Laurence Marks*¹; ¹Northwestern University

4:40 PM

The Optimum Preparation of WC-Co Composite Powders by Sol-gel and Hydrogen Reduction: Xiaoyan Wang¹; *Zhengfu Zhang*¹; Liling Huang¹; Jinhui Peng¹; Hongying Hou¹; ¹Kunming University of Science and Technology

5:00 PM

Nitriding Behavior of Ti_6Al_4V Alloy in Gas Atmosphere: *Farid Siyahjani*¹; Erdem ATAR¹; ¹Istanbul Technical University

Aluminum Reduction Technology — Potline Operations- Control

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Margaret Hyland, University of Auckland

Thursday PM

Room: 14A

February 20, 2014

Location: San Diego Convention Center

Session Chair: Sylvain Fardeau, Rio Tinto Alcan

2:00 PM Introductory Comments

2:05 PM

Understanding and Managing Alumina Quality Fluctuations to Minimize Impact on Cell Performance and Metal Quality: *Maryam AlQubaisi*¹; Andries Louw¹; Gregory Meintjes¹; Arvind Kumar¹; Daniel Whitfield¹; Mohamed Tawfik Boraie¹; Ghedyer Hamad¹; K.G. Venkatasubramanian¹; Akhmetov Sergey¹; ¹Dubai Aluminium

2:30 PM

Developing a New Process Indicator Based on the Relationship between an Electrolysis Cell Impurity Balance and Its Incidents: *Lukas Dion*¹; László Kiss¹; Dany Lavoie²; Jean-Paul Arvisais²; ¹Université du Québec à Chicoutimi; ²Aluminerie Alouette Inc.

2:55 PM

New Generation Control for Daily Aluminium Smelter Improvement: *Yashuang Gao*¹; Albert Mulder¹; Mark Taylor¹; Dongfang Zhou²; Xiaodong Yang³; ¹University of Auckland; ²Shenyang Aluminium & Magnesium Engineering & Research Institute Co. Ltd ; ³Shenyang Aluminium & Magnesium Engineering & Research Institute Co. Ltd



3:20 PM Break

3:35 PM

Current Status of Research and Development on Automatization and Intellectuality For Plants of Aluminum in China: Jianhong Li¹; Jing Liu²; *Dingxiong Lu*²; Jihong Mao²; Qingchen Yang²; Ganfeng Tu¹; ¹Northeastern University; ²Northeastern University Engineering & Research Institute Co. Ltd.

4:00 PM

Statistical Evaluation and Modeling of the Link between Anode Effects and Bath Height, and Implications for the ALPSYS Pot Control System: *Sylvain Fardeau*¹; Arthur Martel¹; Pierre Marcellin¹; Patrick Richard¹; ¹Rio Tinto Alcan

Biological Materials Science Symposium — Biomedical Materials, Implants and Applications

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Po-Yu Chen, National Tsing Hua University; Rajendra Kasinath, Johnson and Johnson Company; Dwayne Arola, University of Washington; Kalpana Katti, North Dakota State University

Thursday PM

Room: 33A

February 20, 2014

Location: San Diego Convention Center

Session Chairs: Po-Yu Chen, National Tsing Hua University; Dwayne Arola, University of Maryland Baltimore County

2:00 PM Invited

Enamel Protein Interactions Direct Self-assembly and Guide Hydroxyapatite Formation at Physiologic Conditions: *Malcolm Sneed*¹; ¹Herman Ostrow School of Dentistry of the University of Southern California

2:30 PM

Bioactive Ceria-PLGA-Protein Based 3D Scaffold for Tissue Regeneration: *Swetha Barkam*¹; Julian Ortiz¹; Biman B Mandal²; Soumen Das¹; Sudipta Seal¹; ¹University of Central Florida; ²Indian Institute of Technology Guwahati

2:50 PM

The Impact of Grain Boundary Grooving on Biological Functions: *Krishna Chaitanya Nune*¹; Devesh Misra¹; Mahesh Somani²; Pentti Karjalainen²; ¹University of Louisiana at Lafayette; ²University of Oulu

3:10 PM

Graphene Reinforced Ultra High Molecular Weight Polyethylene for Orthopedic Application: *Debrupa Lahiri*¹; Cheng Zhang²; Rupak Dua²; Francois Hec³; Mikael Thiesse³; Andriy Durygin²; Sharan Ramaswamy²; Arvind Agarwal²; ¹Indian Institute of Technology Roorkee; ²Florida International University; ³Universite de Lyon-INSA de Lyon

3:30 PM Break

3:40 PM Invited

Dentin Hard Tissue Stabilization Using Functionalized Chitosan Nanoparticles: *Anil Kishen*¹; ¹University of Toronto

4:10 PM

The Mechanical Property and Potential Biomedical Applications of Cuttlebone: *Ming-Han Chou*¹; Yao-Tein Ku²; Yueh-Ying Chou²; Wen-Guang Liu³; Tzay-Ming Hong¹; Chuan-Chin Chiao³; Po-Yu Chen²; ¹Department of Physics, National Tsing Hua University; ²Department of Materials Science and Engineering, National Tsing Hua University; ³Department of Life Science, National Tsing Hua University

4:30 PM

Effect of Endodontic Chemicals on the Ultrastructure, Chemical and Mechanical Characteristics of Dentin Hard Tissue: *Arezou Ossareh*¹; Anil Kishen¹; ¹University of Toronto

4:50 PM

Investigation of a Commercially Pure Titanium Grade 4 for Implant Purposes: *Daniel Fernandes*¹; Carlos Elias²; Felipe Lopes²; Sergio Monteiro²; ¹University of California, San Diego; ²Military Institute of Engineering

5:10 PM

Study and Characterization of Cryorolled Zircaloy-2 Alloy as Orthopedic Implant: *Pramanshu Trivedi*¹; Sunkulp Goel¹; Snehasish Das¹; Partha Roy¹; Debrupa Lahiri¹; R Jayaganthan¹; ¹Indian Institute of Technology Roorkee India

5:30 PM Concluding Comments

Bulk Metallic Glasses XI — Mechanical and other Properties

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

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

Thursday PM

Room: 2

February 20, 2014

Location: San Diego Convention Center

Session Chairs: Maria Baró, Universitat Autònoma de Barcelona; Hongbin Bei, Oak Ridge National Laboratory

2:00 PM Invited

Thermo-mechanical Analysis of Sustained Elastic Deformation for Cu₅₀Hf_{41.5}Al_{8.5} Bulk Metallic Glass: *Rainer Hebert*¹; Arif Mubarak²; ¹University of Connecticut; ²University of Massachusetts

2:20 PM

Structural Relaxation and Dependence of Shear Modulus in Metallic-glass-forming Supercooled Liquids: *Jun Ding*¹; Yongqiang Cheng²; Evan Ma¹; ¹Johns Hopkins University; ²Oak Ridge National Laboratory

2:30 PM Invited

Nanomechanics of Structural Origin of the Ductile to Brittle Transition in Bulk Metallic Glasses: Weidong Li¹; Yanfei Gao¹; *Hongbin Bei*²; ¹University of Tennessee; ²Oak Ridge National Laboratory

2:50 PM

Changes in Tensile Ductility, Strength and Fictive Temperature of Metallic Glass Nanowires Prepared in Different Structural States by Ion Irradiation: *Daniel Magagnosc*¹; Golden Kumar²; Jan Schroers³; Peter Derlet⁴; Daniel Gianola¹; ¹University of Pennsylvania; ²Texas Tech University; ³Yale University; ⁴Paul Scherrer Institut

3:00 PM Invited

Recovery of Relaxation State in Zr-based Metallic Glasses: *Junji Saida*¹; Rui Yamada¹; Masato Wakeda²; ¹Tohoku University; ²Osaka University

3:20 PM

Effect of Thermal Oxidation on the Surface Characteristics of Zr-based Bulk Metallic Glasses: *Ka Ram Lim*¹; Won Tae Kim²; Do Hyang Kim³; ¹Korea Institute of Materials Science; ²Cheongju University; ³Yonsei University

3:30 PM Break

3:50 PM Invited

Structural and Mechanical Modifications Induced on Cu_{47.5}Zr_{47.5}Al₅ Metallic Glass by Shot Peening and Surface Laser Treatments: Jordina Fornell¹; Eva Pellicer¹; Daniel Nieto²; Eva García-Lecina²; Amadeu Concustell³; Santiago Suriñach¹; Alan Lindsey Greer⁴; *Maria D Baró*¹; Jordi Sort⁵; ¹Universitat Autònoma de Barcelona; ²CIDETEC; ³Universitat de Barcelona; ⁴University of Cambridge; ⁵Institució Catalana de Recerca i Estudis Avançats (ICREA) and Universitat Autònoma de Barcelona

4:10 PM

Temperature Effects on Mechanical Behavior of Zr-Based Bulk Metallic Glass Composites: *Jessica Booth*¹; Mohsen Seifi¹; John Lewandowski¹; ¹Case Western Reserve University

4:20 PM

Interfacial Microstructure and Mechanical Properties of Ti Joint Brazed with Ti-Zr-based Metallic Glass Filler: Joon Hyuk Lee¹; *Jin Kyu Lee*²; ¹Kongju National University; ²Kongju National University

4:30 PM

Structure and Properties of a Nanoscaled Composition Modulated Metallic Glass: *Xavier Sauvage*¹; Yannick Champion²; Reinhard Pippan³; L. Perrière²; O. Renk³; Fabien Cuvilly¹; ¹University of Rouen, CNRS; ²ICMPE, UMR 7182 CNRS-UPEC; ³Erich Schmid Institute of Material Sciences of the Austrian Academy of Sciences

4:40 PM

The Formation of Superclusters in Cu₆₄Zr₃₆ Bulk Metallic Glasses: *Jerome Zemp*¹; Massimo Celino²; Bernd Schönfeld¹; Jörg Löffler¹; ¹ETH Zurich; ²ENEA

4:50 PM

Shear Band Nucleation and Propagation in Bulk Metallic Glasses Investigated by Digital Image Correlation: *Yuan Wu*¹; H. Bei¹; Y. L. Wang¹; Y. F. Gao²; E. P. George²; ¹Materials Science and Technology Division, Oak Ridge National Laboratory; ²Materials Science and Technology Division, Oakridge National Laboratory; Department of Materials Science and Engineering, University of Tennessee

5:00 PM Invited

Distinguished Work-hardening Capacity of a Ti-based Metallic Glass Matrix Composite upon Dynamic Loading: *Junwei Qiao*¹; Huijun Yang¹; Zhihua Wang¹; Peter Liaw²; ¹Taiyuan University of Technology; ²The University of Tennessee

Celebrating the Megascale: An EPD Symposium in Honor of David G.C.Robertson — Pyrometallurgy Process Fundamentals II

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, W A School of Mines; Geoffrey Brooks, Swinburne University of Technology

Thursday PM

Room: 16A

February 20, 2014

Location: San Diego Convention Center

Session Chairs: Shin-ya Kitamura, Tohoku University; M. Rhamdhani, Swinburne University of Technology

2:00 PM Introductory Comments

2:05 PM Invited

Electricity-independent Generation of Si Based on the Use of Rice Husk: A Concept Process: *Mansoor Barati*¹; ¹University of Toronto

2:25 PM Invited

Electrically Enhanced Metal Purification Using Slag: Md Saiful Islam¹; Muhammad Akbar Rhamdhani¹; Geoff Brooks¹; ¹Swinburne University of Technology

2:45 PM

Crystallization Behavior of Molten Blast Furnace Slag Using Confocal Scanning Laser Microscope: *Liu Lu*¹; Hu Meilong¹; Bai Chenguang¹; ¹Chongqing University

3:05 PM Invited

Viscosity-Structure Relationship in the CaO-SiO₂-MnO-CaF₂ Slag for the Production of Mn Ferroalloys: *Joohyun Park*¹; Kyuyeol Ko²; ¹Hanyang University; ²LS-Nikko Copper

3:25 PM Break

3:45 PM

Recovery of Vanadium from a High Ca/V Ratio Vanadium Slag Using Sodium Roasting and Ammonia Leaching: Song Xu¹; Mujun Long¹; Dengfu Chen¹; Helin Fan¹; Yuting Chen¹; Xue Sun¹; ¹Chongqing University

4:05 PM

Sintering Process of Nickel Laterite Based of Limonitic Style: Enguang Guo¹; Mei Liu¹; Pan Chen¹; Qiugang Yuan¹; Xuewei Lv¹; ¹Chongqing University

Celebrating the Megascale: An EPD Symposium in Honor of David G.C.Robertson — Pyrometallurgy Process Fundamentals III

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, W A School of Mines; Geoffrey Brooks, Swinburne University of Technology

Thursday PM

Room: 13

February 20, 2014

Location: San Diego Convention Center

Session Chairs: Ken Coley, McMaster University; In-Ho Jung, McGill University

2:00 PM Introductory Comments

2:05 PM Invited

Development of a Thermodynamic Database for Mold Flux and Application to the Continuous Casting Process for Steelmaking: Marie-Aline Van Ende¹; *In-Ho Jung*¹; ¹McGill University

2:25 PM

Thermodynamic Optimization of Mn-Si-C System: *Min-Kyu Paek*¹; Youn-Bae Kang²; Jong-Jin Pak¹; ¹Hanyang University; ²Pohang University of Science and Technology

2:45 PM

Removal of Non-metallic Inclusions from Molten Steel Using a High Frequency Magnetic Field: Shengqian Wang¹; Lifeng Zhang¹; Yue Tian¹; ¹University of Science and Technology Beijing

3:05 PM

Fluid Flow, Alloy Dispersion and Inclusion Motion in Argon-stirred Steel Ladles: Yanlong Li¹; Lifeng Zhang¹; ¹University of Science and Technology Beijing

3:25 PM

Flow Sheet Based Approach Coupled with Application of Thermodynamics for the Modelling of Various Iron and Steelmaking Processes: *Ajay Shukla*¹; ¹Indian Institute of Technology, IIT Madras

Characterization of Minerals, Metals and Materials 2014 — Characterization of Minerals

Sponsored by: TMS Extraction and Processing Division, TMS: Materials Characterization Committee
Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Thursday PM

Room: 1B

February 20, 2014

Location: San Diego Convention Center

Session Chairs: Bowen Li, Michigan Technological University; Martin Ogwuegbu, Federal University of Technology, Owerri

2:00 PM

Microwave Permittivity, Permeability, and Penetration Depth of Pyrite: *Zhiwei Peng*¹; Jiann-Yang Hwang¹; Byoung-Gon Kim²; Jeong-Yun Kim²; Xinli Wang¹; ¹Michigan Technological University; ²Korea Institute of Geoscience and Mineral Resources

2:20 PM

Characterization of Waste from Ornamental Stones for Use in Mortar: *Afonso Azevedo*¹; Jonas Alexandre¹; Gustavo Xavier¹; Sergio Monterio²; Carlos Mauricio Vieira¹; ¹UENF; ²IME

2:40 PM

Titanomagnetite Properties and Microstructures: *Xinye Liu*¹; Whitney Schoenthal¹; Tyler Cox¹; Adam Wise¹; Michael McHenry¹; David Laughlin¹; ¹Carnegie Mellon University



3:00 PM

Characterization of Clays Using for Formulations of Detergents: *Maria das Graças Valenzuela*¹; Flavio Carvalho²; Francisco Valenzuela-Díaz²; ¹Centro Universitário Estacio Radial de São Paulo; ²University of São Paulo

3:20 PM Break

3:40 PM

Differential Characterization of Ikperejere Iron shale and Iron Sandstone Deposit: *Martin Ogwuegbu*¹; Gerald Onyedika¹; Bowen Li²; Kelechi Onwukamike¹; ¹Federal University of Technology, Owerri; ²Michigan Technological University

4:00 PM

Synthesis and Characterization of the Potassium Jarosite Analogue with Cr(VI): *Francisco Patiño*¹; Iván Reyes²; Ister Mireles¹; Juan Hernández¹; Mizraim Flores³; Martín Reyes¹; ¹Universidad Autónoma del Estado de Hidalgo; ²Universidad Tecnológica de Tula-Tepeji; ³Universidad Tecnológica de Tulancingo

4:20 PM

A New Process of Fluosilicic Acid Leaching for Recovering Bismuth from Materials Containing Bismuth Oxide: Xiang Zhang¹; Chuanfu Zhang¹; Jing Zhan¹; Zhijian Wang¹; ¹Central South University

4:40 PM

Fundamental Research on the Characteristics of Sierra Leone Iron Ore for Sintering: Jieji Dong¹; Guang Wang¹; Maofang Zuo¹; Qingguo Xue¹; ¹University of Science and Technology Beijing

Characterization of Minerals, Metals and Materials 2014 — Characterization of Soft Materials II

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

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Thursday PM
February 20, 2014

Room: 7B
Location: San Diego Convention Center

Session Chairs: Gregory Dillon, Penn State Erie, The Behrend College; Sergio Monteiro, Military Institute of Engineering

2:00 PM

Processing Determinatives of Microstructure Development in Polyureas: *Gregory Dillon*¹; Auchara Pangan²; Alicia Castagna³; James Runt²; ¹Penn State Erie, The Behrend College; ²The Pennsylvania State University; ³Du Pont

2:20 PM

Comparison between Bio-composite Based on Green HDPE/ Brazil Nut Shell Fiber (BNSF) Treated and Non Treated by Electron-beam Radiation: *Rejane de Campos*¹; Mahesh Hosur²; Shaik Jeelani²; Francisco Díaz³; Esperidiana de Moura¹; Emilia Seo¹; ¹Nuclear and Energy Research Institute, IPEN-CNEN/SP; ²Material Science and Engineering Tuskegee University; ³Metallurgical and Materials Engineering Department, Polytechnic School, University of São Paulo

2:40 PM

Dynamic-mechanical Behaviour in Epoxy Composites Reinforced with Jute Fiber: *Isabela Silva*¹; Alice Bevitori¹; Caroline Oliveira¹; Frederico Margem¹; Sergio Monteiro¹; ¹UENF

3:00 PM

Investigation on Mechanical and Morphological Behaviours of Copolyester/ Starch Blend Reinforced with Rice Husk Ash: *Eliane Oliveira*¹; Valquiria Silva¹; Rene Oliveira¹; Alejandra Teran²; Anibal Abreu Castillo³; Francisco Valenzuela-Díaz⁴; Julio Harada¹; Esperidiana Moura¹; ¹Instituto de Pesquisas Energeticas e Nucleares-IPEN-CNEN/SP; ²Laboratorio Tecnológico del Uruguay - Tecnología de Irradiación; ³Laboratorio Tecnológico del Uruguay - Tecnología de Irradiación; ⁴Metallurgical and Materials Engineering Department, Polytechnic School, University of São Paulo

3:20 PM Break

3:40 PM

Charpy Toughness Behavior of Continuous Banana Fibers Reinforced Epoxy Matrix Composites: Foluke Salgado¹; Frederico Margem¹; Sergio Monteiro¹; Romulo Loiola¹; ¹Universidade Estadual do Norte Fluminense

4:00 PM

Thermal Photoacoustic Characterization of Polymeric Composites Reinforced Polyester Ramie Fibers: *Caroline Oliveira*¹; Alice Bevitori¹; Isabela Silva¹; Frederico Margem¹; Sérgio Monteiro²; Roberto Faria Jr.¹; Thallis Cordeiro¹; Giulio Altoé¹; ¹UENF - Universidade Estadual do Norte Fluminense; ²IME - Instituto Militar de Engenharia

4:20 PM

Weibull Analysis of the Density of Ramie Fibers with Different Diameters: *Alice Bevitori*¹; Isabela Amaral da Silva¹; Caroline Gomes de Oliveira¹; Frederico Margem¹; Sergio Monteiro²; ¹UENF; ²IME

Characterization of Minerals, Metals and Materials 2014 — Method Development in Characterization

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

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

Thursday PM
February 20, 2014

Room: 7A
Location: San Diego Convention Center

Session Chairs: Eric Payton, Federal Institute for Materials Research and Testing; Julie Fife, Paul Scherrer Institut

2:00 PM

In Situ Characterizations of Complex Materials across Atomic and Microstructural Length Scales with Combined X-ray Scattering and Diffraction Techniques: *Fan Zhang*¹; Andrew Allen¹; Lyle Levine¹; Jan Ilavsky²; Carelyn Campbell¹; Adam Creuziger¹; Nataliya Kazantseva¹; ¹National Institute of Standards and Technology; ²Argonne National Laboratory

2:20 PM

Using Moment Invariants to Quantify the Extent of Rafting in Ni-based Superalloys: *Lily Nguyen*¹; Rongpei Shi²; Yunzhi Wang; Marc De Graef¹; ¹Carnegie Mellon University; ²Ohio State University

2:40 PM

Time-resolved (4D) In Situ X-ray Tomographic Microscopy at TOMCAT: Understanding the Dynamics of Materials during Elevated Temperature Processes: *Julie Fife*¹; Mattia Pistone²; Michel Rappaz³; Marco Stampanoni⁴; ¹Paul Scherrer Institut; ²University of Bristol; ³Ecole Polytechnique Fédérale de Lausanne; ⁴Paul Scherrer Institut and Swiss Federal Institute of Technology Zürich

3:00 PM

Experimental Estimation of J Integral from Load-front Face Displacement Record for Compact Tension Specimens: *Yunming Hu*¹; David Salmon¹; Kaikai Shi²; Lishun Cai²; ¹MTS Systems Corp; ²School of Mechanics and Engineering, Southwest Jiaotong University

3:20 PM

Structure Characterization of SN-based and CE-based Alloys Treated by Ultrafast Scanning: *Bingge Zhao*¹; Linfang Li¹; Qijie Zhai¹; Yulai Gao¹; ¹Shanghai University

3:40 PM Break

3:50 PM

Processing EBSD Patterns for Z-contrast Assisted Phase Segmentation: *Eric Payton*¹; Leonardo Agudo²; Gert Nolze²; ¹Alfred University; ²Federal Institute for Materials Research and Testing

4:10 PM

Determination of the Plastic Flow Stress Curve of Sheet Metal at Large Strains Using the Virtual Fields Method: Jin-Hwan Kim¹; *Myoung-Gyu Lee*¹; ¹POSTECH

4:30 PM

Anisotropic Finite Element Modeling of the Fused Deposition Modeling Process: Modeling Process: *Skyler Ogden*¹; Scott Kessler²; ¹Colorado University Boulder; ²Colorado Mesa University

4:50 PM

Lorentz Image Simulations for Quantitative Measurements of Magnetic Domain Wall Width: *Shan Hua*¹; Marc De Graef¹; ¹Carnegie Mellon University

5:10 PM

Utilizing Synchrotron Fast Microtomography for Studies of Localized Corrosion in Steel: *Xianghui Xiao*¹; Zuotao Zeng¹; Zhonghou Cai¹; Ken Natesan¹; ¹Argonne National Laboratory

Computational Discovery of Novel Materials — Optimization, Validation, and Application of Empirical Potentials

Sponsored by: TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS/ASM: Computational Materials Science and Engineering Committee

Program Organizers: Francesca Tavazza, National Institute of Standards and Technology; Richard Hennig, Cornell University; Dallas Trinkle, University of Illinois, Urbana-Champaign

Thursday PM

February 20, 2014

Room: 31A

Location: San Diego Convention Center

Session Chair: Dallas Trinkle, University of Illinois, Urbana Champaign

2:00 PM

Development of Interatomic Potentials for Screw Dislocations in Iron and Tungsten Using Ab Initio Data: *Mihai-Cosmin Marinica*¹; Lisa Ventelon¹; Mark Gilbert²; Lucile Dézerald¹; Laurent Provile¹; David Rodney³; Jaime Marian⁴; Sergei Dudarev²; Francois Willaime¹; ¹CEA; ²CCFE; ³CNRS/UJF; ⁴LANL

2:20 PM Invited

Ab Initio-based Interatomic Potentials for Body-centered Cubic Refractory Metals: *Michael Fellingner*¹; Hyoungki Park¹; Jeremy Nicklas¹; John Wilkins¹; ¹The Ohio State University

2:50 PM

Efficient Generation of Accurate Li-Ge MEAM Potentials through Coupling to an Ab-initio Structure Prediction Algorithm: *William Tipton*¹; Jeremy Nicklas²; John Wilkins²; Richard Hennig¹; ¹Cornell University; ²The Ohio State University

3:10 PM Invited

Applications of the ReaxFF Force Field for Identifying Reactive Properties for Complex Materials and Interfaces: *Adri van Duin*¹; Thomas Senftle¹; Alireza Ostadossein¹; Michael Janik¹; Sulin Zhang¹; ¹Penn State

3:40 PM Break

3:55 PM Invited

Atomistic Study of Microstructural Evolution during Eformation: *Diana Farkas*¹; ¹Virginia Tech

4:25 PM Invited

Will the Real Material Please Stand Up?: *Chandler Becker*¹; Zachary Trautt¹; ¹NIST

4:55 PM

Comparison between MD and Hybrid FEM-MD Investigations of Early Stages of Nanoindentation: *Francesca Tavazza*¹; Li Ma¹; Chandler Becker¹; Lyle Levine¹; ¹National Institute of Standards and Technology

Computational Thermodynamics and Kinetics — Battery/Oxides/Steel/Alloy

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

Thursday PM

February 20, 2014

Room: 30D

Location: San Diego Convention Center

Session Chair: Yong Ni, University of Science and Technology of China

2:00 PM

Transition from Two-phase to Single-phase Lithiation and Evolution of Diffusion Induced Stress in a Spherical Electrodes Particle under Galvanostatic Operation: *Lei Zhang*¹; *Yong Ni*¹; Linghui He¹; ¹University of Science and Technology of China

2:20 PM

Chemical and Polar Ordering in $\text{Pb}(\text{Sc}_{0.5}\text{Nb}_{0.5})\text{O}_3$ and $\text{Pb}(\text{Sc}_{0.5}\text{Ta}_{0.5})\text{O}_3$: *Benjamin Burton*¹; Eric Cockayne¹; ¹NIST

2:40 PM

Multiscale Approach for Explosive Performance: Analyses on the Effect of Hot Spot Density on Material Consumption Rate: *George Levesque*¹; Peter Vitello¹; Albert Nichols¹; Craig Tarver¹; ¹Lawrence Livermore National Laboratory

3:00 PM

Steady State Ionic Diffusion and Thick-film Stage Metal Oxidation: *Tian-Le Cheng*¹; You-Hai Wen¹; ¹National Energy Technology Laboratory

3:20 PM Break

3:50 PM

Thermochemical Models and Phase Equilibria of Urania Rare Earth Fluorite Phases: *Jacob McMurray*¹; Theodore Besmann²; Stewart Voit²; Dongwon Shin²; Benjamin Slone²; ¹University of Tennessee/Oak Ridge National Laboratory; ²Oak Ridge National Laboratory

4:10 PM

Numerical and Experimental Study of Heat Generation during Refill Friction Spot Welding: *Hua Wang*¹; ¹Helmholtz-Zentrum Geesthacht

4:30 PM

BCC Ordering Modelled Using the Compound Energy Formalism: *Bonnie Lindahl*¹; Malin Selleby¹; ¹KTH Royal Institute of Technology

Data Analytics for Materials Science and Manufacturing — Microstructure Quantification

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Jeff Simmons, Air Force Research Laboratory; Charles Bouman, Purdue University; Fariba Fahroo, Air Force Office of Scientific Research; Surya Kalidindi, Georgia Institute of Technology; Jeremy Knopp, Air Force Research Laboratory; Peter Voorhees, Northwestern University

Thursday PM

February 20, 2014

Room: 30E

Location: San Diego Convention Center

Session Chairs: Patrick Callahan, Carnegie Mellon University; Stephen Niezgod, The Ohio State University

2:00 PM Invited

Quantifying the Similarity between Two Microstructures: *Patrick Callahan*¹; ¹Carnegie Mellon University



2:25 PM

Toward the Minimal Set of Morphological Information for Statistical Material Microstructure Modeling: *Yang Jiao*¹; ¹Arizona State University

2:45 PM

Virtual Analysis of Experimental Techniques for Determining Grain Volume Distribution and Number per Unit Volume: *Tyler Kaub*¹; Robert DeHoff¹; Veena Tikare²; Burton Patterson¹; ¹University of Florida; ²Sandia National Laboratories, New Mexico

3:05 PM

A Markov Random Field Approach for Microstructure Synthesis: *Abhishek Kumar*¹; *Veera Sundararaghavan*¹; ¹Aerospace Department

3:25 PM Invited

2D Stochastic-integral Models for Characterizing Random Grain Noise in Titanium Alloys: *Elias Sabbagh*¹; R. Murphy¹; Harold Sabbagh¹; Matthew Cherry²; Adam Pilchak³; Jeremy Knopp³; Mark Blodgett⁴; ¹Victor Technologies, LLC; ²University of Dayton Research Institute; ³Air Force Research Laboratory; ⁴Wright-Patterson AFB

3:50 PM Break

4:00 PM Invited

Data Analysis and Quantification of 3D Microstructures: *David Rowenhorst*¹; Amanda Levinson¹; Richard Fonda¹; ¹The US Naval Research Laboratory

4:25 PM Invited

Comparison of Novel Microstructure Quantification Frameworks for Visualization, and Analysis of Microstructure Data: *Stephen Niezgodá*¹; ¹Department of Materials Science and Engineering, The Ohio State University

4:50 PM

Integrated Material Characterization Property Prediction Using 3D Image-based Analytics and Modeling: *Shawn Zhang*¹; ¹FEI

5:10 PM

A Novel Method for Automated Quantification of Particles in Solidified Aluminium: *Robert Fritzsche*¹; Shahin Akbarnejad¹; Ragnhild Aune²; ¹Norwegian University of Science and Technology; ²Royal Institute of Technology (KTH), Sweden

Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — Mechanical Properties

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

Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Thursday PM

Room: 3

February 20, 2014

Location: San Diego Convention Center

Session Chairs: Said Ahzi, University of Strasbourg; Ellen Cereta, Los Alamos National Laboratory

2:00 PM Keynote

Influences on Susceptibility to Adiabatic Shear Failure of HSLA-steels: *Lothar Meyer*¹; Frank Pursche¹; Norman Herzog¹; ¹Nordmetall GmbH

2:30 PM Invited

Mechanistic Response of Boron-icosahedral Based Compounds to Knoop Indentation: *Jerry LaSalvia*¹; Vladislav Domnich²; Kelvin Xie³; Scott Walck¹; Robert Pavlacka¹; James Campbell¹; ¹U.S. Army Research Laboratory; ²Rutgers University; ³Johns Hopkins University

2:50 PM

The Role of Defects on the Dynamic Fragmentation of SiC Ceramics under Impact Loading: *Pascal Forquin*¹; Gilles Rossiquet²; ¹Grenoble University; ²Saint-Gobain CREE

3:10 PM

Microstructure Investigations of Conventional and Harmonic Pure Titanium Deformed by Direct Impact Hopkinson Pressure Bars (DIHPB):

David Tingaud¹; Kei Ameyama²; Hervé Couque³; Takahiro Seo²; *Guy Dirras*¹; ¹Université Paris 13; ²Ritsumeikan University; ³Nexter-Munitions

3:30 PM Break

3:50 PM

Laser Shock-induced Spall in Tantalum: *Tane Remington*¹; Christopher Wehrenberg²; Brian Maddox²; Damien Swift²; Bruce Remington²; Marc Meyers¹; ¹UCSD; ²LLNL

4:10 PM

Microstructure and Properties of Dynamically Deformed Fe-6Ni Martensitic Steel: *Hassan Ghassemi Armaki*¹; Sharvan Kumar¹; ¹Brown University

4:30 PM

Experimental Study on Deformation and Fracture of Al₂O₃ Ceramic under Dynamic Loading: *Jingjing Chen*¹; Baoqiao Guo¹; Haibo Liu¹; *Pengwan Chen*¹; ¹Beijing Institute of Technology

4:50 PM

Failure Process of Alumina Ceramics under Dynamic Uniaxial Compression: *Peifeng Li*¹; Zhiyong Wang¹; ¹Nanyang Technological University

5:10 PM

Vaporizing Foil Actuator: A Novel Tool for Collision Welding: *Anupam Vivek*¹; Glenn Daehn¹; Steven Hansen¹; Bert Liu¹; ¹Ohio State University

Electrode Technology for Aluminium Production — Inert Anodes, Cathode Design and Alternative Processes

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizer: Andre Proulx, Rio Tinto Alcan

Thursday PM

Room: 14B

February 20, 2014

Location: San Diego Convention Center

Session Chair: Gregory Goupil, Institut National de la Recherche Scientifique (INRS)

2:00 PM Introductory Comments

2:05 PM

Effect of La on the Electrolysis Performance of 46Cu-25Ni-19Fe-10Al Metal Inert Anode: *Peng Weiping*¹; Liu Ying¹; Guo Jie¹; Zhao Ruilong¹; Yang Jianhong¹; Li Wangxing¹; ¹Chalco

2:30 PM

Evaluation of Different Strategies for Limiting Electrolyte Penetration in Cu-Ni-Fe-O Anodes for Al Electrolysis: *Gregory Goupil*¹; Elena Gavrilova¹; Boyd David²; Daniel Guay¹; Lionel Roué¹; ¹INRS-EMT; ²KPM Inc.

2:55 PM

Inert Anodes: An Update: *Rudolf Pawlek*¹; ¹TS+C

3:20 PM

Investigating the Corrosion Behaviors of Fe-Ni-Cr Anode Material for Aluminum Electrolysis: *Zengjie Wang*¹; Jilai Xue¹; Luxing Feng¹; Fangyin Dai¹; ¹University of Science and Technology Beijing

3:45 PM Break

3:55 PM

The Metal Phase Selection of 10NiO-NiFe₂O₄-based Cermet Anodes for Aluminum Electrolysis: *Hanbing He*¹; ¹Central South University

4:20 PM

Study on the Anode and Cathode Configuration of Aluminum Reduction Cell: *Yungang Ban*¹; Yu Mao¹; Jihong Mao¹; Xiaoling Yang¹; Jing Liu¹; Zhenyu Cao¹; ¹Northeastern University Engineering & Research Institute Co. Ltd

4:45 PM

Study on Cathode Structure Optimization of Aluminum Reduction Cell: *Yungang Ban*¹; Yu Mao¹; Jihong Mao¹; Xiaoling Yang¹; Hui Dong¹; Shangyuan Wang¹; ¹Northeastern University Engineering & Research Institute Co. Ltd

Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention — Environmental-temperature Effects on Fatigue and Life Prediction

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

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

Thursday PM
February 20, 2014

Room: 10
Location: San Diego Convention Center

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

2:00 PM Introductory Comments

2:05 PM Invited

Control of the Environmental Contribution to Fatigue in Aluminum Alloys: Richard Gangloff¹; ¹University of Virginia

2:25 PM

Fracture Mechanics Solutions for Failure Modes of Adhesive-Bonded Lap-Shear Specimens of Magnesium and Steel Sheets: Wei-Jen Lai¹; Jwo Pan¹; Tsung-Yu Pan²; Zhili Feng²; Michael Santella²; ¹University of Michigan; ²Oak Ridge National Laboratory

2:45 PM Invited

Fatigue Life Prediction of Magnesium Alloys Subjected to Variable Amplitude Loading: Hongtae Kang¹; Jing Xiao¹; A.K. Khosrovaneh²; Y.L. Lee³; Xuming Su⁴; ¹University of Michigan at Dearborn; ²General Motor Company LLC.; ³Chrysler LLC.; ⁴Ford Motors

3:05 PM

Thermodynamic Considerations of Vacuum Levels for Simulating Internal Fatigue Crack Growth in Titanium Alloys and Nickel-base Superalloys: Vikas Sinha¹; James Larsen²; ¹Air Force Research Laboratory, Materials and Manufacturing Directorate; UES, Inc. ²Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/RXCM, Wright-Patterson Air Force Base

3:25 PM Break

3:45 PM

Fatigue Fracture Mechanisms in Nickel-base Superalloy IN100 at Room and Elevated Temperatures: Vikas Sinha¹; Sushant Jha²; William Porter, III³; Michael Caton⁴; James Larsen⁴; ¹Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/RXCM, Wright-Patterson Air Force Base; UES, Inc.; ²Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/RXCM, Wright-Patterson Air Force Base; Universal Technology Corporation; ³Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/RXCM, Wright-Patterson Air Force Base; University of Dayton Research Institute; ⁴Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/RXCM, Wright-Patterson Air Force Base

4:05 PM

Fatigue Behavior Self-piecing Rivets and Clinch Joints of Aluminum Sheets: Cheng-Ming Su¹; Pai-Chen Lin¹; Wei-Jen Lai²; Jwo Pan²; ¹National Chung Cheng University; ²University of Michigan

4:25 PM

Effects of Sn-grain Orientation on the Fatigue Life of Lead-free Solder Joints: Luke Wentlent¹; Sa'D Hamasha¹; Debora Schmitz¹; Peter Borgesen¹; ¹Binghamton University

4:45 PM

Effects of Hot Compressive Dwell on Fatigue Crack Growth Behavior of Cast Aluminum Alloys: Xiang Chen¹; Diana Lados¹; Richard Pettit²; ¹Worcester Polytechnic Institute; ²FractureLab

5:05 PM Concluding Comments

Gamma TiAl Alloys 2014 — Session VIII - Panel Discussion

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Titanium Committee

Program Organizers: Young-Won Kim, Gamteck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimiduk, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

Thursday PM
February 20, 2014

Room: 6B
Location: San Diego Convention Center

Session Chairs: Fritz Appel, Helmholtz-Zentrum-Geesthacht; Dennis Dimiduk, Air Force Research Laboratory

2:00 PM Invited

Advances, Dilemmas and Future of Gamma Alloy Materials-processes Technology: Young-Won Kim¹; ¹Gamteck, Inc.

2:25 PM Panel Discussion - Wrought Alloys - Status, Issues, Dilemma, and Future

2:50 PM Panel Discussion - Cast Alloys for AeroEngine Applications - Status, Issues, Dilemma, and Future

3:15 PM Panel Discussion - Cast Alloys for Turbocharger Wheels - Status, Issues, Dilemma, and Future

3:40 PM Break

3:50 PM Panel Discussion - Beta-Solidified Alloys - Status, Issues and Future

4:20 PM Panel Discussion - Current and Novel Processing - Status, Issues and Future

4:50 PM Panel Discussion - Future Applications and Their Issues

5:10 PM Concluding Comments

Integration of Materials Science and Nondestructive Evaluation for Materials Characterization — Quantitative Nondestructive Characterization III

Sponsored by: TMS Structural Materials Division, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Adam Pilchak, Air Force Research Laboratory; Dennis Dimiduk, Air Force Research Laboratory; Eric Lindgren, Air Force Research Laboratory; Richard Lesar, Iowa State University; Leonard Bond, Iowa State University

Thursday PM
February 20, 2014

Room: 8
Location: San Diego Convention Center

Session Chairs: Nikhilesh Chawla, Arizona State University; Eric Lindgren, Air Force Research Laboratory

2:00 PM Invited

Application of Acoustic Emission Technique for Online Monitoring of Friction Stir Welding Process during Welding of AA6061-T6 Aluminum Alloy: B M Rajaprakash¹; Suresha C N²; sarala Upadhyay¹; Rachappa¹; ¹University Visvesvaraya College of Engineering; ²Jyothy Institute of Technology

2:30 PM

Forward Modeling of Crack Induced Wave Propagation: Jefferson Cuadra¹; Matteo Mazzotti¹; Prashanth Vanniamparambil¹; Ivan Bartoli¹; Antonios Kotsos¹; ¹Drexel University

2:50 PM

Microstructural Evaluation of a Lean Duplex UNS S32304 - X-ray Diffraction and Scanning Electron Microscopy Techniques Correlated with Eddy Current Testing: Adriana Rocha¹; Maria Lopez¹; Joao Alcoforado Rebello¹; Sergio Tavares²; ¹LNDC/COPPE/UFRJ; ²UFF



3:10 PM

Non-destructively Monitoring the Variations of Rolling and Annealing Texture in Low-C Steel Sheets by Magnetic Barkhausen Noise Method: *Hakan Gur*¹; Umit Akcaoglu²; ¹Metallurgical & Materials Eng. Dept.; ²Middle East Technical University

3:30 PM Break

3:45 PM

Probing Fundamentals of Acoustic Emission during Micro-scratch Testing: *Alexey Danyuk*¹; Dmitry Merson¹; Igor Yasnikov¹; Alexei Vinogradov²; ¹Togliatti State University; ²Togliatti State University

4:05 PM

Revealing Acting Deformation Mechanisms in Mg Alloys with In Situ Monitoring of Acoustic Emission: *Alexei Vinogradov*¹; Alexey Danyuk²; Dmitry Orlov³; Yuri Estrin⁴; Kei Ameyama³; ¹Togliatti State University; ²Togliatti State University; ³Ritsumeikan University; ⁴Monash University

4:25 PM

Stochastic Reconstruction of 3D Grain Orientations and 2nd Phase Particles in Metallic Microstructures from 2D Images: *Yang Jiao*¹; Antony Kirubanandham¹; Nikhilesh Chawla¹; ¹Arizona State University

Magnesium Technology 2014 — Alloy Design

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Thursday PM

Room: 17A

February 20, 2014

Location: San Diego Convention Center

Session Chairs: Alan Luo, Ohio State University; Sean Agnew, University of Virginia

2:00 PM

In-situ Neutron Diffraction Study of Aging in Alloy ZK60A: *Sean Agnew*¹; Christopher Calhoun¹; Bjorn Clausen²; ¹University of Virginia; ²Los Alamos National Laboratory

2:20 PM

Development of a High Strength Ductile Wrought Mg-Zn Based Alloy: *Lan Ma*¹; Taisuke Sasaki¹; Taiki Nakata²; Tadakatsu Ohkubo¹; Kazuhiro Hono¹; Shigeharu Kamado²; ¹National Institute for Materials Science; ²Nagaoka University of Technology

2:40 PM

Significant Precipitation Strengthening in Extruded Mg-Sn-Zn Alloys: *Taisuke Sasaki*¹; Fady Elsayed²; Taiki Nakata³; Shigeharu Kamado³; Tadakatsu Ohkubo¹; Kazuhiro Hono¹; ¹National Institute for Materials Science; ²University of Tsukuba; ³Nagaoka University of Technology

3:00 PM

Al and Zn Impurity Diffusion in Binary and Ternary Magnesium Solid-solutions: *Catherine Kammerer*¹; Nagraj Kulkarni²; Robert Warmack²; Yongho Sohn¹; ¹University of Central Florida; ²Oak Ridge National Laboratory

3:20 PM

Formation and Evolution of Intermetallic Phases in the Mg-Nd-Zn-Zr System: *Ke-Xue Peng*¹; Jie-Yu Zhang¹; Zhi-Hong Zhang²; Qian Li¹; ¹Shanghai Key Laboratory of Modern Metallurgy & Materials Processing, Shanghai University; ²Baotou Research Institute of Rare Earths

Magnesium Technology 2014 — Biomedical Applications

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

Thursday PM

Room: 19

February 20, 2014

Location: San Diego Convention Center

Session Chairs: Michele Manuel, University of Florida; Wim Sillekens, European Space Agency

2:00 PM Invited

Design Strategy for Zn Reduction in an Extreme-high-pure Mg-Zn-Ca System with High Strength and Simultaneously High Ductility: *Joëlle Hofstetter*¹; Minh Becker¹; Christian Wegmann¹; Jörg Löffler¹; Peter Uggowitzer¹; ¹ETH Zurich

2:20 PM

Development of a Generalized Understanding of Environmentally-Assisted Degradation of Mg-Al Alloys: *Nicholas Winzer*¹; Heiko Höpfel¹; Paula Casajus¹; ¹Fraunhofer IWM

2:40 PM

Coating Systems for Biodegradable Magnesium Applications: *Jan-Marten Seitz*¹; Matthew Vaughan²; Rainer Eifler¹; Chris Seal³; Margaret Hyland³; Hans Jürgen Maier¹; ¹Leibniz Universität Hannover; ²Texas A&M University; ³The University of Auckland

3:00 PM

Improvement of Cytocompatibility of Magnesium Alloy ZM21 by Surface Modification: *Agnieszka Witecka*¹; Akiko Yamamoto¹; Wojciech Swieszkowski²; ¹National Institute for Materials Science; ²Warsaw University of Technology

3:20 PM

Cytocompatibility of Mg Alloys and the Effect of Cells on Their Degradation in Biological Environment: *Akiko Yamamoto*¹; Yuko Kohyama¹; ¹National Institute for Materials Science

3:40 PM

Selective Laser Melting of Magnesium Parts: *Matthias Gieseke*¹; Christian Nolke²; Stefan Kaierle²; Hans Meier³; Heinz Haferkamp³; ¹Laser Zentrum Hannover; ²Laser Zentrum Hannover e.V.; ³Leibniz Universität

Materials and Fuels for the Current and Advanced Nuclear Reactors III — General

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

Program Organizers: Ramprasad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Thursday PM

Room: 32B

February 20, 2014

Location: San Diego Convention Center

Session Chair: Walter Luscher, Pacific Northwest National Laboratory

2:00 PM

Spectroscopic Real Time Monitoring of Molten Salts in Nuclear Electrorefiner Systems: *Michael Simpson*¹; ¹University of Utah

2:20 PM

Nano-particles for Spent Nuclear Fuel Separation: *Maninder Kaur*¹; *Yaqiao Wu*²; Huijin Zhang¹; You Qiang¹; Leigh Martin³; Terry Todd³; ¹University of Idaho; ²Boise State University; ³Idaho National Laboratory

2:40 PM

Design of an In-reactor Experiment to Measure Tritium Release Kinetics and Speciation from LiAlO₂-based Breeding Materials: *Walter Luscher*¹; David Senor¹; Robert Gates¹; Bruce Schmitt¹; Edward Love¹; Jim Livingston¹; David Baldwin¹; Kevin Clayton²; Glen Longhurst³; ¹Pacific Northwest

National Laboratory; ²Idaho National Laboratory; ³Southern Utah University

3:00 PM

Molten Salts and Nuclear Energy: *Marcelle Gaune-Escard*¹; ¹Polytech

3:20 PM

Interactions between Gliding Dislocations and Different Types of the Irradiation-induced Loops in α -iron: Molecular Dynamics Simulations and Dislocation Dynamics Simulations Comparison: *Xiangjun Shi*¹; Laurent Dupuy¹; Benoit Devincere²; Dmitry Terentyev³; Ludovic Vincent¹; ¹CEA, DEN, SRMA; ²Laboratoire d'Etude des Microstructures, CNRS-ONERA; ³SCK-CEN, Nuclear Materials Science Institute

3:40 PM Break

4:00 PM

The Effects of Processing on Precipitate Distribution and Mechanical Properties of a Nanostructured Ferritic Alloy (NFA): *Laura Dial*¹; Richard DiDomizio¹; Shenyan (Sharon) Huang¹; Ning Zhou¹; ¹GE Global Research

4:20 PM

Line Dislocation Dynamics Simulation of Fundamental Dislocation Properties in Zirconium: *Apu Sarkar*¹; Jacob Eapen¹; K.L. Murty¹; ¹North Carolina State University

4:40 PM

Understanding the Mechanisms for Amorphization Resistance in ZrC: *Ming-Jie Zheng*¹; Izabela Szlufarska¹; Dane Morgan¹; ¹University of Wisconsin, Madison

5:00 PM

Correlation of Crystallographic Texture of Zr-excel Pressure Tube Materials with Thermal Creep Behavior: *Kazi. F Ahmed*¹; Mark. R Daymond¹; ¹Queens University

5:20 PM Concluding Comments

Materials and Fuels for the Current and Advanced Nuclear Reactors III — Modeling

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

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Thursday PM
February 20, 2014

Room: 33C
Location: San Diego Convention Center

Session Chair: Remi Dingreville, Sandia National Laboratories

2:00 PM Invited

Thermal Transport in Uranium Dioxide from First Principles: *Simon Phillpot*¹; Aleksandr Chernatynskiy¹; ¹University of Florida

2:25 PM

Grain Boundary Diffusion of Ag in Polycrystalline Silicon Carbide in TRISO Fuel Particles: *Jie Deng*¹; Hyunseok Ko¹; Dane Morgan¹; Izabela Szlufarska¹; ¹Department of Materials Science and Engineering, University of Wisconsin, Madison

2:40 PM

Material Characterization of Zr Nuclear Fuel Clad Tubes via Imperfection Modeling: *Elizabeth Stephens*¹; Rick Shimskey¹; Richard Davies¹; Curt Lavender¹; ¹Pacific Northwest National Laboratory

2:55 PM

Integration of a Viscoplastic Self Consistent Plasticity Model with Finite Element Framework MOOSE: *Alankar Alankar*¹; Ricardo Lebensohn¹; ¹Los Alamos National Laboratory

3:10 PM

A Micromechanical Model of Hydrided Cladding under Long-term Storage and Transport: *Remi Dingreville*¹; Glen Hansen¹; ¹Sandia National Laboratories

3:25 PM Break

3:45 PM Invited

Radiation Induced Hardening in Iron and Ferritic Alloys: An Atomic-scale View: *Yury Osetskii*¹; Roger Stoller¹; Dmitry Terentyev²; ¹Oak Ridge National Laboratory; ²SCK

4:10 PM

Thermodynamic Modeling of Precipitate Phases in Austenitic Steels: *Ying Yang*¹; Jeremy Busby¹; ¹Oak Ridge National Laboratory

4:25 PM

Electronic Structure Calculations of Structure and Chemistry of the Y_2O_3 /Fe Interface: *Samrat Choudhury*¹; Christopher Stanek¹; Blas Ueberuaga¹; ¹Los Alamos National Laboratory

4:40 PM

Thermodynamic and Kinetic Modeling of Oxide Precipitation in Nanostructured Ferritic Alloys: *Leland Barnard*¹; G. Robert Odette²; Nicholas Cunningham²; Izabela Szlufarska¹; Dane Morgan¹; ¹University of Wisconsin, Madison; ²University of California Santa Barbara

4:55 PM

A Unified Viscoplastic Constitutive Model for Creep Damage Analysis in the Welded Joints of Modified 9Cr-1Mo Steel: *Mehdi Basirat*¹; Triratna Shrestha¹; Indrajit Charit¹; Gabriel Potirniche¹; ¹University of Idaho

5:10 PM

Ab Initio Enhanced CALPHAD Modeling of Actinide Rich Metallic Nuclear Fuels: *Wei Xie*¹; Wei Xiong¹; Chris Marianetti²; Dane Morgan¹; ¹University of Wisconsin, Madison; ²Columbia University

Materials for High-temperature Applications: Next Generation Superalloys and Beyond — Emerging Materials

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Refractory Metals Committee

Program Organizers: Omer Dogan, DOE National Energy Technology Laboratory; Panos Tsakiroopoulos, University of Sheffield; Xingbo Liu, West Virginia University; Paul Jablonski, DOE National Energy Technology Lab; Junpin Lin, University of Science and Technology Beijing

Thursday PM
February 20, 2014

Room: 6D
Location: San Diego Convention Center

Session Chairs: Jim Ciulik, M&M Engineering Associates; David Honecker, Climax Molybdenum Technology Center

2:00 PM Invited

Prospective and Challenges of Nanolaminated Ternary Carbides and Nitrides (MAX Phases): *Yanchun Zhou*¹; ¹Aerospace Research Institute of Materials & Processing Technology

2:30 PM

Fabrication and Mechanical Properties of Fiber-reinforced Ti_2AlC and Ti_3SiC_2 : *Huili Gao*¹; Darin Tallman²; Morgan O'Neil¹; Michel Barsoum²; Miladin Radovic¹; ¹Texas A&M University; ²Drexel University

2:50 PM

Pt-base Superalloys for Ultra High Temperature Applications: *Rainer Völkl*¹; ¹University Bayreuth

3:10 PM

Hierarchical Microstructure of Ferritic Alloys Strengthened By Two-phase L_2 - Ni_2TiAl / B_2 - $NiAl$ Precipitates: *Christian Liebscher*¹; Velimir Radmilovic²; Ulrich Dahmen³; Mark Asta¹; Gautam Ghosh⁴; ¹UC Berkeley; ²University of Belgrade; ³Lawrence Berkeley National Laboratory; ⁴Northwestern University



3:30 PM Break

3:45 PM

Mechanical Testing of Ferritic Oxide Dispersion Strengthened Steel Structures Produced by Selective Laser Melting: *Thomas Boegelein*¹; Sebastien Dryepondt²; Amit Pandey²; Joseph Robinson³; Jetinder Singh³; Gordon Tatlock¹; Karl Dawson¹; ¹High Temperature Materials Group, School of Engineering, University of Liverpool; ²Materials Science and Technology Division, Oak Ridge National Laboratory; ³Manufacturing Science and Engineering Research Centre, School of Engineering, University of Liverpool

4:05 PM

Thermodynamic Modeling of Wetting in C/Cu Composites: *Khurram Iqbal*¹; Jianjun Sha¹; ¹Dalian University of Technology

Mechanical Behavior at the Nanoscale II — Length Scale Effects

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Thursday PM

February 20, 2014

Room: 9

Location: San Diego Convention Center

Session Chairs: Megan Cordill, Erich Schmid Institute of Materials Science; Evan Ma, Johns Hopkins University

2:00 PM

Film Thickness Effects on the Deformation Behavior of Cu/Cr Thin Films on Polyimide: *Vera Marx*¹; Christoph Kirchlechner¹; Megan Cordill²; Gerhard Dehm¹; ¹Max-Planck-Institut für Eisenforschung GmbH; ²Erich Schmid Institute of Materials Science, Austrian Academy of Sciences

2:20 PM

Damage Evolution during Cyclic Tension-tension Loading of Micron-sized Cu Lines at Temperatures up to 673 K: *Alexander Wimmer*¹; Alexander Leitner²; Thomas Detzel³; Werner Robl⁴; Walther Heinz⁵; Gerhard Dehm⁶; ¹Austrian Academy of Sciences; ²Department Materials Physics, University of Leoben; ³Infineon Technologies Austria AG; ⁴Infineon Technologies Germany AG; ⁵Kompetenzzentrum Automobil- und Industrie-Elektronik GmbH; ⁶Max-Planck-Institute fuer Eisenforschung

2:40 PM

Surface Energy Drives Size Effect in Nano-sized Metallic Glasses: *David Chen*¹; Dongchan Jang¹; Kelly Guan²; Qi An³; William Goddard³; Julia Greer¹; ¹Division of Engineering and Applied Sciences, California Institute of Technology; ²Department of Chemistry and Chemical Engineering, California Institute of Technology; ³Materials and Process Simulation Center, California Institute of Technology

3:00 PM

Enhanced Radiation Tolerance and Strengthening Mechanisms in Helium Ion Irradiated Cu/Co Multilayers: *Youxing Chen*¹; Xinghang Zhang¹; ¹Texas A&M University

3:20 PM

In Situ Measurement and Modeling of Intrinsic Stress Evolution in Nanocrystalline Films: *Hang Yu*¹; Carl Thompson¹; ¹Massachusetts Institute of Technology

3:40 PM Break

3:55 PM

Reversible Cyclic Deformation of Au Nanowires by a Transition to a Twinning-detwinning Mechanism Evidenced from In Situ TEM: *Subin Lee*¹; Jiseong Im¹; Youngdong Yoo²; Erik Bitzek³; Daniel Kiener⁴; Bongsoo Kim²; Sang Ho Oh¹; ¹POSTECH; ²KAIST; ³Friedrich-Alexander Universität Erlangen-Nürnberg; ⁴Montanuniversität

4:15 PM

Mechanical Behaviors of Nanostructures of Low Melting Temperature Metals as Revealed by Synchrotron Laue X-ray Microdiffraction: *Arief Budiman*¹; M Burek²; Lucas Berla³; D Jang⁴; Martin Kunz⁵; Nobumichi Tamura⁵; William Nix³; Julia Greer⁴; Ting Tsui²; ¹Singapore University of Technology & Design (SUTD); ²University of Waterloo; ³Stanford University; ⁴California Institute of Technology; ⁵Advanced Light Source (ALS)

4:35 PM

Mechanical Behavior of Dealloyed Nanoporous Silicon: *Xu Jiang*¹; Thomas Balk¹; ¹University of Kentucky

4:55 PM

Compression Behaviour of Nanoporous Gold Studied by Molecular Dynamics Simulation: *Bao-Nam Ngo*¹; Alexander Stukowski²; Karsten Albe²; Joerg Weissmueller³; ¹Helmholtz-Zentrum Geesthacht; ²Technische Universitaet Darmstadt; ³Technische Universitaet Hamburg-Harburg

5:15 PM

Micro-mechanical Behavior and Reliability Assessment of Micro-injection-molded and Shape Cut 17-4 PH Stainless Steel Based MEMS: *Stefan Slaby*¹; Tobias Müller¹; Volker Pottler¹; Oliver Kraft¹; Christoph Eberl²; ¹Karlsruhe Institute of Technologie (KIT); ²Fraunhofer Institute for Mechanics of Materials Freiburg

Mechanical Behavior Related to Interface Physics II — Biphase Boundary Effects on Mechanical Response of Composites II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Nan Li, Los Alamos National Laboratory; Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Tonya Stone, Mississippi State University

Thursday PM

February 20, 2014

Room: 11A

Location: San Diego Convention Center

Session Chairs: Caizhi Zhou, Missouri University of Science and Technology; Dallas Trinkle, University of Illinois, Urbana-Champaign

2:00 PM Invited

Density-functional Theory Methods for Interfaces: Lattice Greens Function and Energy Density Methods: *Dallas Trinkle*¹; Min Yu²; Bora Lee¹; Maryam Ghazisaeidi³; ¹University of Illinois, Urbana-Champaign; ²Lawrence Berkeley National Laboratory; ³Ohio State University

2:30 PM

3D Discrete Dislocation Dynamics Simulations of Plasticity in Al-TiN Nanolayered Composites: *Caizhi Zhou*¹; ¹Los Alamos National Laboratory

2:50 PM Invited

Interface Behavior in Plastically Deformed Nanoscale Metallic Multilayers: *Guang-Ping Zhang*¹; Jia-Wei Yan¹; Yuan-Ping Li¹; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences

3:20 PM

Effect of Misfit Dislocations on Structure, Bonding and Adhesive Strength of Interfaces between bcc and fcc Fe and Transition Metal Carbides: First Principles Modeling: *Oleg Kontsevoi*¹; Arthur Freeman¹; Gregory Olson¹; ¹Northwestern University

3:40 PM Break

4:00 PM Invited

Buckling Behaviors and Adhesion Energy of Nanostructured Cu/X (X = Nb, Zr) Multilayer Films on Compliant Substrate: *Gang Liu*¹; Kai Wu¹; Jin-Yu Zhang¹; Jun Sun¹; ¹Xi'an Jiaotong University

4:30 PM

Interface-based Plasticity in the Nanoscale Multilayers as Revealed by Synchrotron X-ray Microdiffraction: *Arief Budiman*¹; Nan Li²; Lucas Berla³; Youbin Kim⁴; Seungmin Han⁴; Martin Kunz⁵; Nobumichi Tamura⁵; William Nix³; Jian Wang²; Amit Misra²; ¹Singapore University of Technology &

Design (SUTD); ²LANL; ³Stanford University; ⁴KAIST; ⁵ALS

4:50 PM

Dislocation Mechanisms in Semi-coherent Interfaces in Nanoscale Metallic Laminates: *Firas Akasheh*¹; Mohammad Rezaul Karim¹; ¹Tuskegee University

5:10 PM

Effect of Friction Stir Welding on the Structural Stability and Local Mechanical Properties in Cu-Nb Multilayered Nano-composites: *Shraddha Vachhani*¹; Josef Cobb²; Judy Schneider²; John Carpenter³; Nathan Mara³; ¹Georgia Institute of Technology; ²Mississippi State University; ³Los Alamos National Laboratory

Mechanical Behavior Related to Interface Physics II — Biphase Boundary Effects on Mechanical Response of Composites III

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Nan Li, Los Alamos National Laboratory; Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Tonya Stone, Mississippi State University

Thursday PM
February 20, 2014

Room: 12
Location: San Diego Convention Center

Session Chairs: John Carpenter, Los Alamos National Laboratory; Yao Shen, Shanghai Jiao Tong University

2:00 PM

Simulations for 2-D and 3-D Thermoelastic Stress Distributions in Textured Sn Films Related to Whisker Formation: *Wei-Hsun Chen*¹; Benjamin Anglin²; Carol Handwerker¹; Anthony Rollett²; John Blendell¹; ¹Purdue University; ²Carnegie Mellon University

2:20 PM

Interpreting Hardness Data in Nanoscale Multilayer Thin Films: *Michael Gram*¹; Amit Misra²; Peter Anderson¹; ¹Ohio State University; ²Los Alamos National Laboratory

2:40 PM Invited

Effect of Joining on Texture Evolution and Interface Character in Bulk Cu-Nb Multilayer Nanocomposites: *John Carpenter*¹; Josef Cobb²; Shraddha Vachhani³; S. Gravener¹; Rodney McCabe¹; Patricia Dickerson¹; Robert Dickerson¹; Irene Beyerlein¹; Judy Schneider²; Nathan Mara¹; ¹Los Alamos National Laboratory; ²Mississippi State University; ³Georgia Tech

3:10 PM

MD Study of PMMA/CNT Nanocomposites: *Yae Ji Kim*¹; Alejandro Strachan¹; ¹Purdue University

3:30 PM Break

3:50 PM

Mechanical Behavior of Cr Films on Polyimide as a Function of the Deposition Technique: *Verena Maier*¹; Jörg Paulitsch²; Megan Cordill³; ¹University of Leoben; ²Vienna University of Technology; ³Erich Schmid Institute of Materials Science

4:10 PM Invited

Stress for Transmission of Dislocations Across Interfaces in Multilayers and Reverse Hall-petch Relationship in the Ultrathin Layer Thickness Limit: *Shihui He*¹; *Yao Shen*¹; Xiao Gu¹; Nan Li²; ¹Shanghai Jiao Tong University; ²Los Alamos National Laboratory

4:40 PM

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

5:00 PM

Texture Evolution and Bingham Modeling of Nb in Multilayered Ti/Al/Nb Composite Fabricated by ARB Processing: *Liming Zhou*¹; Viola Acoff¹;

¹The University of Alabama

5:20 PM

Plasticity Evolution in the Nanoscale Cu/Nb Multilayers as Revealed by Synchrotron X-ray Microdiffraction: *Arief Budiman*¹; Nan Li²; Lucas Berla³; Martin Kunz⁴; Nobumichi Tamura⁴; William Nix³; Jian Wang²; Amit Misra²; ¹Singapore University of Technology & Design (SUTD); ²LANL; ³Stanford University; ⁴Advanced Light Source (ALS)

Multiscale Approaches to Hydrogen-assisted Degradation of Metals — Overcoming HE in Service II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Nicholas Winzer, Fraunhofer IWM; Matous Mrovec, Fraunhofer IWM; Brian Somerday, Sandia National Laboratories; Petros Sofronis, University of Illinois; David Bahr, Purdue University; Srinivasan Rajagopalan, ExxonMobil Research and Engineering Company

Thursday PM
February 20, 2014

Room: 11B
Location: San Diego Convention Center

Session Chairs: Neeraj Thirumalai, ExxonMobil Research and Engineering Company; Oliver Rott, ThyssenKrupp Steel Europe AG

2:00 PM Invited

Hydrogen- assisted Degradation of Steels Used in Various Market Segments: *Zinedine Zermout*¹; Lode Duprez²; ¹ArcelorMittal Global R&D Gent/OCAS NV; ²OCAS/ArcelorMittal Global R&D Gent

2:40 PM

Hydrogen Effects on the Material Characteristics of Pulse-plated Nickel: *Eggert Reese*¹; Torsten Sebald²; Georgios Paronis²; ¹EADS Innovation Works; ²Astrium Space Transportation

3:00 PM

Effect of Thermal Up-quenching on Internal Hydrogen Embrittlement of Hot Dip Galvanized High Strength Steel Fasteners: *Salim Brahim*¹; ¹McGill University / IBECA Technologies

3:20 PM Break

3:40 PM

Hydrogen Embrittlement of High Strength Advanced Oilfield Alloys: *Indranil Roy*¹; Manuel Marya¹; Xinghang Zhang²; ¹Schlumberger; ²Texas A&M University

4:00 PM Invited

Hydrogen Embrittlement in Precipitation Strengthened Ni-base Superalloys: *Samuel Kernion*¹; John Magee¹; Thomas Werley¹; Mark Burton¹; Paul Maxwell¹; Brian Somerday²; ¹Carpenter Technology Corporation; ²Sandia National Laboratories



Multiscale Perspectives on Plasticity in HCP Metals — Multiscale Modeling

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

Program Organizers: Benjamin Morrow, Los Alamos National Laboratory; Suveen Mathaudhu; Ellen Cerreta, Los Alamos National Laboratory; Juan P. Escobedo, The University of New South Wales Canberra; Dallas Trinkle, University of Illinois, Urbana-Champaign

Thursday PM
February 20, 2014

Room: 6C
Location: San Diego Convention Center

Session Chair: Dallas Trinkle, University of Illinois, Urbana-Champaign

2:00 PM Invited

A Multiscale Approach towards Internal Strain Predictions in Hexagonal Materials: *Laurent Capolungo*¹; Nicolas Bertin¹; Pierre Alexandre Juan¹; Stephane Berbenni²; Carlos Tome³; ¹Georgia Institute of Technology; ²Laboratoire d'Etude des Microstructures et de Mecanique des Materiaux, UMR CNRS 7239; ³Los Alamos National Laboratory

2:20 PM

Ab Initio Modelling of Secondary Slip in Zirconium: *Nermine Chaari*¹; Emmanuel Clouet¹; David Rodney²; ¹CEA, Saclay; ²INP Grenoble

2:40 PM

Prismatic Glide in Titanium and Zirconium from Ab Initio Calculations: *Emmanuel Clouet*¹; Alexandre Prieur¹; ¹SRMP, CEA Saclay

3:00 PM

Stability and Dynamics of Self-interstitial Atom Clusters in hcp Materials: *Gopinath Subramanian*¹; Danny Perez¹; Blas Uberuaga¹; Arthur Voter¹; ¹Los Alamos National Laboratory

3:20 PM Invited

Formation of Long Periodic Stacking Orders in Mg Alloys: *Zi-Kui Liu*¹; Bill Y Wang¹; Yi Wang¹; ShunLi Shang¹; Kristopher A. Darling Darling²; Laszlo Kecskes²; Suveen Mathaudhu; ¹The Pennsylvania State University; ²US Army Research Laboratory

3:40 PM Break

4:00 PM Invited

Twinning in Mg from First Principles: *Maryam Ghazisaeidi*¹; W. Curtin¹; ¹EPFL

4:20 PM

Atomic-scale Comparison between {-1101} and {-1102} Twin Growth Mechanisms in Magnesium: *Laura Leclercq*¹; Laurent Capolungo¹; David Rodney²; ¹Georgia Tech Lorraine; ²INP Grenoble

4:40 PM

Large Scale Molecular Dynamics Simulations of the Effect of Dislocation Density on Twinning in c-Axis Compression of Magnesium Single Crystals: *Yizhe Tang*¹; *Jaafar El-Awady*¹; ¹Johns Hopkins University

5:00 PM

The Nucleation, Core Structure, and Slip of Pyramidal Dislocations in HCP Magnesium: A Molecular Dynamics Study: *Yizhe Tang*¹; *Jaafar El-Awady*¹; ¹Johns Hopkins University

Nanoparticulate Materials: Production, Consolidation and Characterization — Novel Synthesis, Processing and Characterization

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

Program Organizers: Brady Butler, U.S. Army Research Laboratory; Eugene Olevsky, San Diego State University

Thursday PM
February 20, 2014

Room: Carlsbad
Location: San Diego Marriott Marquis & Marina

Session Chair: Brady Butler, US Army Research Laboratory

2:00 PM Invited

Nano-orientation Mapping of Ultrafine Grained and highly Constrained Non-ferrous Structural Metallic Alloys: Iman Ghamarian¹; Yue Liu¹; *Peter Collins*¹; ¹University of North Texas

2:30 PM Invited

Control of Nanoprobe Configurations for Electrode Applications: *Jirapon Khamwannah*¹; Calvin Gardener¹; Patrick Mercier²; Sungho Jin¹; ¹Materials Science and Engineering, University of California, San Diego; ²Electrical and Computer Engineering Department, University of California, San Diego

3:00 PM

Magnetic Shape Memory Nanotubes for Targeted Drug Delivery: *Spomenka Kobe*¹; ¹Jožef Stefan Institute

3:20 PM

Influence of Passivation on Aging of Nano-aluminum- Heat Flux Calorimetry and Microstructural Studies: *Sreekumar Pisharath*¹; Zhang Fan¹; How Ghee Ang¹; ¹Energetics Research Institute

3:40 PM Break

4:00 PM Invited

Nanoparticles for Energy Applications: *Sungho Jin*¹; ¹University of California San Diego

4:30 PM

Biogenesis of Silica Nanoparticles from Rice Husk Ash by the Action of Fusarium Oxysporum: Tatiana Pineda-Va'squez¹; Mabel Torres-Taborda²; Margarita Ramirez-Camona²; Ana Casas-Botero²; Carlos Lemos Soares¹; *D. Hotza*¹; ¹UFSC; ²UPB

4:50 PM

Production of Silica Nanoparticles from Agroindustrial Waste and Its Use as Reinforcement in a Polymer Nanocomposite: *Angel Ortiz*¹; Jaciele Teixeira¹; Michele Gomes¹; Rene Oliveira¹; Esperidiana Moura¹; ¹Nuclear and Energy Research Institute, IPEN-CNEN/SP

5:10 PM

Sintering Atmosphere and Solid-vapor Reactions in Nano-tungsten Processing: *Brady Butler*¹; Joseph Marsico²; David Runk³; Bradley Klotz²; ¹U.S. Army Research Laboratory; ²US Army, Science and Engineering Apprenticeship Program (SEAP); ³Bowhead Science and Technology

Nanostructured Materials for Rechargeable Batteries and Supercapacitors II — Session VIII

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: David Millin, University of Alberta and NINT NRC; Reza Shahbazian-Yassar, Michigan Technological University; Peter Kalisvaart, University of Alberta and NINT NRC

Thursday PM
February 20, 2014

Room: Ballroom F
Location: San Diego Marriott Marquis & Marina

Session Chairs: Shen Dillon, University of Illinois; William Chueh, Stanford University

2:00 PM Invited

Synthesis and Characterization of Oxide Nanowire Electrodes: *Shen Dillon*¹; ¹University of Illinois at Urbana-Champaign

2:15 PM Invited

PEG and Fluoroalkyl Functionalized Ionic Liquids as Electrolyte Solvents for Lithium Ion Batteries: *Sitaraman Krishnan*¹; Lin Wu¹; Dipankar Roy²; Simon Rock²; ¹Department of Chemical & Biomolecular Engineering, Clarkson University; ²Department of Physics, Clarkson University

2:30 PM Invited

Nanocrystalline Anatase TiO₂: a New Anode Material for Rechargeable Sodium Ion Batteries: *David Mitlin*¹; Yang Xu¹; ¹University of Alberta

2:45 PM Invited

Nanoscale Visualization of Intercalation in Many Particle LiFePO₄ Electrodes: *William Chueh*¹; ¹Stanford University

3:00 PM Invited

Modeling Fracture and Failure in Si Thin Film Nanoelectrodes on Substrates: *Huajian Gao*¹; ¹Brown University

3:15 PM Invited

Nanostructured Solid Electrolyte for All-solid Lithium-sulfur Batteries: *Chengdu Liang*¹; Zhan Lin¹; Zengcai Liu¹; Nancy Dudney¹; ¹Oak Ridge National Laboratory

3:30 PM Invited

Interconnected Carbon Nanosheets Derived from Hemp for Ultrafast Supercapacitors with High Energy: *David Mitlin*¹; Huanlei Wang¹; Zhi Li¹; ¹University of Alberta and NINT NRC

3:45 PM Break

4:00 PM

In Operando Measurement of Strain Evolution by X-ray Diffraction in Bicontinuous NiSn Inverse Opal Anodes for Lithium Ion Batteries: *Matthew Glazer*¹; Jiung Cho²; Jonathan Almer³; John Okasinski³; Paul Braun²; David Dunand¹; ¹Northwestern University; ²University of Illinois at Urbana-Champaign; ³Argonne National Laboratory

4:15 PM

FeWO₄: An Anode Material for Sodium-ion Batteries: *Wei Wang*¹; Weiyi Xiong¹; He Sun¹; Shuqiang Jiao¹; ¹University of Science and Technology Beijing

4:30 PM

High Electrochemical Performance Li₄Ti_{5-x-y}NbxCryO₁₂ (0=x+y=0.075) as an Anode Material for Lithium-ion Battery: *Chun-Kai Lan*¹; Bing-Hong Chen¹; Hao Yang¹; Jenq-Gong Duh¹; ¹National Tsing Hua University

4:45 PM

Asymmetric Supercapacitors with Dominant Pseudocapacitance Based on Manganese Oxide Nanoflowers in Neutral Aqueous Electrolyte: *Yuanbing Mao*¹; Qiang Li¹; ¹University of Texas-Pan American

5:00 PM Invited

Carbon Nanotube-nano Si Hybrids as Anode in Li-ion Battery: Sameer Chouksey¹; Gaurav Mittal¹; Debrupa Lahiri¹; *Indranil Lahiri*¹; ¹Indian Institute of Technology Roorkee

5:15 PM

Prospect of Carbon Nanotubes in Li-ion Battery: *Indranil Lahiri*¹; ¹Indian Institute of Technology Roorkee

Pb-free Solders and Emerging Interconnect and Packaging Materials — Microstructure Evolutions

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch Automotivte

Thursday PM
February 20, 2014

Room: 5B
Location: San Diego Convention Center

Session Chair: Chang-Woo Lee, Korea Institute of Industrial Technology

2:00 PM

The Effects of Different Substrate Areas on Instantaneous Microstructure and Associated Temperature Distribution under Current Stressing in Electronic Solder Joints: *Xu Zhang*¹; Qian Liu¹; Limin Ma¹; Fu Guo¹; Andre Lee²; K. N. Subramanian²; ¹Beijing University of Technology; ²Michigan State University

2:20 PM

Kinetics of the Polymorphic Phase Transformation of Cu₆Sn₅: *Guang Zeng*¹; Stuart McDonald¹; Qinfen Gu²; Stoichi Suenaga³; Kazuhiro Nogita¹; ¹The University of Queensland; ²The Australian Synchrotron; ³Nihon Superior Co., Ltd

2:40 PM

Phase Evolution and Nanomechanical Properties of Intermetallic Compounds in Solid-liquid Interdiffusion Bonding: *Jenn-Ming Song*¹; Tsung-Yun Pai¹; Wei-Chih Lu²; ¹National Chung Hsing University; ²National Dong Hwa University

3:00 PM

Microstructurally Adaptive Composite Model for Creep of Sn-Ag Based Solders with Large Proeutectic Content: *Babak Talebanpour*¹; Uttara Sahaym¹; Indranath Dutta¹; ¹Washington State University

3:20 PM Break

3:40 PM

Micromechanical Investigation of Lead-free Solder Joints in Microelectronics: *Bastian Philipp*¹; Andreas Schießl²; Angelika Schingale³; Gerhard Dehm⁴; ¹Materials Center Leoben Forschung GmbH; ²Continental Automotive GmbH; ³Continental Automotive GmbH; ⁴Max-Planck-Institut für Eisenforschung GmbH

4:00 PM

The Dependence of the Solidification Temperature and Sn Grain Morphology of SnAg Solder Bumps on Geometry and Composition: *Greg Parks*¹; Eric Perfecto²; Minhua Lu²; Eric Cotts¹; ¹Binghamton University; ²IBM T. J. Watson Research Center



Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIII — Microelectronics Reliability II

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Alloy Phases Committee

Program Organizers: Chao-hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikuo Ohnuma, Tohoku University; Clemens Schmetterer, Forschungszentrum Juelich, Inst.; Yee-Wen Yen, National Chung Cheng University; Shien Ping Feng, The University of Hong Kong; Shih-Kang Lin, National Cheng Kung University

Thursday PM
February 20, 2014

Room: 32A
Location: San Diego Convention Center

Session Chairs: Shih-Kang Lin, National Cheng Kung University; Chao-Hong Wang, National Chung Cheng University

2:00 PM

Thermal Stability of Ruthenium Schottky Contact with 4H-SiC under Vacuum Annealing: *Kinnock Munthal*¹; Chris Theron¹; F. Danie Aurret¹; ¹University of Pretoria

2:20 PM

Ga-based Cu-to-Cu Interconnection with Pt UBM: *Hao-miao Chang*¹; Cheng-liang Cho¹; Yi-kai Kuo¹; Shih-kang Lin¹; ¹National Cheng Kung University

2:40 PM

Experimental Investigation and Thermodynamic Modeling of the Ternary Pb-Bi-Te System: *Md. Arifur Rahman*¹; Wojciech Gierlotka¹; ¹Yuan Ze University

3:00 PM

Establish Electromigration-induced Failure Map for Flip-chip Sn/Cu Cathode Interface: *Yi Chun Hsu*¹; C. Y. Liu¹; ¹National Central University

3:20 PM

In Situ TEM Study on Au Mediated Growth of NiSi₂ in Si Nanowire: A Vapor-liquid-solid Analogy: *Wei Tang*¹; Tom Picraux²; Xiaohua Liu³; King-Ning Tu¹; Shadi Dayeh⁴; ¹UCLA; ²Los Alamos National Laboratory; ³Sandia National Laboratories; ⁴University of California, San Diego

3:40 PM Break

4:00 PM

Anodic Electrodeposition of Nanoporous Nickel Hydroxide with a Facile Patterning Technique: *YaHuei Chang*¹; ShienPing Feng¹; ¹Hong Kong University

4:20 PM

Shear-strength Improvement of ENIG/Sn-Bi/Ag/Cu Sandwich Structure by Doping Ag, Cu, or Zn Metals: *Yu-Jin Hu*¹; Cheng-Yi Liu¹; ¹National Central University

4:40 PM

Characterization of Interfacial Reactions in Cu/In/Ni Joints at 280 °C: *Yu-hsiang Wang*¹; Hui-chin Kuo¹; Shih-kang Lin¹; ¹National Cheng Kung University Department of Material Science and Engineering

Phase Transformation and Microstructural Evolution — Phase Transformations Induced by Irradiation II

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM; Phase Transformations Committee

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Thursday PM
February 20, 2014

Room: 31B
Location: San Diego Convention Center

Session Chairs: Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Osman Anderoglu, Los Alamos National Laboratory

2:00 PM Invited

Multiscale Modeling of Nanoscale Precipitate Stability in Irradiated Structural Materials: *Brian Wirth*¹; Donghua Xu¹; Alicia Certain²; ¹University of Tennessee; ²Pacific Northwest National Laboratory

2:30 PM

An Insight into the Mechanism of SFT Formation Near 1/2<110> Edge Dislocations in Aluminum Exposed to Irradiation: *Roman Voskoboynikov*¹; ¹ANSTO

2:50 PM

Effect of Point-defect Sinks on Compositional Patterning Under Irradiation: *Pascal Bellon*¹; Robert Averback¹; Shipeng Shu¹; Xuan Zhang¹; ¹University of Illinois

3:10 PM

Canonical Bias Monte Carlo for Charged Systems: Daniel Schwen¹; Alfredo Caro¹; ¹Los Alamos National Laboratory

3:30 PM

Understanding Interface Effects on Phase Stability of a Ni/Ni₃Al Multilayer Under Ion Irradiation: *C. Sun*¹; O. Anderoglu¹; B. Ueberuaga¹; A. Misra¹; S. A. Maloy¹; ¹Los Alamos National Laboratory

Phase Transformation and Microstructural Evolution — Processing and Microstructural Evolution III

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM; Phase Transformations Committee

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

Thursday PM
February 20, 2014

Room: 31C
Location: San Diego Convention Center

Session Chairs: Paul Gibbs, Los Alamos National Laboratory; Seth Imhoff, Los Alamos National Laboratory

2:00 PM

Spray Cooling of Early Extracted Hot Stamped Parts: *Florian Nürnberger*¹; Max Diekamp¹; Jörn Moritz¹; Lars Wolf¹; Sven Hübner¹; Bernd-Arno Behrens¹; ¹Leibniz Universität Hannover

2:20 PM

Influence of Laser Surface Hardening Treatment on Mechanical Properties of Low Carbon Automotive Grade Steels: *Badirujjaman Syed*¹; SM Shariff²; G Padmanabham²; S Kundu¹; ¹Tata Steel Ltd; ²ARCI

2:40 PM

Influence of Cryogenic Treatment on Microstructure Characteristics and Mechanical Properties of AISI D2 Tool Steel: *Hadi Ghasemi Nanasa*¹; Mohammad Jahazi¹; ¹École de Technologie Supérieure

3:00 PM

Development of a Stainless Steel as Bipolar Electrode Plate Material for PEM Fuel Cells: *Selçuk Kuyucak*¹; ¹Dept. of Natural Resources Canada

3:20 PM Break

3:35 PM

Influence of Aging Treatment on In Situ Electrical Resistance Variation during Aging of Nickel-Rich NiTi Shape Memory Wires: *Kamel Kazemi-Choobi*¹; Jafar Khalil-Allafi¹; *Amin Elhami*²; Parviz Asadi²; ¹Research Center for Advanced Materials and Mineral Processing, Faculty of Materials Engineering, Sahand University of Technology; ²Department of Mechanical Engineering, Central Tehran Branch, Islamic Azad University

3:55 PM

The Study of Phase Transformations in Metastable Beta-Ti Alloys by Electrical Resistivity Measurement: *Petr Hrcuba*¹; Michal Hájek¹; Jana Šmilauerová¹; Pavel Zhánal¹; ¹Charles University in Prague

4:15 PM

Elinvar Effect Caused by Ferroelastic Nano Domains in Strain Glasses: *Liangxiang Zhang*¹; Dong Wang¹; Xiaobing Ren²; Yunzhi Wang³; ¹Center of Microstructure Science, Multi-Disciplinary Materials Research Center, Frontier Institute of Science and Technology, State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University; ²Ferrous Physics Group, National Institute for Materials Science; ³Department of Materials Science and Engineering, The Ohio State University

4:35 PM

Spontaneous Transition and Hidden Order in Doped Ferroelastic Systems: *Junyan Zhang*¹; ¹Xi'an Jiaotong University

4:55 PM

Solid-liquid Phase Transitions of Fe: From Nano Particle to Bulk and from Spontaneous to Induced Solidifications: *Yongquan Wu*¹; Rong Li¹; Tong Shen¹; ¹Shanghai University

5:15 PM

Evolution of the Structure Morphology of Fe-5 wt.%Mn Alloy during Directional Solidification: *Wei Lu*¹; ¹Shanghai University

Radiation Effects in Oxide Ceramics and Novel LWR Fuels — Novel Fuels, Pellet-cladding Interaction, and Modeling

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

Program Organizers: Xian-Ming Bai, Idaho National Laboratory; Todd Allen, Idaho National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Jianliang Lin, Colorado School of Mines; Michele Manuel, University of Florida; Dragos Staicu, European Commission, Joint Research Centre, Institute for Transuranium Elements; Yong Yang, University of Florida

Thursday PM
February 20, 2014

Room: 33B
Location: San Diego Convention Center

Funding support provided by: The Center for Materials Science of Nuclear Fuel (CMSNF), an Energy Frontier Research Center led by the Idaho National Laboratory

Session Chairs: Yong Yang, University of Florida; Yongfeng Zhang, Idaho National Laboratory

2:00 PM Invited

Irradiation Behavior of High-burnup LWR-MOX (Mixed-Oxide) Fuels: *Masaki Amaya*¹; ¹Japan Atomic Energy Agency

2:30 PM

Characterization of MOX Fuel Pellets by Photothermal Microscopy: *Facundo Zaldivar Escola*¹; Dario Kunik²; *Oscar Martinez*¹; Nelida Mingolo¹; Rodolfo Kempf³; ¹Universidad de Buenos Aires; ²Toltek SRL; ³Comisión Nacional de Energía Atómica

2:50 PM Invited

Reflections on Fuel Pellet-cladding Interaction (PCI): *Dion Sunderland*¹; ¹ANATECH Corp

3:20 PM

Doping d-UO₂ Fuel Pellets for Improved Hardness and Fracture Toughness at High Temperatures: *Robert McDonald*¹; Harn Lim¹; Matthew Catlett¹; Karin Rudman¹; Rafael Leckie²; Erik Luther²; Andrew Nelson²; Pedro Peralta¹; ¹Arizona State University; ²Los Alamos National Laboratory

3:40 PM Break

4:00 PM

Understanding Irradiation Induced Changes in Structure and Thermal Properties of UO₂ Grain Boundaries: *Tianyi Chen*¹; Lin Shao¹; ¹Texas A&M University

4:20 PM

Calculations of Threshold Displacement Energies in Y₂Ti₂O₇ and Y₂TiO₅: *Marc Robinson*¹; Nigel Marks¹; Meng Qin²; Simon Middleburgh²; Gordan Thorogood²; Greg Lumpkin²; Damien Carter¹; ¹Curtin University; ²Australian Nuclear Science & Technology Organisation

4:40 PM

Radiation Resistance of Nickel, Iron, Chromium Spinels by MD Simulations: *laurent Van Brutzel*¹; Pierre Alvarez¹; Alain Chartier¹; ¹CEA

Recycling and Sustainability Update — Waste

Sponsored by: TMS Extraction and Processing Division, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Randolph Kirchain, Massachusetts Institute of Technology; Jeff Spangenberg, Argonne National Laboratory

Thursday PM
February 20, 2014

Room: 16B
Location: San Diego Convention Center

Session Chairs: Randolph Kirchain, Massachusetts Institute of Technology; Jeffrey Spangenberg, Argonne National Laboratory

2:00 PM

Characterization of Components of Liquid Crystal Displays: The End-of-life Management: *Tatiana Moreno*¹; Priscilla Hanashiro¹; Hugo Hashimoto¹; Viviane Moraes¹; Jorge Tenório¹; *Denise Espinosa*¹; ¹Escola Politécnica da Universidade de São Paulo

2:20 PM

Kinetics and Equilibrium Studies for the Removal of Tannin Acid from Aqueous Solutions by Regeneration Activated Carbon: *Aiyuan Ma*¹; *Libo Zhang*¹; Jinhui Peng¹; Hongying Xia¹; Chenyu Sun¹; Yongguang Luo¹; Tu Hu¹; Yonggang Zuo¹; ¹Yunnan Provincial Key Laboratory of Intensification Metallurgy, Key Laboratory of Unconventional Metallurgy, Ministry of Education

2:40 PM

Recovery of Copper and 1,Hydroxyethane-1,1-Diphosphonic Acid (HEDP) from Cyanide-free Electroplating Wastewater by Electrodialysis: *Tatiana Scarazzato*¹; Daniella Buzzi¹; Andrea Bernardes²; Jorge Tenorio¹; Denise Espinosa¹; ¹University of Sao Paulo; ²Federal University of Rio Grande do Sul

3:00 PM

The Life Cycle Assessment of Copper Metallurgical Processes: *Xie Yang*¹; Xiangxin Hao¹; *Hongxu Li*¹; Shiwei Sun¹; ¹University of Science and Technology

3:20 PM Invited

Reuse of Ornamental Rock Waste for Manufacture of Mortars: *Afonso Azevedo*¹; Jonas Alexandre¹; Gustavo Xavier¹; Sergio Monteiro²; Carlos Mauricio Vieira¹; ¹UENF; ²IME

3:40 PM Break

4:00 PM Invited

Dynamic Adsorption Behavior of Aqueous Vanadium onto Anion Exchange Resin: *Cui Li*¹; ¹Chongqing University



4:20 PM

Synthesis Process and Production Properties of Forsterite-based Refractory from Iron Ore Tailings: *Jing Li*¹; *Qi Wang*¹; ¹University of Sci.&Tec.Liaoning, China

4:40 PM

Zinc Oxide Preparation Using Rotary Hearth Furnace Secondary Dust: *Huiqing Tang*¹; ¹University of Science and Technology Beijing

5:00 PM

The Estimation of Waste Packaging Containers Generated by Households in Taiwan: *Esher Hsu*¹; *Chen-Ming Kuo*²; ¹National Taipei University; ²I-Shou University

Shape Casting: 5th International Symposium — Solidification and Microstructure II

Sponsored by: TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS: Aluminum Committee, TMS: Solidification Committee
Program Organizers: Murat Tiryakoglu, University of North Florida; John Campbell, University of Birmingham; Glenn Byczynski, Nemak Canada

Thursday PM

February 20, 2014

Room: 17B

Location: San Diego Convention Center

Session Chair: To Be Announced

2:00 PM

Reduced Pressure Test (RPT) for Bilim Assessment: *Derya Dispinar*¹; John Campbell²; ¹Istanbul University; ²University of Birmingham

2:20 PM

Prediction of Misruns in Thin Wall Castings Using Computational Simulation: *Juergen Jakumeit*¹; Emir Subasic¹; Matthias Bünck¹; ¹Access e.V.

2:40 PM

Shaping of Metals with Magnetic Fields: *Maria Diana David*¹; Charles Monroe¹; John Griffin¹; ¹University of Alabama at Birmingham

3:00 PM

The Formation of Hydrogen Related Porosity by Double Oxide Film Defects in Al Alloys: Alex Gerrard¹; *William Griffiths*²; ¹Alcoa Aerospace, Transportation and Industrial (Kitts Green); ²University of Birmingham

3:20 PM

The Influence of Fe, Mn and Cr Additions on the Formation of Iron-rich Intermetallic Phases in Al-Si Die-casting Alloys: Alberto Fabrizi¹; Stefano Ferraro¹; *Giulio Timelli*¹; ¹University of Padua

3:40 PM Break

3:55 PM

The Sr Effect on the Intermetallic Phase of Eutectic Al-Si Alloy: *Jeyakumar Manickaraj*¹; Anton Gorny¹; Sumanth Shankar¹; ¹McMaster University

4:15 PM

Thin Wall Model for Use in Multiple Casting Conditions: *Alexander Noble*¹; Charles Monroe¹; Alexander Monroe²; ¹University of Alabama at Birmingham; ²MAGMA Foundry Technologies

4:35 PM

Electrochemical Behavior of Al-1wt.%Cu and Al-4.5wt.%Cu Alloys: Alejandra Roman¹; Claudia Méndez¹; *Carlos Schvezov*¹; Alicia Ares¹; ¹Materials Institute of Misiones (IMAM)-Faculty of Sciences (FCEQyN-UNaM)

Solar Cell Silicon — Silicon Refining II

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Conversion and Storage Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Gabriella Tranel, Norwegian University of Science & Technology; Yulia Meteleva-Fischer, Materials Innovation Institute M2i; Arjan Ciftja, SINTEF; Shadia Ikhmayies, Al Isra University

Thursday PM

February 20, 2014

Room: Balboa

Location: San Diego Marriott Marquis & Marina

Session Chairs: Yulia Meteleva-Fischer, Materials Innovation Institute M2i; Shadia Ikhmayies, Al Isra University

2:00 PM

Effective Boron Removal by Calcium Silicate Slags Combined with Solvent Refining: *Kazuki Morita*¹; Xiaodong Ma¹; Takeshi Yoshikawa¹; ¹The University of Tokyo

2:25 PM

Distribution of Boron, Calcium and Aluminium between Silicon and CaO-Al₂O₃-SiO₂ Slags: *Lars Klemet Jakobsson*¹; Merete Tangstad¹; ¹NTNU

2:45 PM

Research on the Forecast Model of the Boron Removal from Metallurgical Grade Silicon by Slag Refining Based on GA-BP Neural Network: *Shilai Yuan*¹; Huimin Lu¹; Zhijiang Gao¹; Liyuan Zhao¹; ¹Beihang University

3:05 PM

Purification of Solar-grade Silicon by Induction Melting in Cold Crucible: Yuriy Cherpak¹; *Iryna Buchovska*¹; Anatoly Shkulkov¹; Bjorn Henriksen²; Ragnar Tronstad²; Timur Vlasenko³; ¹Pillar Ltd.; ²Elkem Technology; ³Solin Development B.V.

3:25 PM

A New Centrifuge CVD Reactor that will Challenge the Siemens Process: *Hallgeir Klette*¹; Trygve Mongstad¹; Werner Filtvedt¹; Sverre Sørensen²; Josef Filtvedt²; Arve Holt¹; ¹Department of Solar Energy, Institute for Energy Technology (IFE); ²Dynatec Engineering

3:45 PM Break

4:05 PM

Theoretical Aspects on Pushing and Engulfment of SiC Particles during Directional Solidification Experiments with Molten Silicon: Arjan Ciftja¹; *Orion Ciftja*²; ¹SINTEF; ²Prairie View A&M University

4:25 PM

Effects of Solidification Rate and Settling Time of SiC Particles on the Macrosegregation of Carbon in Silicon Ingots: *Tiago Ribeiro*¹; João Neto¹; Marcelo Martorano²; ¹Institute for Technological Research; ²University of Sao Paulo

4:45 PM

Separation of Si and SiC Microparticles of Solar Grade Silicon Cutting Slurry by Micropore Membrane: *Suning Liu*¹; Kai Huang¹; Hongmin Zhu¹; ¹University of Science and Technology Beijing

5:05 PM

Characterization of Silicon Nanoparticles Incorporated into Metal-coated Carbon Fiber and Nanotube Arrays: *Mohamad Zbib*¹; David Bahr¹; ¹Purdue University

Solid-state Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment — Grain Boundaries II

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Xiang-Yang Liu, Los Alamos National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Stephen Foiles, Sandia National Laboratories; Mitra Taheri, Drexel University; Rampi Ramprasad, University of Connecticut

Thursday PM
February 20, 2014

Room: 4
Location: San Diego Convention Center

Session Chair: Douglas Medlin, Sandia National Labs

2:00 PM Invited

The Effect of Stress-coupled Grain Boundary Migration on the Mechanical Response of Nanocrystalline Thin Films: Paul Rottmann¹; Suman Dasgupta¹; Saritha Samudrala²; Frederic Momprou³; Marc Legros⁴; Julie Cairney²; *Kevin Hemker*¹; ¹Johns Hopkins University; ²University of Sydney; ³CEMES-CNRS; ⁴CEMES-CNRS

2:40 PM

Fluctuations in Pre-melted Grain Boundaries: *J. Hickman*¹; Y. Mishin¹; ¹George Mason University

3:00 PM

Line Tension of Grain Boundary Triple Junctions in the Copper Tricrystals: *Bingbing Zhao*¹; Lasar Shvindlerman¹; Günter Gottstein¹; ¹IMM, RWTH Aachen University

3:20 PM

In Situ Observation of Grain Boundary Network Development during Grain Boundary Engineering Processes: *Asher Leff*¹; Christopher Barr¹; Mitra Taheri¹; ¹Drexel University

3:40 PM Break

3:50 PM

Developing Grain Boundary Diagrams for Multicomponent Alloys: *Naixie Zhou*¹; Jian Luo¹; ¹University of California San Diego

4:10 PM

Investigation of Atomic-scale Energetics on Liquid Metal Embrittlement of Aluminum Due to Gallium: *Mansa Rajagopalan*¹; Mehul Bhatia¹; Kiran Solanki¹; Mark Tschopp²; ¹Arizona State University; ²Army Research Laboratory

4:30 PM

Measurements of Quadruple Node Distributions: *S.F. Li*¹; J. Mason¹; J. Lind²; M. Kumar¹; ¹Lawrence Livermore National Laboratory; ²Carnegie Mellon University

4:50 PM

The Unusual Effects of Bismuth Segregation on Nickel Grain Growth: *Yuanyao Zhang*¹; Denise Yin²; Zhiyang Yu²; Martin Harmer²; Jian Luo¹; ¹University of California, San Diego; ²Lehigh University

5:10 PM

Steady State Grain Growth: Implications for Microstructural Descriptors Beyond Grain Size Distributions: *Mukul Kumar*¹; Shiu-Fai Li¹; Thomas Lagrange¹; Jeremy Mason¹; Bryan Reed¹; Vasily Bulatov¹; ¹Lawrence Livermore National Laboratory

Solidification in Additive Manufacturing — Session II: Solidification in Complex and High Build Rate AM systems

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee, TMS/ASM: Phase Transformations Committee
Program Organizers: Jyoti Mazumder, University of Michigan; Rainer Hebert, University of Connecticut; James Sears, GE GRC; Iver Anderson, Ames Laboratory; Alan Luo, The Ohio State University

Thursday PM
February 20, 2014

Room: 15B
Location: San Diego Convention Center

Session Chair: James Sears, GE GRC

2:00 PM Invited

A Coupled Solidification-microstructural Model of Single-crystal Alloy CMSX-4 Processed through Scanning Laser Epitaxy for Turbine Engine Hot-section Component Repair: Ranadip Acharya¹; Rohan Bansal¹; Justin Gambone¹; *Suman Das*¹; ¹Georgia Institute of Technology

2:25 PM

Characterization of Functional Gradient Materials Fabricated Using Additive Manufacturing: *Craig Brice*¹; Ravi Shenoy¹; Allison Popernack²; ¹NASA Langley Research Center; ²Virginia Tech

2:45 PM

P-V Process Mapping of Ti-6Al-4V Microstructure across Two Additive Manufacturing Processes: Joy Gockel¹; *Jack Beuth*¹; Tim Horn²; Ola Harrysson²; Karen Taminger³; ¹Carnegie Mellon University; ²North Carolina State University; ³NASA Langley Research Center

3:05 PM

Microstructure and Texture Evolution in Laser Deposited FCC Alloys: *Guru Dinda*¹; Ashish Dasgupta¹; ¹Focus: HOPE

3:25 PM Break

3:45 PM

Using Combined EBSD-EDS to Characterize Solidification Microstructures in Additive Manufactured Materials: *Matt Nowell*¹; ¹EDAX

4:05 PM

Texture Development in Titanium Additive Manufactured Components: *Craig Brice*¹; Wesley Tayon¹; Adam Pilchak²; ¹NASA Langley Research Center; ²Air Force Research Laboratory

4:25 PM

Processing Considerations, Microstructures, and Properties of Ti-6Al-4V Fabricated by Laser Engineered Net Shaping: *Yuwei Zhai*¹; Hayley Sandgren¹; Diana Lados¹; ¹Worcester Polytechnic Institute

4:45 PM

Microstructure, Mechanical Properties and the Influence of Heat Treatment (T6) of AlSi₁₀Mg Alloy Fabricated by Selective Laser Melting: *Wei Wang*¹; ¹University of Birmingham



Symposium on High Entropy Alloys II — Other Properties

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Alloy Phases Committee

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; M. C. Gao, National Energy Technology Laboratory; S. N. Mathaudhu

Thursday PM
February 20, 2014

Room: 5A
Location: San Diego Convention Center

Session Chairs: Karin Dahmen, University of Illinois at Urbana Champaign; Wu Kai, Institute of Materials Engineering, National Taiwan Ocean University

2:00 PM Invited

Using the Statistics of Serrations in the Stress Strain Curves to Extract Materials Properties of Slowly-sheared High Entropy Alloys: Karin Dahmen¹; Xie Xie²; James Antonaglia¹; Marina Laktionova³; Elena Tabachnikova³; Junwei Qiao⁴; Jien Wei Yeh⁵; Che Wei Tsai⁶; Jonathan Uhl; Peter Liaw²; ¹University of Illinois at Urbana Champaign; ²University of Tennessee; ³B.I. Verkin Institute for Low Temperature Physics and Engineering; ⁴Taiyuan University of Technology; ⁵National Tsing Hua University

2:20 PM

Characterizing Multi-component Solid Solutions Using Order Parameters and the Bragg-Williams Approximation: Louis Santodonato¹; Peter Liaw²; ¹Oak Ridge National Laboratory; ²The University of Tennessee

2:30 PM Invited

The Influence of Alloy Composition on the Interrelationship between Microstructure Mechanical Properties of High Entropy Alloys with BCC/B2 Phase Mixtures: Brian Welk¹; Daniel Huber¹; Jacob Jensen¹; Gopal Viswanathan¹; Robert Williams¹; Peter Liaw²; Mark Gibson³; Daniel Evans⁴; Hamish Fraser¹; ¹The Ohio State University; ²University of Tennessee; ³CSIRO; ⁴AFRL/RX

2:50 PM

Microstructure, Phase Stability and Mechanical Behavior of Non-equiatom FeMnNiCoCr High Entropy Alloys: Cem Tasan¹; Konda Gokuldoss Pradeep¹; Mengji Yao¹; Hauke Springer¹; Dierk Raabe¹; ¹Max-Planck Institute for Iron Research

3:00 PM

Thermal Stability and Creep Studies of NiCoCrFe High Entropy Alloy: Praveen S¹; Raj Tilak²; B S Murty¹; Ravi Sankar Kottada¹; ¹Indian Institute of Technology Madras; ²National Institute of Technology Jamshedpur

3:10 PM Invited

Oxidation Behavior of High Entropy Alloy AlCoCrFeNi: Kuang-Tsan Chiang¹; ¹Southwest Research Institute

3:30 PM Break

3:50 PM Invited

The Oxidation Behavior of AlCoCrFeNi High-entropy Alloy at 1023-1323K (750-1050°C): Wu Kai¹; W.S. Chen¹; C.C. Sung¹; Z. Tang²; P.K. Liaw²; ¹Institute of Materials Engineering, National Taiwan Ocean University; ²Department of Materials Science and Engineering, University of Tennessee

4:10 PM

Strain-rate Effects on the Structure Evolution of High Entropy Alloys: Xie Xie¹; James Antonaglia²; Junpeng Liu³; Zhi Tang¹; Junwei Qiao⁴; Gongyao Wang¹; Yong Zhang³; Karin Dahmen²; Peter Liaw¹; ¹University of Tennessee; ²University of Illinois at Urbana Champaign; ³University of Science and Technology Beijing; ⁴Taiyuan University of Technology

4:20 PM Invited

Mixing Enthalpy for Alloys Including Al and Structural Enthalpy for High-entropy Alloys: Akira Takeuchi¹; Kenji Amiya¹; Takeshi Wada¹; Kunio Yubuta¹; Wei Zhang²; Akihiro Makino¹; ¹Tohoku University; ²Dalian University of Technology

4:40 PM Invited

Neutron Diffraction Studies on Creep Deformation Behavior in a High-Entropy Alloy CoCrFeMnNi Under High Temperature and Low Strain Rate: Wanchuck Woo¹; E-Wen Huang²; Jien-Wei Yeh³; Peter Liaw⁴; Hahn Choo⁴; ¹KAERI (Korea Atomic Energy Research Institute); ²National Central University; ³National Tsing Hua University; ⁴The University of Tennessee

5:00 PM Invited

The Hot Corrosion Resistance Properties of AlxFeCoCrNi: Shizhong Yang¹; Mohammad Habibi²; Li Wang²; Shengmin Guo²; Zhi Tang³; Peter Liaw³; Liuxi Tan¹; Cheng Guo¹; Michael Jackson¹; ¹Southern University and A&M College; ²Louisiana State University; ³University of Tennessee

5:20 PM

Tribological Properties of AlCoCrFeNi(Cu,Ti) High-entropy Alloys in High Concentration Hydrogen Peroxide Solution: Yuan Yu¹; Jun Wang¹; Jinshan Li¹; Hongchao Kou¹; Tiebang Zhang¹; Weimin Liu²; ¹State Key Laboratory of Solidification Processing; ²State Key Laboratory of Solid Lubrication

Ultrafine Grained Materials VIII — Alternative SPD and Surface Nanostructuring Methods

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Lavernia, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuning Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Thursday PM
February 20, 2014

Room: 6E
Location: San Diego Convention Center

Session Chairs: Yi Li, Institute of Metals Research; Anton Hohenwarter, Montanuniversität Leoben

2:00 PM Introductory Comments

2:05 PM

Engineering Refined Surface Microstructures Using Severe Plastic Deformation in Large Strain Extrusion Machining: Marzyeh Moradi¹; Saurabh Basu¹; M. Ravi Shankar¹; ¹University of Pittsburgh

2:20 PM

Nanocrystalline Surface Layer Enhancements through Thermo-mechanical Processed Two-dimensional Linear Plane-strain Machining of 316L Austenitic Stainless Steel: Yaakov Idell¹; Giovanni Facco¹; Andreas Kulovits²; Jorg Wiezorek¹; ¹University of Pittsburgh; ²Carnegie Mellon University

2:35 PM

Surface Nanocrystallization Method for the Improvement of Tribological Properties in 5XXX and 7XXX Al Alloys: D. Gonzalez-Medina¹; M. A. L. Hernandez-Rodriguez¹; E. Garcia-Sanchez¹; ¹Universidad Autónoma de Nuevo León -Facultad de Ingeniería Mecánica y Eléctrica

2:50 PM

Formation of Ultrafine Grain Structure Ti-6Al-4V Alloy by Ultrasonic Peening: Behrang Poorganji¹; Abhishek Telang¹; Iman Ghamarian²; Peyman Samimi²; Peter Collins²; Vijay Vasudevan¹; ¹University of Cincinnati; ²North Texas University

3:05 PM

Gradient Nanostructure and Residual Stress Induced by Ultrasonic Nanocrystal Surface Modification for High Strength and High Ductility 304 Austenitic Stainless Steel: Chang Ye¹; Abhishek Telang²; Amrinder Gill²; Zhong Zhou³; Seetha Mannava²; Dong Qian³; Vijay Vasudevan²; ¹University of Akron; ²University of Cincinnati; ³University of Texas at Dallas

3:20 PM

Grain Refinement and Growth in Copper Using Surface Mechanical Attrition Treatment at Cryogenic Temperatures: *Heather Murdoch*¹; Kristopher Darling¹; Mark Tschopp¹; Anthony Roberts¹; Tyler Cook¹; ¹Army Research Laboratory

3:35 PM Break

3:50 PM

Fatigue Strength of Low Carbon Steel with Ultrafine-grained Surface Layer: *Enrico Bruder*¹; Clemens Müller¹; ¹TU Darmstadt

4:05 PM

Mechanical Characterization of Electrodeposited CoNi Multilayers with a Bimodal Grain Size Distribution: *Matthew Daly*¹; Jon McCrea²; Brandon Bouwhuis²; Glenn Hibbard¹; Chandra Veer Singh¹; ¹University of Toronto; ²Integran Technologies Inc.

4:20 PM

Optimization of the Fatigue Limits of Ultrafine Grained Cu-Zn Alloys: *Zhenjun Zhang*¹; Jianchao Pang²; Xianghai An²; Peng Zhang²; Zhefeng Zhang²; ¹Institute of Metal Research Chinese Academy of Sciences; ²Institute of Metal Research Chinese Academy of Sciences

4:35 PM

Corrosion Behavior of Multiaxially Forged Ultrafine Grained 316L Stainless Steel: *Amev Vidvans*¹; Gajanan Chaudhari¹; ¹IIT Roorkee

4:50 PM

Texture of Hot-Rolled Copper after Twist Extrusion: *Marat Latypov*¹; Myoung-Gyu Lee¹; Yan Beygelzimer²; Denis Prilepo²; Yuri Gusar²; Hyoung Seop Kim¹; ¹Pohang University of Science and Technology (POSTECH); ²Donetsk Physics & Engineering Institute of the National Academy of Sciences of Ukraine

5:05 PM

Ultrafine Grained Al-Mg Alloys: Severe Plastic Deformation, Microstructure Evolution and Dynamic Strain Aging: *Shiteng Zhao*¹; Chenlu Meng¹; Weiping Hu¹; Günter Gottstein¹; ¹RWTH Aachen University

Ultrafine Grained Materials VIII — Applications of UFG Materials

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Lavernia, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Thursday PM
February 20, 2014

Room: 6F
Location: San Diego Convention Center

Session Chairs: Indranil Roy, Schlumberger; Malgorzata Lewandowska, Warsaw University of Technology

2:00 PM Introductory Comments

2:05 PM Invited

Superconductivity in Bulk Ultrafine-grained Metals Prepared by High-pressure Torsion: *Terukazu Nishizaki*¹; Seungwon Lee²; Kaveh Edalati²; Zenji Horita²; Tadahiro Akune¹; Nobuyoshi Sakamoto¹; Satoshi Iguchi³; Takahiko Sasaki³; ¹Kyushu Sangyo University; ²Kyushu University; ³Tohoku University

2:25 PM

High-pressure Torsion for Fabrication of High-strength and High-electroconductivity Al Micro-wires: *Jorge Cubero-Sesin*¹; Makoto Arita¹; Hiroyuki In²; Zenji Horita¹; ¹Kyushu University; ²Dyden Corporation

2:40 PM

Formation of Metastable Phases of Silicon Processed by High-pressure Torsion: *Yoshifumi Ikoma*¹; Kazuhiro Hayano¹; Kaveh Edalati¹; Katsuhiko Saito²; Qixin Guo²; Zenji Horita¹; ¹Kyushu University; ²Saga University

2:55 PM

Improvement of Strength in Biomedical β -Ti Alloy While Maintaining Low Young's Modulus through Severe Plastic Deformation: *Veronika Polyakova*¹; Svetlana Gatina²; Irina Semenova²; Ruslan Valiev²; ¹Ufa State Aviation Technical University; ²Ufa State Aviation Technical University

3:10 PM

Ultrafine Grained Ti-Nb Alloys for Orthopaedics: *Ajit Panigrahi*¹; *Thomas Wait*¹; Erhard Schafner¹; Matthias Bönisch²; Mariana Calin²; Jürgen Eckert²; Annett Gebert²; Werner Skrotzki³; Michael Zehetbauer¹; ¹University of Vienna; ²IFW Dresden; ³TU Dresden

3:25 PM

Modeling and Simulation of Mechanical Properties and Microstructure of SPD Nanostructured Ti-45Nb Biomaterials: *Bartosz Sulkowski*¹; Ajit Panigrahi²; Kadir Ozaltin³; Malgorzata Lewandowska³; Borys Mikulowski¹; Michael Zehetbauer²; ¹AGH University of Science and Technology; ²University of Vienna; ³University of Technology Warsaw

3:40 PM Break

3:55 PM

Industrial Application of Friction Stir Processing: *Andrey Rudskoy*¹; *Anton Naumov*¹; Evgenii Chernikov¹; Richard Jones²; ¹St.Petersburg State Polytechnic University; ²MTI Welding Technologies, Ltd.

4:10 PM

Cyclic Deformation Behavior and Fatigue Life of Laminated UFG Aluminium Sheet Materials Produced by ARB: *Heinz Werner Höppel*¹; Frank Kümmel¹; Tina Hausöl¹; Dorothea Amberger¹; Mathias Göken¹; ¹University Erlangen-Nürnberg

4:25 PM

Microimprinting of Ultrafine-grained AZ31 Mg Alloy Processed by High-pressure Torsion: *Jie Xu*¹; Bin Guo¹; Debin Shan¹; Terence Langdon²; ¹Harbin Institute of Technology; ²University of Southern California

4:40 PM

Influence of UFG Structure and Surface Roughness of Ti-6Al-4V on Quality of Diffusion Bonding: *Evgeniya Yakushina*¹; Alexey Reshetov¹; Andrzej Rosochowski¹; ¹Advanced Forming Research Centre, University of Strathclyde

4:55 PM

Assessing Hydrogen Embrittlement Susceptibility of Nanocrystalline Materials: *Indranil Roy*¹; Manuel Marya¹; Xinghang Zhang²; ¹Schlumberger; ²Texas A&M University



2014 Functional Nanomaterials: Synthesis, Properties and Applications — Poster Session

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Nitin Chopra, The University of Alabama; Terry Xu, The University of North Carolina at Charlotte; Jiyoung Kim, University of Texas at Dallas; Yuanbing Mao, University of Texas - Pan American; Ashwin Ramasubramaniam, University of Massachusetts Amherst; Jung-kun Lee, University of Pittsburgh; Ramki Kalyanaraman, The University of Tennessee, Knoxville; Stephen Turano, Georgia Tech Research Institute

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

Session Chairs: Nitin Chopra, The University of Alabama; Jiyoung Kim, The University of Texas at Dallas; Ramki Kalyanaraman, University of Tennessee; Terry Xu, The University of North Carolina at Charlotte; Yuanbing Mao, University of Texas - Pan American; Stephan Turano, Georgia Tech Research Institute; Jung-Kun Lee, University of Pittsburgh

K1: A Study on the Silver Nanowires by Means of an Ordered AAO Template and Inkjet-printing Technology: *Bong-Yong Jeong*¹; ¹KICET

K2: A Study on the Surface Characterization of Nb₂O₅ with Nanorods Substructure by Anodization: *Bong-Yong Jeong*¹; ¹KICET

K3: Advanced Display Applications of Quantum Dot Light Emitting Diodes by Cd-free Colloidal Quantum Dots: *Jiwan Kim*¹; Min Suk Oh¹; Christian Ippen²; Tonino Greco²; Armin Wedel²; Chul Jong Han¹; ¹Korea Electronics Technology Institute; ²Fraunhofer IAP

K4: Ag Nanowire Network for Flexible Transparent Conducting Electrodes: *Sung Ho Lee*¹; Haekyoung Kim¹; ¹Yeungnam University

K5: Beta-alumina: Synthesis and Characterization of a Solid Electrolyte: *Lorena Caliman*¹; Douglas Gouvêa¹; ¹USP - Universidade de São Paulo

K6: Characterization of Cobalt Aluminate Ceramic Ink for Ink-jet Printing: *Jin-Ho Kim*¹; Kyu-Sung Han¹; Woo-Suk Cho¹; ¹Korea Institute of Ceramic Engineering and Technology

K7: Effect of Barrierless Cu-alloy Film as a Buffer Layer on the Stability of Microelectronic Devices: *Chon-Hsin Lin*¹; ¹Asia-Pacific Institute of Creativity/Biotechnology

K8: First Principle Pressure Induced Phase Transition of Samarium Chalcogenides under Interaction Energy Consideration: *Shanker Chimouriya*¹; Dipak Adhikari¹; ¹Kathmandu University

K9: Incorporation of CNTs into TiO₂ Film Processed by Electrophoretic Deposition for Dye-sensitized Solar Cell Applications: *Yeon Sung Kim*¹; Eung Seok Lee¹; Young Gun Ko²; Bongyoung Yoo¹; Dong Hyuk Shin¹; ¹Hanyang University; ²Yeungnam University

K10: Investigation of Room Temperature Ferromagnetism in Transition Metal Ion Incorporated Titania Thin Films: *Sudesh Sharma*¹; Sujeeet Chaudhary²; Subhash C Kashyap²; ¹University of Petroleum and Energy Studies; ²IIT Delhi

K11: Morphological Properties of High Purity Ga₂O₃ Nanomaterials Prepared by Controlled Precipitation: *Kyusung Han*¹; Jinho Kim¹; Kwangtaek Hwang¹; Woosuk Cho¹; Suhyun Hwang²; Youngjong Choi²; Deokil Jeon²; ¹Korea Institute of Ceramic Engineering and Technology; ²TSM Co., Ltd.

K12: Nano-texturization for Light Trapping in Crystalline Silicon Solar Cells: Can Periodic Beat Random?: Pingqi Gao¹; Hongzhe Wang¹; *Jichun Ye*¹; ¹Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences

K13: Preparation of CuCr_{1-x}Fe_xO₂ Delafossite Solid Solution Powder Via a Self-combustion Glycine Nitrate Process: *Te-Wei Chiu*¹; Yi-Ting Chen¹; Yu-Shan Lu¹; Sea-Fue Wang¹; ¹National Taipei University of Technology

K14: Reinforcing Effects of Graphenes in Copper Matrix Composites: *Haneul Jang*¹; Donghyun Bae²; Hyunjoo Choi¹; Seun Shin²; ¹Kookmin

University; ²Yonsei University

K15: Single ZnO Nanowire as Hydrogen Gas Sensor: *Marlene Cardoza*¹; Jose Romo¹; Rafael Garcia²; Oscar Contreras¹; ¹Centro de Nanociencias Y Nanotecnologia de La Unam ; ²Universidad de Sonora

K16: The Research of CeO₂ Nanopowder Preparation by Using Supercritical Water Oxidation: *Hongxu Li*¹; Chao Li¹; Chuanqi Jiao¹; Xie Yang¹; Yu Chen¹; ¹University of Science and Technology

K17: The Synthesis and Study on the L-cysteine-capped CdTe Nanocrystals: *Yongqiang Cao*¹; Ping Yang¹; ¹University of Jinan

K18: Thermal Properties of Electrophoresis Deposition Fabricated Nanodiamond Arrays: *Siheng Su*¹; Jingjing Qiu¹; ¹Texas Tech University

K19: Thermal Stability of Pulsed Electroplating Nanotwinned Copper: *Dai-Yang Lee*¹; Yi-Sa Huang¹; Yi-Cheng Chu¹; Chih Chen¹; ¹National Chiao Tung University

2014 TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications — Poster Session

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Nuggeshalli Ravindra, New Jersey Institute of Technology; Ramki Kalyanaraman, University of Tennessee; Halyan Wang; Yuntian Zhu, North Carolina State University; Justin Schwartz, North Carolina State University; Amit Goyal, Oak Ridge National Laboratories

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

Session Chairs: Sudhakar Nori, North Carolina State University; Ravindra Nuggeshalli, New Jersey Institute of Technology

K20: Effect of Growth Parameters on Electrical and Optical Properties of Ga and Al Doped Transparent Conducting Zinc Oxide Thin Films: Structure-property Correlations: *Namik Temizer*¹; Sudhakar Nori¹; Jagdish Narayan¹; ¹North Carolina State University

K21: Fabrication of Single crystalline NiO based P-N junctions by KrF Laser Treatment: Structure and Photochemical Properties: *Roya Molaei*¹; M.Reza Bayati¹; Jay Narayan¹; ¹North Carolina State University

K22: Interfacial Modeling and Photochemical Properties of Rutile TiO₂/Sapphire Epitaxial Heterostructures: *Mohammad Reza Bayati*¹; Roya Molaei¹; Roger Narayan¹; Jay Narayan¹; ¹North Carolina State University

K23: Inverse Spin Hall Effect Studies on ZnO Thin Films: *Megan Prestgard*¹; Gene Siegel¹; Shiang Teng¹; Ashutosh Tiwari¹; ¹University of Utah

K24: Microstructure and 9MeV Au+ Irradiation Effects of 9Cr-ODS(Oxide Dispersion Strengthened) Steel: *Chenyang Lu*¹; Lumin Wang¹; Zheng Lu²; ¹University of Michigan; ²Northeastern University

K25: Observation of the Spin Seebeck Effect in La_{1-x}Sr_xMnO₃ (LSMO): *Gene Siegel*¹; Megan Prestgard¹; Julia Russ²; Ashutosh Tiwari¹; ¹University of Utah; ²Ithaca College

K26: Resistance Switching Properties and Mechanism of Switching In Epitaxial Pt/ZnO/TiN Thin Film Heterojunctions Grown on Si(001) Substrate: *Sandhyarani Punugupati*¹; Jagdish Narayan¹; Frank Hunte¹; ¹North Carolina State University

K27: Structural, Optical and Transport Properties of Room Temperature Deposited Al and Ga Doped ZnO Films: *Namik Temizer*¹; Sudhakar Nori¹; Jagdish Narayan¹; ¹North Carolina State University

K28: Thin Film Epitaxy and Stress Relaxation Mechanism in Rutile/Sapphire Heterostructures: *Mohammad Reza Bayati*¹; Roya Molaei¹; Roger Narayan¹; Jay Narayan¹; ¹North Carolina State University

K29: Variable Range Hopping Conduction and Magnetic Properties of Single Crystal Semiconducting and Topological Insulator Sr₃SnO: *Yi-Fang Lee*¹; Jagdish Narayan¹; Justin Schwartz²; ¹North Carolina State University

Accelerated Materials Evaluation for Nuclear Application Utilizing Test Reactors, Ion Beam Facilities and Modeling — Poster Session

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

Program Organizers: Peter Hosemann, University of California Berkeley; Julie Tucker, Knolls Atomic Power Laboratory; James Cole, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

L1: An Electron Energy Loss Spectroscopy Study of Helium Bubbles in Nanostructured Ferritic Alloys: *Yuan Wu*¹; Robert Odette¹; Takuya Yamamoto¹; James Ciston²; Peter Hosemann³; ¹UCSB; ²Lawrence Berkeley Laboratory; ³University of California Berkeley

L2: Analysis of Xe Ion Implantation in Mo: *Jeff Rest*¹; Di Yun¹; Bei Ye¹; Zeke Insepov²; ¹Argonne National Laboratory; ²Consultant

L3: Characterization of Developed Microstructure of Nanocrystalline Copper Post Neutron and Ion Irradiation: *Walid Mohamed*¹; Di Yun¹; K. L. Murty²; Abdellatif Yacout¹; ¹Argonne National Laboratory; ²North Carolina State University

L4: Cluster Dynamics Modeling of Defect Cluster Evolution in Ion Irradiated Epitaxial Cr Films on MgO: *Benjamin Ramirez*¹; A. Selby¹; Donghua Xu¹; Brian Wirth¹; T. Kaspar²; C. Wang²; V. Shutthanandan²; R. Kurtz²; ¹University of Tennessee, Knoxville; ²Pacific Northwest National Laboratory

L5: Co-nucleation of Dislocation Loops and He Bubbles in Neutron Irradiated Ferritic Alloys: Dan Edwards¹; *Hee Joon Jung*¹; Rick Kurtz¹; G. Robert Odette²; Takuya Yamamoto²; Bo Yao³; ¹Pacific Northwest National Laboratory; ²University of California, Santa Barbara; ³IM Flash Technology

L6: Comparative Mechanical Properties Analysis of Ion Irradiated Potential Nuclear Fusion Candidate Materials: *Cameron Howard*¹; Bill Choi²; Scott Parker¹; Michael Fluss²; Amanda Lupinacci¹; Akihiko Kimura³; ¹University of California Berkeley; ²LLNL; ³Kyoto University

L7: Comparison of Microstructure of Ion-irradiated and Neutron-irradiated Tubing Made from MA957 ODS Ferritic Alloy: *Mychailo Toloczko*¹; Alicia Certain¹; V. Bryk²; O. Borodin²; A. Kalchenko²; V. Melnichenko²; V. Voyevodin²; I. Neklydov²; Frank Garner³; ¹Battelle/PNNL; ²Kharkov Institute of Physics and Technology; ³Radiation Effects Consulting

L8: Defect Evolution in Iron-based Materials Using Atomistic Simulations: *Haixuan Xu*¹; Roger Stoller²; Yury Osetsyky²; ¹University of Tennessee; ²Oak Ridge National Laboratory

L9: Deformation Behavior of Ion Irradiated Zr-4 Cladding Material: Comparison of Experiments to Modeling: *Blythe Clark*¹; Remi Dingreville¹; Brad Boyce¹; Shreyas Rajasekhara¹; Barney Doyle¹; ¹Sandia National Laboratories

L10: Effect of Heavy Ion Irradiation on Microstructural Evolution in CF8 Cast Austenitic Stainless Steel: *Wei-Ying Chen*¹; Meimei Li²; Marquis Kirk²; Pete Baldo²; Tiangan Lian³; ¹University of Illinois at Champaign-Urbana; ²Argonne National Laboratory; ³Electric Power Research Institute

L11: Effect of Irradiation on the Stability of MX-type Precipitates in Ferritic Steels: *Lizhen Tan*¹; ¹Oak Ridge National Laboratory

L12: Effect of Low Dose Neutron Irradiation on Tensile Behavior of HT-9 Steel at Room Temperature: *Apu Sarkar*¹; A.H. Alsabbagh¹; K.L. Murty¹; ¹North Carolina State University

L13: Effect of Radiation-induced Lattice Defects on Precipitate Formation in Dilute Fe-Cu-Ni Alloy: *Yongfeng Zhang*¹; Wei-Feng Rao¹; Bulent Biner¹; ¹Idaho National Laboratory

L14: Effects of Dose Rate and Primary Defect Structure on Microstructural Evolution in RPV Steels: *Takuya Yamamoto*¹; Hideo Watanabe²; Peter Wells¹; Yuan Wu¹; G. Robert Odette¹; ¹University of California Santa Barbara;

²Kyushu University

L15: Effects of Proton Irradiation and Helium Implantation in Al/B4C MMC for Spent Nuclear Fuel Storage: *Feifei Zhang*¹; Lumin Wang¹; ¹University of Michigan

L16: Exploring Fission Enhanced Diffusion of Uranium in Uranium Dioxide Using Classical Molecular Dynamics Simulations: *Jonathan Wormald*¹; Ayman Hawari¹; ¹North Carolina State University

L17: Helium Implantation Effects on the Tensile Properties and Microstructure of Amorphous Nickel Phosphorous: *Rachel Liontas*¹; X. Wendy Gu¹; Yongqiang Wang²; Engang Fu²; Nan Li²; Nathan Mara²; Julia Greer¹; ¹California Institute of Technology; ²Los Alamos National Laboratory

L18: High Temperature Nanoindentation on Nanostructured Materials: *Zijing Huang*¹; Manuel Abad²; Marisa Figueiredo²; Ning Li¹; Peter Hosemann²; ¹Xiamen University, China; ²University of California Berkeley

L19: IAEA Activities on Modelling and Accelerated Irradiation Testing of Materials for Nuclear Power Applications: *Victor Inozemtsev*¹; Edvard Bradley¹; Andrey Zeman¹; ¹IAEA

L20: Impact of the Injected Interstitial Effect on Ion-induced Void Swelling in Austenitic and Ferritic-martensitic Alloys: *Frank Garner*¹; S. Golubov²; M. Toloczko³; Lin Shao⁴; ¹Radiation Effects Consulting; ²Oak Ridge National Laboratory; ³Pacific Northwest National Laboratory; ⁴Texas A&M University

L21: Influences of the Injected Interstitial and Defect Imbalance on Void Swelling of Pure Iron at 450°C: *Lin Shao*¹; Chao-chen Wei¹; Assel Aitkaliyeva¹; Jonathan Gigax¹; Di Chen¹; F.A. Garner²; ¹Texas A&M University; ²Radiation Effects Consulting

L22: Ion-induced Swelling of Yttrium Oxide Dispersion-strengthened 0Cr18Ni10Ti Steel: V. Bryk¹; *O. Borodin*¹; A. Kalchenko¹; V. Voyevodin¹; V. Ageev²; M. Leontyeva-Smirnova²; Frank Garner³; ¹Kharkov Institute of Physics and Technology; ²High-Technology Research Institute of Inorganic Materials; ³Radiation Effects Consulting

L23: Irradiation Studies on Friction Stir Welded Oxide Dispersion Strengthened Alloys: *Ramprashad Prabhakaran*¹; Yaqiao Wu²; Jatuporn Burns²; James Cole³; Indrajit Charit⁴; Rajiv Mishra⁵; K.L. Murty⁶; ¹Idaho National Laboratory; ²Boise State University; ³Center for Advanced Energy Studies; ⁴University of Idaho; ⁵University of North Texas; ⁶North Carolina State University

L24: Local Chromium Enrichments in High Dose Irradiated Oxide Dispersion Strengthened Steel Alloys: *Nathan Bailey*¹; Alicia Certain²; Erich Stergar¹; Mychailo Toloczko²; Peter Hosemann¹; ¹University of California at Berkeley; ²Pacific Northwest National Laboratory

L25: Microstructural Characterization of Proton and Heavy Ion Irradiated Zr-2.5Nb Pressure Tube Alloy after Deformation: *Fei Long*¹; Mark Daymond¹; ¹Queen's University

L26: Microstructure Analysis of Ion Beam Irradiated CNS-I and CNS-II Steels: *Xu Wang*¹; Qingzhi Yan²; Lumin Wang¹; ¹University of Michigan; ²University of Science and Technology Beijing

L27: Molecular Dynamics Simulations of Displacement Cascades in BCC Metals: *Aaron Selby*¹; Nathan Capps¹; Brian Wirth¹; ¹University of Tennessee

L28: Real Time and In Situ Studies of Materials in a Radiation Environment (MRE): *Simerjeet Gill*¹; Lynne Ecker¹; Avishai Ofan¹; Eric Dooryhee¹; ¹Brookhaven National Laboratory

L29: Removal of Defect Clusters by Twin Boundaries in Nanotwinned Metals: *Kaiyuan Yu*¹; Daniel Bufford¹; Cheng Sun¹; Yue Liu¹; Haiyan Wang¹; Marquis Kirk²; Meimei Li²; Xinghang Zhang¹; ¹Texas A&M University; ²Argonne National Laboratory

L30: Role of Beam Rastering on Microstructural Evolution in Ion Irradiated HT9 Steel: *Elizabeth Beckett*¹; Zhijie Jiao¹; Kai Sun¹; Gary Was¹; ¹University of Michigan



L31: Self-interstitial Diffusion in Concentrated Fe-Cr by Kinetic Monte Carlo and First Principle Molecular Dynamics Simulations: *Katharina Vortler*¹; Ram Krishnamurthy¹; Leland Barnard¹; Izabela Szlufarska¹; Dane Morgan¹; ¹University of Wisconsin, Madison

L32: Simulation of Radiation Damage of Zirconium Alloys with Accelerator of Heavy Ions: Oleg Borodin¹; *Victor Bryk*¹; Ruslan Vasilenko¹; Victor Voyevodin¹; Vladimir Novikov²; Vacheslav Shishov²; ¹Kharkov Institute of Physics and Technology; ²Bochvar High-technology Research Institute of Inorganic Materials

L33: Stability of Interfaces in Thin Film-substrate System under Ion Irradiation: *Alexander Mairov*¹; Benjamin Hauch¹; Kumar Sridharan¹; Todd Allen¹; Jinsuo Zhang²; ¹University of Wisconsin-Madison; ²Ohio State University

L34: Study of Radiation-induced Segregation Using Nickel-chromium Binary Alloys: *Samuel Briggs*¹; Janne Pakarinen¹; Leland Barnard¹; Dane Morgan¹; Izabela Szlufarska¹; Todd Allen²; Kumar Sridharan¹; ¹University of Wisconsin-Madison; ²Idaho National Laboratory

L35: Study of Xe Ion Beam Irradiated Mo Single Crystal by Synchrotron Extended X-ray Absorption Fine Structure: *Di Yun*¹; Jeff Terry²; Walid Mohamed¹; Bei Ye¹; Kevin Logan²; Micheal Pellin¹; Abdellatif Yacout¹; ¹Argonne National Laboratory; ²Illinois Institute of Technology

L36: Surface Stabilities and Helium Trapping of Nano-sized Oxide Phases in Nano-structured Ferritic Alloys: A First Principles Study: *Yong Jiang*¹; Litong Yang¹; Yanan Jin¹; G. Odette²; ¹School of Materials Science and Engineering, Central South University; ²Materials Department, University of California, Santa Barbara

L37: Ultrasonic Signatures of Degradation in Advanced Reactor Materials: *Ryan Meyer*¹; Chuck Henager¹; Shenyang Hu¹; Weilin Jiang¹; Robert Montgomery¹; Pradeep Ramuhalli¹; ¹Pacific Northwest National Laboratory

Advanced Characterization Techniques for Quantifying and Modeling Deformation Mechanisms — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Materials Characterization Committee, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: John Carpenter, Los Alamos National Laboratory; Rodney McCabe, Los Alamos National Laboratory; Thomas Bieler, Michigan State University; Khalid Hattar, Sandia National Laboratories; Marko Knezevic, University of New Hampshire; Irene Beyerlein, Los Alamos National Laboratory

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

C1: A Dynamic Hardening Rule for Crystal Plasticity with a Generalization to the Classical Hardening Rule: *Aboozar Mapar*¹; Thomas Bieler¹; Farhang Pourboghrat¹; Christopher Compton²; ¹Michigan State University; ²National Superconducting Cyclotron Laboratory

C2: Identification of Slip Parameters in Commercially Pure Tantalum Using Micro and Nanoindentation: *Bret Dunlap*¹; Claudio Zambaldi²; Philip Eisenlohr¹; Thomas Bieler¹; Martin Crimp¹; ¹Michigan State University; ²Max-Planck-Institut für Eisenforschung GmbH

C3: In Situ Dynamic Indentation for Materials Characterization under Time and Temperature: *Douglas Stauffer*¹; Ryan Major¹; S.A. Syed Asif¹; ¹Hysitron, Inc.

C4: Observation and Modeling of Deformation Mechanisms in Magnetoelastic Materials: *Ben Wang*¹; Yongmei Jin¹; ¹Michigan Technological University

C5: Probing High Temperature Nanomechanics in Indium Nanostructures Using Synchrotron Laue X-Ray Microdiffraction: *Arief Budiman*¹; M Burek²; G Lee²; D Jang³; Martin Kunz⁴; Nobumichi Tamura⁴; Ting Tsui²; ¹Singapore University of Technology & Design (SUTD); ²University of

Waterloo; ³California Institute of Technology; ⁴Advanced Light Source (ALS)

C6: Cryogenic Micromechanical Testing of Tin: *Amanda Lupinacci*¹; Josh Kacher²; Alanna Eilenberg¹; Andrew Shapiro³; Peter Hosemann¹; Andrew Minor¹; ¹University of California Berkeley; ²Lawrence Berkeley National Laboratory; ³JPL

C7: Quantitative Measurement of Plastic Zone Size in Al 7075 Using a Combination of X-ray Synchrotron Laue Microdiffraction and Microtomography: *Peter Hruby*¹; Sudhanshu Shekhar Singh¹; Jason Williams¹; Huxiao Xie¹; Ruqing Xu²; Xianghui Xiao²; Francesco De Carlo²; Nikhilesh Chawla¹; ¹Arizona State University; ²Argonne National Laboratory

C8: Understanding and Improving Orientation Precision of EBSD Measurements of Deformed Materials: *Matt Nowell*¹; Stuart Wright¹; ¹EDAX

C9: Application of Acoustic Emission Technique for Online Monitoring of Friction Stir Welding Process: *B M Rajaprakash*¹; Suresha C N²; Sarala Upadhyaya¹; ¹University Visvesvaraya college of Engineering; ²Jyothy Institute of Technology

C10: Characterization and Constitutive Material Model Implementation for High-strain-rate Deformation Modeling with Finite Elements: *Jeremy Schreiber*¹; Ivi Smid¹; Tim Eden¹; ¹Penn State

C11: In Situ Testing for Monitoring Damage Development in a Single Ply Composite Material: *Kathryn Dannemann*¹; Forrest Campbell²; Alexander Carpenter²; Trenton Kirchdoerfer³; Sidney Chocron³; James Walker³; U. Heisserer⁴; H. van der Werff⁵; ¹Southwest Research Institute; ²Southwest Research Institute; ³Southwest Research Institute; ⁴DSM Ahead/MS; ⁵DSM Dyneema

C12: In Situ Hot-Stage TEM Analysis of High Pressure Cold Sprayed 6061 Aluminum Alloy Powder: *Mohammad Reza Rokni*¹; Christian Widener¹; ¹SDSM&T

C13: Nanoscratch-induced Microplasticity and Microcracking in Magnesia-ytria (50:50 vol. %) Ceramic Nanocomposite Fabricated by Spark Plasma Sintering: Lin Huang¹; Wenlong Yao¹; Kristopher Wehage¹; Klaus van Benthem¹; Jing Liu¹; Amiya Mukherjee¹; *Julie Schoenung*¹; ¹University of California, Davis

Advanced Materials in Dental and Orthopedic Applications — Poster Session

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Tolou Shokuhfar, Michigan Technological University; Terry Lowe, Colorado School of Mines; Hanson Fong, University of Washington; Mathew Mathew, Rush University Medical Center; Cortino Sukotjo, University of Illinois at Chicago

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

E1: Antibacterial Properties of Silver Nanoparticles Incorporating into Coating Layer on Ti-6Al-4V Alloy Prepared by Micro Arc Oxidation: *Yeon Sung Kim*¹; Sang Il Yoon¹; Eung Seok Lee¹; Young Gun Ko²; Dong Hyuk Shin¹; ¹Hanyang University; ²Yeungnam University

E2: Characterization of Cellular Metals of the Ti-6Al-4V Alloys for Biomedical Applications Processed by Rapid Prototyping: *Samira Lea Ruiz*¹; Luis Fernando Bernardes²; André Luiz Jardim Munhoz²; Carlos Roberto Grandini¹; ¹Universidade Estadual Paulista; ²UNICAMP

E3: Comparative Study on Tribological Behavior of Ti-6Al-7Nb and SS AISI 316L Alloys, for Total Hip Prosthesis: *Fellah Mamoun*¹; Labaiz Mohamed¹; Assala Omar¹; Dekhil Leila¹; ¹Surface Engineering and Tribology Group, Laboratory of Metallurgy and Engineering Materials

E4: Effect of the Substitutional Element in Selected Mechanical Properties of the Ti-15Mo-xZr System: Fábio Vicente¹; *Carlos Grandini*²; ¹UNESP - Univ. Estadual Paulista

E5: Effect of the Substitutional Element in Selected Mechanical Properties

of the Ti-15Zr-XMo System: *Diego Correa*¹; Mariana Lourenço¹; Pedro Kuroda¹; Carlos Roberto Grandini¹; ¹UNESP – Univ Estadual Paulista, Laboratório de Anelasticidade e Biomateriais

E6: Influence of the Substitutional Element in Selected Mechanical Properties of the Ti-15Mo-XNb System: *José Roberto Martins Jr*¹; Carlos Grandini¹; ¹UNESP

E7: Synthesis, Nanostructure and Hydrophilicity of Nanotube Formed Ti for Biocompatibility: *Maria Cristina Rosifini Alves Rezende*¹; Jorge Luiz Rosa²; Alain Robin²; Sandra Giacomini Scheneider²; João Augusto Guedes de Oliveira¹; Maria Emilia Pereira Bensi¹; Ana Paula Rosifini Alves Claro¹; ¹Unesp; ²USP

Algorithm Development in Computational Materials Science and Engineering — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee
Program Organizers: Jonathan Zimmerman, Sandia National Laboratories; Douglas Spearot, University of Arkansas; Adrian Sabau, Oak Ridge National Laboratory; Mark Tschopp, Army Research Laboratory; Mohsen Asle Zaeem, Missouri University of Science and Technology

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

F1: Discrete Element Simulation for Magnetic-aligned Compaction of Magnetic Powders: *Rikio Soda*¹; Kenta Takagi²; Kimihiro Ozaki²; ¹MagHEM; ²AIST

F2: Crystal Plasticity Fem Study of the Effects of BW Hardening Model Parameters on Nano-indentation Deformation Behaviour of Copper Single: *Mao Liu*¹; Lu Cheng¹; Anh Tieu¹; ¹University of Wollongong

F3: The J-Integral of a Mixed Mode Crack in Finite Domains with Volterra Dislocations: *Andrew Sheng*¹; Tamer Crosby¹; Nasr Ghoniem¹; ¹UCLA

F4: Simulation of Temperature Field and Microstructure in Heavy Steel Ingots Solidification: *Jing Zhao*¹; Honggang Zhong¹; Zhichen Zhang¹; Jieyu Zhang¹; Qijie Zhai¹; ¹Shanghai University

F5: Reduction Effect on Thermal Conductivity of Silicon by Defect Structures Investigated from Atomistic Level: *Tao Wang*¹; Georg Madsen¹; Alexander Hartmaier¹; ¹Ruhr-Universität Bochum

F6: A FEM-based Inverse Calculation Method for Determination of Heat Transfer Coefficient in Liquid Quenching Process: *Peng Du*¹; Gang Wang¹; Zhenguo Nie¹; Yiming Rong¹; ¹Tsinghua University

F7: Intersecting Slip for Dislocation Dynamics in 2-Dimensions: *William Kuykendall*¹; Wei Cai¹; ¹Stanford University

F8: Fast Methods for Long-range Interactions and Improved Load-balancing for Particle Simulations on Massively Parallel Computers: *Godehard Sutmann*¹; Christoph Begau²; ¹Forschungszentrum Juelich; ²Ruhr-Universität Bochum

F9: A GPU Cluster Optimized Multigrid Scheme for Computing Unsteady Incompressible Fluid Flow: *Gyula Toth*¹; Gyorgy Tegze¹; ¹Wigner Research Centre for Physics

F10: Numerical Determination of Secondary Dendrite Arm Spacing of Fe-C Alloy as a Function of Cooling Rate and Local Solidification Time: *Alexandre Ferreira*¹; Ingrid Salvino¹; Ever Melo¹; ¹Universidade Federal Fluminense

F11: Optimization of Hierarchical Lattice Structures for Energy Absorption: *Steven Wehmeyer*¹; Matthew Begley¹; Frank Zok¹; ¹University of California at Santa Barbara

F12: Multi-scale Method Development: Enabling the Investigation of the Role of Oxygen in Electrical Contact Degradation: *Xiaoyin Ji*¹; Benjamin Gaddy¹; Angus Kingon²; Douglas Irving¹; ¹North Carolina State University;

²Brown University

F13: Automatic Registration Method to Combine Image Sets from Optical Microscopy and SEM: *Otávio Gomes*¹; ¹CETEM

F14: Bayesian Networks in Materials Science: New Tools to Predict the Properties of Materials: *Franck Tancret*¹; Philippe Leray¹; Edern Menou¹; ¹Université de Nantes

F15: Coarse Grain Model for Coupled Thermo-mechano-chemical Processes and Its Application to Pressure-induced Endothermic Chemical Reactions: *Edwin Antillon*¹; Kiattipong Banlusan¹; Alejandro Strachan¹; ¹Purdue University

F16: Numerical Simulation and Experiment Validation of Multi-pouring Process of a Heavy Steel Ingot: *ZhenHu Duan*¹; HouFa Shen¹; BaiChen Liu¹; ¹Tsinghua University, Beijing

F17: Development of an Asymptotics-based Numerical Model for the Formation and Evolution of Air Gaps in the Vertical Continuous Casting of Alloys: *Saud Saleem*¹; Michael Vynnycky²; Hasse Fredriksson¹; ¹The Royal Institute of Technology; ²Mathematics Applications Consortium for Science and Industry (MACSI), Department of Mathematics and Statistics, University of Limerick

F18: Comparing Fixed and Moving Mesh Methods for Phase-field Models: *Benjamin Winchester*¹; ¹Sandia National Laboratories

F19: Fracture Criterion for Brittle Polycrystalline Materials Based on a Discrete Element Method: *Tonya Stone*¹; Katerine SalemeRuiz¹; Bryce Devine²; Laura Walizer²; Wayne Hodo²; ¹Mississippi State University; ²US Army Engineer Research & Development Center

F20: Effect of Oxygen on Dislocation Core Properties in a-Titanium: A QM/MM Study: *Mehul Bhatia*¹; Gang Lu²; Kiran Solanki¹; Xu Zhang²; ¹Arizona State University; ²California State University Northridge

Aluminum Alloys: Development, Characterization and Applications — Poster Session

Sponsored by: TMS Light Metals Division, TMS: Aluminum Committee
Program Organizers: Zhengdong (Steven) Long, Kaiser Aluminum; Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Xiyu Wen, University of Kentucky

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Room: Sails Pavilion
Location: San Diego Convention Center

I1: Interface Evolution in the Process of Fabricating Aluminum Foam Sandwiches: Hao Lin¹; Hongjie Luo¹; Wei Sun¹; Guangchun Yao²; ¹Northeastern University, School of Materials and Metallurgy; ²Shenyang Neu Advanced Materials Company

I2: Simulation of Cold Rolling of Aluminum Single Crystal Oriented with (123)[634]: *Guanyu Deng*¹; Cheng Lu¹; Lihong Su¹; Anh Kiet Tieu¹; Xianghua Liu²; ¹University of Wollongong; ²Northeastern University Research Academy, Northeastern University

I3: Structure and Microstructure of Continuously Casted Aluminum Clad Ingot in As-cas and Rolled State: *Jong Ho Kim*¹; ¹Research Institute of Industrial Science and Technology

I4: Physicochemical Properties of Al-Mg and Al-Mg-Zn Alloys: *Tomasz Gancarz*¹; Wladyslaw Gasior¹; Janusz Pstrus¹; Julien Jourdan²; Hani Henein²; ¹Institute of Metallurgy and Material Science PAS; ²Chemical and Materials Engineering (CME), University of Alberta

I5: Effect of Tin on the Corrosion and Electrochemical Behavior of Al-Zn-Mg Alloy in Sea Water: *M. Sadawy*¹; K. Zohdy¹; ¹Faculty of Engineering, Al-Azhar University, Cairo, Egypt



I6: Alloy AlZn9 Casted in the Process of Rapid Solidification and Consolidated in the Process of Plastic Forming: Wojciech Szymanski¹; Marcin Szymonek²; *Sonia Boczkal*²; Maciej Gawlik²; Mariusz Bigaj²; ¹Institute of Non-Ferrous Metals ; ²Institute of Non-Ferrous Metals

I7: Nanocrystalline Aluminum Alloys Thermally Stabilized with Diamantane Hydrocarbons: *Simon Pun*¹; Walid Hanna¹; Farghalli Mohamed¹; ¹University of California, Irvine

I8: Friction Coefficients on Compression Testing of AA6060 and 42CrMo4 with Different Lubrication Conditions: *Sabbah Ataya*¹; Tobias Emde²; ¹Suez University; ²Mannesmann Grobblech GmbH

Biological Materials Science Symposium — Poster Session

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Po-Yu Chen, National Tsing Hua University; Rajendra Kasinath, Johnson and Johnson Company; Dwayne Arola, University of Washington; Kalpana Katti, North Dakota State University

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February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

Session Chair: Po-Yu Chen, National Tsing Hua University

E8: Applications of Focused Ion Beam – Electron Scanning Microscopy on the Characterization of Polymer Coating: *Jacie Chen*¹; Don Wei¹; ¹DawnLabs

E9: Cytotoxicity of Silver Nanoparticles on Cytoskeleton and Mechanical Behavior of Red Blood Cells: *Shou-Yi Chang*¹; Yu-Ying Shie¹; Yen-Chung Chen¹; Ying-Ting Wang¹; ¹National Chung Hsing University

E10: Ecological-economical Wheelchair: *Miguel Rivera*¹; Wenqian Zhao¹; Waseem Haider¹; ¹The University of Texas-Pan American

E11: Microbial Synthesis and Fabrication of Palladium Nanoparticle Catalysts by Using the Metal Ion-reducing Bacterium *Shewanella* Algae: *Rie Tanaka*¹; Koshiro Tamaoki¹; Norizo Saitoh¹; Toshiyuki Nomura¹; Yasuhiro Konishi¹; ¹Osaka Prefecture University

E12: Structural Characterization on the Foot of Red Abalone and its Contribution to the Structure of Nacre: *Maria Lopez*¹; Marc Meyers¹; ¹UCSD

E13: An Experimentally-based Flow Stress Model for Cortical Bone: Ilige Hage¹; *Ali Ammouri*¹; Ramsey Hamade¹; ¹American University of Beirut

E14: Applications of Polymer Nanofibers in Bio-materials, Biotechnology and Biomedicine: *Miguel Rivera*¹; ¹The University of Texas-Pan American

E15: Effect of P₂O₅ on Sintering Behavior of Na₂O-CaO-Al₂O₃-SiO₂ Glass Ceramic System: Behzad Mehdikhani¹; *Marjan Heidarzadeh*¹; ¹Standard Research Institute

E16: Investigations on the Corrosion Behaviour of Magnesium Alloys: ZfW PM F, ZfW D, AM20 PM, LAM220 PM, and LAE442-0,5% Ca PM in Aqueous Solutions: Ringer,Ringer Lactate Borax [3% NaCl pH 9,3; Borax buffer] at 30/37°C: *Volkmar Neubert*¹; ¹MSE Werkstoffzentrum Clausthal

E17: Measurement of Surface Free Energy of TiO₂ for Haemocompatibility Analysis: Jonathan Schuster¹; Rosenberger Mario¹; *Schvezov Carlos*¹; ¹IMAM (UNAM-Conicet)

E18: Preliminary Investigations into the Processing and Properties Powder-based Novel Neural Electrodes: *T Singh*¹; J Lopez¹; C Martinez¹; K. Morsi¹; ¹San Diego State University

E19: The Preparation of Silver Nano-particles with Biosorption by *Bacillus Megaterium*: *Hongxu Li*¹; Chao Li¹; Yunchi Guo¹; Xie Yang¹; ¹University of Science and Technology

E20: Utilization of Eupatorium Adenophorum Spreng for Preparation of Activated Carbon Using Phosphoric Acid Activation by Ultrasound and Microwave Radiation: *Hongying Xia*¹; ¹Kunming University of Science and

Technology

E21: Stability and Metal Ion Release of Titanium and Stainless Steel Mini-implants with Surface Treatment for Dental Purposes: *Daniel Fernandes*¹; Carlos Elias²; Angela Dalvi²; Ruy Marques³; ¹University of California, San Diego; ²Military Institute of Engineering; ³Rio de Janeiro State University

Bulk Metallic Glasses XI — Poster Session

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

Program Organizers: Peter Liaw, University of Tennessee; Gongyao Wang, University of Tennessee; H. Choo, University of Tennessee; Y. Gao, University of Tennessee; Y. F. Shi, Rensselaer Polytechnic Institute

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Room: Sails Pavilion
Location: San Diego Convention Center

B1: Investigation of the Effects of Secondary Phases on Deformation Behaviour of the Bulk Metallic Glass Composites: *Hyunseok Oh*¹; Jinkyu Lee²; Yeonwook Kim³; Wancheok Woo⁴; Eunsoo Park¹; ¹Seoul National University; ²Kongju National University; ³Keimyung University; ⁴Neutron Science Division, Korea Atomic Energy Research Institute

B2: Property Evaluation of Thermal and Oxidation Behavior in Al-rich Al-TM-MM Metallic Glasses: *Jinyeon Kim*¹; Mehdi Mansouri²; Jein Lee¹; Eunsoo Park¹; ¹Research Institute of Advanced Materials, Department of Materials Science and Engineering, Seoul National University; ²Department of Materials Science and Engineering, Sharif University of Technology

B3: Fabrication and Wear Properties of CNT / Ti₅₀Cu₂₈Ni₅Sn₇ Bulk Metallic Glass Composites by Powder Metallurgy Route: *Pee-Yew Lee*¹; Chih-Feng Hsu¹; ¹National Taiwan Ocean University

B4: MgZnCa Bulk Metallic Glass Composites with High Ductility as Potential Temporary Implant Metals: *Junheng Gao*¹; W. Mark Rainforth¹; Iain Todd¹; ¹University of Sheffield

Celebrating the Megascale: An EPD Symposium in Honor of David G.C. Robertson — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Phillip Mackey, P.J. Mackey Technology; Rodney Jones, Mintek; Eric Grimsey, Curtin University, W A School of Mines; Geoffrey Brooks, Swinburne University of Technology

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Room: Sails Pavilion
Location: San Diego Convention Center

H1: Nitrogen Solubility in Mn-Fe-Si-C Alloy Melts: *June-Yong Eom*¹; Jung-Mock Jang¹; Min-Kyu Paek¹; Jong-Jin Pak¹; ¹Hanyang University

H2: Study on Dezincification and De-lead of Blast Furnace Dust by Fluidized Reduction Experiment: *Shufeng Yang*¹; Chuanan Hou¹; Jingshe Li¹; Xiangzhou Gao¹; ¹University of Science and Technology Beijing

Characterization of Minerals, Metals and Materials 2014 — Poster Session

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

Program Organizers: John Carpenter, Los Alamos National Laboratory; Chen-Guang Bai, Chongqing University; Jiann-Yang Hwang, Michigan Technological University; Shadia Ikhmayies, Al Isra University; Bowen Li, Michigan Technological University; Sergio Monteiro, State University of North Rio de Janeiro; Zhiwei Peng, Michigan Technological University; Mingming Zhang, ArcelorMittal Global R&D

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Room: Sails Pavilion
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C14: A Comparison between the Mechanical and Thermal Properties of Copolyester/Poly(lactic Acid) Blend Reinforced with Green Silica: *Jaciele Teixeira*¹; Valquiria Silva¹; Maria Colombo²; Rene Oliveira¹; Julio Harada¹; Angel Ortiz¹; Esperidiana Moura¹; ¹Instituto de Pesquisas Energeticas e Nucleares-IPEN-CNEN/SP; ²Faculdade de Tecnologia da Zona Leste

C15: Brazilian Bentonite Submitted to Mild Acid Treatment: *Francisco Valenzuela-Diaz*¹; Christiano Andrade¹; Maria das Gracas Valenzuela¹; Valquiria Justo¹; Francisco Mondelo-Garcia¹; Cristina Volzone²; ¹Universidade de Sao Paulo; ²CETMIC Centro de Tecnología de Recursos Minerales y Cerámica

C16: Characterization of Nickel Laterite Ore: *Tao Li*¹; ¹Shanghai University

C17: Development of Low-density Polyethylene (LDPE) Composites Reinforced with Coconut Fibers (CF) Modified and without Modifying: *Matheus Bedin*¹; Rubén Rodríguez¹; Leticia Monteiro¹; ¹Universidade Estadual Do Norte Fluminense Darcy Ribeiro (UENF)

C18: Effect of YSZ Addition on the Electrical Properties of NTC Thermistors Based of (YSr)(MnAlCr)O₃ Perovskites: *WoonYoung Lee*¹; *JinSung Park*¹; ¹Chosun university

C19: Formulation and Characterization of Biocomposites with Nanodiamond for Orthopedic Applications: *Lucivan Junior*¹; Priscila Pereira¹; Rubén Sánchez¹; Yam Maia¹; ¹State University of North Rio de Janeiro

C20: In Situ High Temperature X-ray Analysis of a Supermartensitic Stainless Steel: *Tatiane Santos*¹; *Adriana Rocha*²; Ricardo de Carvalho¹; Vicente Buono³; ¹Vallourec Tubos do Brasil S.A.; ²LNDC - UFRJ; ³UFMG

C21: Influence of Precipitates on SSC Resistance of High Strength Steel: *Rafael Braga*¹; Vicente Buono²; Cesar Olea¹; ¹Vallourec Tubos do Brasil SA; ²UFMG

C22: Iron Recovery from Copper Slag through Oxidation-magnetic Concentration at Intermediate Temperature: *Zhiwen Wu*¹; ¹Shanghai University

C23: Modification of DGEBA Thermoset Resin and Evaluation of Mechanical Properties and Abrasive: *Camila Amaral*¹; Sánchez Rodríguez²; Eduardo Atem²; Magno Bessa²; ¹Universidade Estadual do Norte Fluminense; ²Universidade Estadual do Norte Fluminense Darcy Ribeiro

C24: Obtaining Nanocapsules from Phbeg/Mmt Composite: *Maria das Graças Valenzuela*¹; Camila Matos²; Isaac Sayeg²; Adriana Moreira²; Helio Wiebeck²; Francisco Valenzuela-Díaz²; Wang Shu Hui²; ¹Centro Universitário Estacio Radial de São Paulo; ²University of Sao Paulo

C25: Characterization of High Phosphorous Libyan Iron Ores: *Ali Tajouri*¹; ¹University of Tripoli

C26: Preparation and Characterization of Polypropylene Nanocomposites with Organoclay and Discarded Bond Paper: *Francisco Valenzuela-Diaz*¹; *Danilo Fermino*¹; Maria das Gracas Valenzuela¹; Esperidiana Moura²; Duclerc Parra²; ¹Universidade de Sao Paulo; ²Nuclear and Energy Research Institute, IPEN-CNEN/SP

C27: Research on Preparation and Properties of Inorganic Gelling Materials for Sand Fixation: *Mingsheng He*¹; Jianbao Li²; Gaifeng Xue¹;

Feng Hao²; ¹WISCO; ²Tsinghua University

C28: Structure and Elastic Properties of Ni₃Al Based Super Alloys under High Pressure: *Selva Raju*¹; Ross Hrubciak¹; Vadym Drozd¹; Krishna Rajan²; Srikanth Srinivasan²; ¹Florida International University; ²Iowa State University

C29: The Leaching of the Toxicity of Stainless Steelmaking Dust and Analysis: *Qing Xiao*¹; Qiuju Li; ¹Shanghai University

C30: Thermal Decomposition Reaction Mechanisms and Kinetics of Ammonium Paratungstate Tetrahydrate (APT): *Anil ESER*¹; Cem Kahraman¹; *Ibrahim Yusufoglu*¹; ¹Istanbul University

C31: Toward Achieving Long Term Performance Stability of Li Ion Batteries: Can Evaluation of Trace and Ultra-trace Level Contaminants Help?: *Xinwei Wang*¹; Karol Putyera¹; Sanjay Patel¹; ¹Evans Analytical Group, LLC.

C32: Addition of Nanoclay with Silver Nanoparticles in the Copolyester Biodegradable: *Alexandre Silva*¹; Mahesh Hosur²; Hynd Remita³; Jaciele Teixeira⁴; Edinaldo Severino⁴; Esperidiana Moura⁴; Francisco Valenzuela-Diaz⁵; ¹IPEN; ²Tuskegee University; ³CNRS-Université Paris-Sud; ⁴IPEN; ⁵Escola Politécnica da Universidade de São Paulo

C33: Characterization of Different Clays for the Manufacture of Artifacts Ceramic Red: *Afonso Azevedo*¹; Jonas Alexandre¹; Euzebio Zanelato¹; Gustavo Xavier¹; Carlos Mauricio Vieira¹; Sergio Monteiro²; *Thales Otal*¹; ¹UENF; ²IME

C34: Characterization of Sisal Fibers Thermal Properties by Photoacoustic Technique: *Artur Campos Pereira*¹; Sergio Monteiro¹; *Frederico Margem*¹; Roberto Faria Jr.¹; ¹Universidade Estadual do Norte Fluminense

C35: Izod Impact Tests of Polyester Composites Reinforced with Bamboo Fibers of the Specimen *Dendrocalmus Giganteus*: *Lucas Martins*¹; Frederico Margem¹; Sérgio Monteiro²; Rômulo Loyola¹; Igor Margem¹; ¹UENF; ²IME

C36: Friction Stir Welding of Polycarbonate Sheets: *Mostafa Shazly*¹; *Mohamed Ahmed*²; Mohamed El-Raey¹; ¹The British University in Egypt; ²Suez University

C37: The Grain Growth Kinetics of 0.5 mol% B₂O₃-1 mol% TiO₂-doped ZnO Ceramics: *Gökhan Hardal*¹; Berat Yüksel¹; ¹Istanbul University

C38: Izod Impact Resistance of Jute Fiber Reinforced Polyester Matrix: *Isabela Silva*¹; Alice Bevitori¹; Caroline Oliveira¹; Frederico Margem¹; Sergio Monteiro¹; ¹UENF

C39: Photoacoustic Characterization of Polyester Matrix Reinforced with Curaua Fibers: *Noan Simonassi*¹; *Frederico Margem*¹; Rômulo Loiola¹; Sergio Monteiro¹; Roberto Faria¹; Thallis Cordeiro¹; ¹State University of the Northern Rio de Janeiro

C40: Photoacoustic Thermal Characterization of Buriti Fibers: *Giulio Altoé*¹; Frederico Margem¹; Sérgio Monteiro²; Roberto Faria Jr.¹; Thallis Cordeiro¹; ¹State University of the Northern Rio de Janeiro - UENF; ²Military Institute of Engineering, IME

C41: Synthesis and Characterization of Ammonium Jarosite with Arsenic: *Francisco Patiño*¹; Mizraim Flores²; Iván Reyes³; J. Eliecer Méndez¹; Martín Reyes¹; Ister Mireles¹; Juan Hernández¹; ¹Universidad Autónoma del Estado de Hidalgo; ²Universidad Tecnológica de Tulancingo; ³Universidad Tecnológica de Tula-Tepeji

C42: Failure Mode Characterization of Polymer Matrix Composites during Tensile Testing: *Jeongguk Kim*¹; ¹Korea Railroad Research Institute

C43: Bioleaching and Electrobioleaching of Low Grade Copper Sulfide Ore(Chalcopyrite) of Sarcheshmeh Copper Mine: *Hossein Ehtiman*¹; ¹GolGohar Mining & Industrial Company



Computational Modeling and Simulation of Advanced Materials for Energy Applications — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee

Program Organizers: Lan Li, Boise State University; Laura Bartolo, Kent State University; Cong Wang, Northwestern University; Chandler Becker, NIST

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

Session Chair: Lan Li, Boise State University

J1: Elastic and Thermodynamics Properties of the B2- ErX (X=Cu, Au, Ag, Ir) Type Rare Earth Intermetallic Compounds from Ab-initio Calculations: SEKKAL Abdessamad¹; BENZAIER Abdelnour²; ¹Université Abou Bekr Belkaid Tlemcen, Algérie; ²Université Abou Bekr Belkaid Tlemcen, Algérie

J2: Development and Practice of Blast Furnace Physical Heat Index Based on the Hot Metal Silicon Content and Temperature Prediction Model: Bing Dai¹; Jian-liang Zhang¹; Cui Wang¹; Zhe Jiang¹; ¹University of Science and Technology Beijing

Computational Thermodynamics and Kinetics — Poster Session

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Alloy Phases Committee, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Long Qing Chen, Penn State University; Guang Sheng, Scientific Forming Technologies Corporation; Jeffrey Hoyt, McMaster University; Dallas Trinkle, University of Illinois at Urbana-Champaign

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February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

Session Chair: Jeff Hoyt, McMaster University

F21: Thermodynamic and Crystallography Analysis on Complex Inclusions in Ti Deoxidized Low Carbon Steel: Feifei Sun¹; Huigai Li¹; Jieyun Chen¹; Shaobo Zheng¹; Qijie Zhai¹; ¹Shanghai University

F22: Crystal-melt interfacial Properties of HCP Metals by Molecular Dynamics Simulations: Ebrahim Asadi¹; Mohsen Asle Zaeem¹; ¹Missouri University of Science and Technology

F23: Diffusion Mechanism Map of Solute Atom Diffusion in Alloys: Akio Ishii¹; Shigenobu Ogata¹; ¹Osaka University

F24: Electronic Structure Calculations of Screw Dislocation Core Structure as a Function of Dilatation and Its Relation to Ductility in Tungsten: Lucile Dezerald¹; Jaime Marian²; Francois Willaime¹; Lisa Ventelon¹; David Rodney³; ¹CEA; ²Lawrence Livermore National Laboratory; ³Grenoble INP

F25: Influence Factors for Brittle-to-ductile Transition in Twinned Copper: Linqing Pei¹; Cheng Lu¹; Kiet Tieu¹; Xing Zhao¹; Kuiyu Cheng¹; Liang Zhang¹; ¹University of Wollongong

F26: Kinetic Monte Carlo Study of Fission Gas and Grain Growth in Nuclear Fuels: Richard Hoffman III¹; Chaitanya Deo¹; ¹Georgia Institute of Technology

F27: Micromagnetic Simulations of Spin Transfer Torque Magnetization Switching in Heusler Alloy Co₂FeAl-Based Magnetic Tunnel Junction Spin-valve Nanopillar: Houbing Huang¹; Xingqiao Ma²; Long-Qing Chen¹; ¹Penn State University; ²USTB

F28: Modeling of (De-)agglomeration of Inert Solid Particles of Arbitrary Shape in Sheared Flow: Gyula Toth¹; Gyorgy Tegze¹; Laszlo Granasy¹; ¹Wigner Research Centre for Physics

F29: Molecular Dynamics Modelling of Diffusional Formation of Titanium

Carbide Clusters in Iron Matrix: Yanan Lv¹; Peter Hodgson¹; Lingxue Kong¹; Weimin Gao¹; ¹Deakin University

F30: Numerical Simulation of Thermomechanical Processes Coupled with Microstructure Evolution: Alberto Brito¹; Tiago Colombo¹; Lirio Schaeffer¹; ¹Universidade Federal of Rio Grande do Sul

F31: Stress Induced Martensitic Transformation in Zirconia and Its Transformation Toughening Effect: Mahmood Mamivand¹; Mohsen Asle Zaeem²; Haitham El Kadiri¹; ¹Mississippi State University; ²Missouri University of Science and Technology

F32: Thermodynamics Study of Solubility of MgO, CaO, SiO₂, FeO, Fe₂O₃ under Different pH Value with OLE Software: Shaohua Ju¹; Zhanyong Guo¹; Libo Zhang¹; Jinhui Peng¹; Mengyang Huang¹; ¹Yunnan Provincial Key Laboratory of Intensification Metallurgy

F33: Time Scaling Monte Carlo Potts Using Non-ideal Microstructural Features: Alan Williamson¹; Jean-Pierre Delplanque¹; ¹University of California, Davis

F34: A Phase Field Modeling of Electrostatics: Dong-Uk Kim¹; Pil-Ryung Cha¹; ¹Kookmin University

F35: Computational Study of Microstructure and Property Relations in Ferroelectric Polycrystals: Jie Zhou¹; Yu Wang¹; ¹Michigan Technological University

F36: Computational Study of the Stiffness of Asymmetric Tilt Boundaries in a Model BCC Binary Alloy: Isaac Toda-Caraballo¹; Paul Bristowe¹; ¹University of Cambridge

F37: Crystal Plasticity Based Numerical Modeling of Dynamic Recrystallization in Magnesium Alloys: Evdokia Popova¹; Yauheni Staraselski¹; Abhijit Brahma¹; Raja K. Mishra²; Kaan Inal¹; ¹University of Waterloo; ²General Motors Research and Development Center

F38: Determination of Solid-liquid Interface Free Energy from Molecular Dynamics Simulation: S. R. Wilson¹; M.I. Mendeleev¹; ¹Ames Laboratory, USDOE

F39: First-principles Simulations of the Interaction of Alloying Elements with the Austenite-ferrite (fcc-bcc) Interface in Iron: Hao Jin¹; Ilya Elfmov¹; Matthias Militzer¹; ¹The University of British Columbia

F40: First-principles Study of Ni and Cu Additions on Stacking Fault Energy for Third Generation Advanced High Strength Steels: Krista Limmer¹; Julia Medvedeva¹; ¹Missouri S&T

F41: Modeling and Simulation of Isothermal Reduction of a Single Hematite Pellet in Gas Mixtures of H₂ and CO: Reza Beheshti¹; John Moosberg-Bustnes¹; Ragnhild E. Aune²; ¹Northern Research Institute (Norut Narvik); ²Royal Institute of Technology (KTH)

F42: Molecular Dynamics Study of Nucleation under High Driving Force Regime: Ramanarayan Hariharaputran¹; David Wu¹; ¹Institute of High Performance Computing, Agency for Science, Technology and Research

F43: Shear Response of an Al S5 Asymmetrical Tilt Grain Boundary Simulated by Molecular Dynamics: Kuiyu Cheng¹; Cheng Lu¹; Kiet Tieu¹; Linqing Pei¹; ¹University of Wollongong

F44: Simulating the Alignment of Nuclei during Solidification of a Nickel Base Alloy due to External Magnetic Field: Bala Radhakrishnan¹; Nagraj Kulkarni¹; ¹Oak Ridge National Laboratory

F45: Stable Structures and Thermodynamic Properties of Os-W Alloys: Qunfei Zhou¹; T. John Balk¹; Matthew J. Beck¹; ¹University of Kentucky

F46: Thermodynamic Properties of Paramagnetic Iron from First-principles: Fritz Körmann¹; Blazej Grabowski¹; Biswanath Dutta¹; Tilmann Hickel¹; Jörg Neugebauer¹; ¹Max-Planck-Institut für Eisenforschung

Deformation, Damage, and Fracture of Light Metals and Alloys III — Poster Session

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

Program Organizers: Ke An, Oak Ridge National Laboratory; Qizhen Li, University of Nevada, Reno

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

I9: Mechanical Behavior of Eutectic Cu-Zn-Al Shape Memory Alloy: *Haohan Li*¹; Qizhen Li¹; ¹University of Nevada, Reno

I10: Mechanical Behavior of Magnesium Subjected to Severe Plastic Deformation: *Xing Jiao*¹; Qizhen Li¹; ¹University of Nevada, Reno

I11: Tensile Properties of Twin-roll and Direct Chill Cast AZ31 Magnesium Alloy: *Mariia Zimina*¹; Premysl Málek¹; Jan Bohlen²; Dietmar Letzig²; Gerrit Kurz²; Miroslav Cieslar¹; ¹Charles University in Prague; ²Magnesium Innovation Centre (MagIC) Helmholtz-Zentrum Geesthacht

I12: Effects of Electromagnetic Field and Re-melting on Degassing of Molten Aluminum Alloys: Yongsheng Ren¹; Wenzhou Yu¹; Kuixian Wei¹; *Wenhui Ma*¹; ¹Kunming University of Science and Technology

I13: The Effect of a Pulsed Electric Current on the Compressive Behavior of Magnesium Alloys: *Yong-Ha Jeong*¹; Sung-Tae Hong¹; Moon-Jo Kim²; Heung Nam Han²; James Magargee³; Jian Cao³; Geunan Lee⁴; Kyungsik Han⁵; ¹University of Ulsan; ²Seoul National University; ³Northwestern University; ⁴Korea Institute of Industrial Technology; ⁵Ulsan Techno Park

I14: The Electroplastic Tensile Behavior of Aluminum 6061 Alloys with Various Heat Treatment Conditions under a Pulsed Electric Current: *Hyeong-Ho Yu*¹; Sung-Tae Hong¹; Moon-Jo Kim²; Heung Nam Han²; Jian Cao³; Suk-Hyun Kim⁴; ¹University of Ulsan; ²Seoul National University; ³Northwestern University; ⁴Sejong Industrial Co.

I15: Characterization of Cu Tube Filled with Al Alloy Foam by Means of X-ray Computer Tomography: *Girolamo Costanza*¹; F. Mantineo²; Andrea Sili²; Maria Elisa Tata¹; ¹University of Rome "Tor Vergata"; ²University of Messina

I16: Enhanced Superplastic Deformation of Nanostructured 6061 Al Alloy Fabricated by Asymmetrical Rolling Method: I Putu Widiyantara¹; Young Gun Ko¹; *Bong Kwon Chung*¹; ¹Yeungnam University

Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers — Poster Session

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

Program Organizers: Naresh Thadhani, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

B5: Domain Re-orientation in a Magnetostrictive Material during High-strain Rate Loading and Inside a Biased Magnetic Field: *Dipankar Ghosh*¹; Abubakarr Bah²; Gregory Carman²; Guruswami Ravichandran¹; ¹California Institute of Technology; ²University of California Los Angeles

B6: Influence of Nano-particles Agglomeration and Nano-voids Clusters on Mechanical Behavior of Ceramic Nanocomposites under Dynamic Loading: *Evgeniya Skripnyak*¹; Vladimir Skripnyak¹; Irina Vaganova¹; Vladimir Skripnyak¹; ¹National Research Tomsk State University

B7: Natural Fiber Composite in a Novel Multi-material Ballistic Armor: *Luis Louro*¹; Willian Trindade¹; Alaelson Gomes¹; Arnaldo Ferreira¹; Sérgio

Monteiro¹; Marcelo Prado da Silva¹; Ricardo Weber¹; João Suarez¹; Carlos Chagas¹; Eduardo Lima¹; ¹Military Institute of Engineering

B8: Rapid Depolarization of Poled Ferroelectric Ceramics Using a Split Hopkinson Pressure Bar: *Dipankar Ghosh*¹; David Pisani²; Christopher Lynch²; Guruswami Ravichandran¹; ¹California Institute of Technology; ²University of California Los Angeles

B9: Shock-Induced Phase Transformations in Ce-Al Metallic Glass: *Alex Bryant*¹; Seung Soon Jang¹; Naresh Thadhani¹; ¹Georgia Institute of Technology

B10: Stress-induced Cell Membrane Deformation Due to the Photoacoustic Effect during Drug Delivery: *Stefany Holguin*¹; Aritra Sengupta¹; Mark Prausnitz¹; Naresh Thadhani¹; ¹Georgia Institute of Technology

B11: On Dynamic Void Growth by Dislocation Emission for Nano and Micro Size Voids: *Vlado Lubarda*¹; ¹UCSD

B12: Discussions of the Phase Diagram of Detonation Products Depicted by Numerical Calculation Method: *Xiaohong Wang*¹; ¹Dalian University of Technology

B13: Dynamic Contact Failure of Two Brittle Particles under Compression: Niranjan Parab¹; *Weinong Chen*¹; Kamel Fezzaa²; Shengnian Luo³; Xianghui Xiao³; ¹Purdue University; ²Argonne National Laboratory; ³Sichuan University

B14: Dynamic Deformation and Fracture Behavior of Ti-6Al-4V Alloy: Chunhuan Guo¹; Peijun Zhou¹; Zichuan Lu¹; *Fengchun Jiang*¹; ¹Harbin Engineering University

B15: Effect of Temperature and Strain Rate on Mechanical Response of ZEK100 Mg Alloy Sheet: *Srihari Kurukuri*¹; Michael Worswick¹; Raja Mishra²; Jon Carter²; ¹University of Waterloo; ²General Motors R & D

B16: Elastic-viscoplastic Anisotropic Modeling of Textured Metals and Validation Using the Taylor Cylinder Impact Test: Benoit Revil-Baudard¹; *Jeremy Kleiser*¹; Philp Flater¹; Oana Cazacu¹; ¹University of Florida

B17: Fragmentation and Constitutive Response of Tailored Mesostructured Aluminum-based Compacts: *Andrew Marquez*¹; Marc Meyers¹; David Benson¹; Melissa Ribero¹; Kenneth Vecchio¹; Christopher Braithwaite²; Timothy Weihs³; Nick Krywopusk³; ¹University of California, San Diego; ²Cavendish Laboratory; ³Johns Hopkins University

B18: Kinetics of Polymeric Gels: *Shengqiang Cai*¹; ¹UCSD

B19: Orientation Dependence of Shock Induced Dislocations in Tantalum Single Crystals: *Bo Pang*¹; I.P. Jones¹; Yu Lung Chiu¹; J.C.F. Milllett²; Glenn Whiteman²; N. K. Bourne²; ¹School of Metallurgy and Materials, University of Birmingham; ²AWE

B20: Ejecta Formation in Explosively Driven Two-shockwave Drive: *Shabnam Monfared*¹; William Buttler¹; Russell Olson¹; Frank Cherne¹; David Oro¹; Joseph Stone¹; James Hammerberg¹; ¹Los Alamos National Laboratory

B21: Simulation of Shaped Charge Collapse Using Smoothed Particle Hydrodynamics: *Édio Lima Júnior*¹; *Arnaldo Ferreira*¹; Luis Louro¹; ¹Military Institute of Engineering

EMPMD 2014 Technical Division Student Poster Contest — Posters

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

SP1: Ga-based Cu-to-Cu Interconnection with Pt UBM: *Hao-miao Chang*¹; Shih-kang Lin¹; ¹National Cheng Kung University

SP2: Exploring Nature's Missing Li₄Me₅O₁₂ Defect Spinel Oxides by Ab Initio Calculations: *Ping-chun Tsai*¹; Shih-kang Lin¹; Wen-Dung Hsu¹; ¹National Cheng Kung University (NCKU)

SP3: Thin Ferrite Films Compared to Oxide Coated Iron Powder for Electromagnetic Devices: *Katie Jo Sunday*¹; ¹Drexel University



SP4: Periodic Layer Formation in the Au-12Ge/Ni Diffusion Couple: *Ming-yueh Tsai*¹; Shih-kang Lin¹; ¹National Cheng Kung University

SP5: Interfacial Reaction of the Ni/Sn-Pd System and Ni-Pd-Sn Phase Relations Focused on the Sn-rich Alloys: *Md. Arifur Rahman*¹; W. Z. Hsieh¹; T. H. Yang¹; C. E. Ho¹; ¹Yuan Ze University

SP6: High Current Density Carbon Nanotube Field Emitters Using Copper Foam: *Gaurav Mittal*¹; Indranil Lahiri¹; ¹IIT Roorkee

SP7: Characterization of Interfacial Reactions in Cu/In/Ni Joints at 280 °C: *Yu-hsiang Wang*¹; Shih-kang Lin¹; ¹National Cheng Kung University Department of Material Science and Engineering

SP8: High Performance Li-ion Battery Based on CNT-SnO₂ Cross-stacked Structured Binder Free Anode: *Sameer Chouksey*¹; Indranil Lahiri¹; ¹IIT Roorkee

SP9: Development of Mn-Al-Ti Permanent Magnet Alloys: *Ozgun Acar*¹; Ilkay Kalay²; Y. Eren Kalay¹; ¹Middle East Technical University ; ²Cankaya University

SP10: Gas-Sensing Properties of Metal Oxides and Nanostructured Heterojunctions: *Marc Doran*¹; ¹Ohio State University

SP11: BSCF Colloid for Dip Coating Low Temperature Fuel Cell Cathodes: *John Schultz*¹; ¹The Ohio State University

EMPMD 2014 Technical Division Young Professional Poster Contest — Posters

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Young Professionals Committee

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

YP1: Optoelectrical Properties of Free-Standing InGaN Membranes: *Chia-Feng Lin*¹; ¹National Chung Hsing University

YP2: Why Does an Electric Current Change the Stability of Solder?: *Shih-kang Lin*¹; Chao-kuei Yeh¹; Yu-chen Liu¹; Masahiro Yoshimura¹; ¹National Cheng Kung University

Energy Technologies and Carbon Dioxide Management — Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Education Committee, TMS: Energy Committee

Program Organizers: Cong Wang, Northwestern University; Jan de Bakker, BBA, Inc; Cynthia Belt, Consultant; Animesh Jha, University of Leeds; Neale Neelameggham, Ind LLC; Soobhankar Pati, MOxST Inc.; Leon Prentice, CSIRO

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J3: Corrosion Behavior of Differently Heat Treated Steels in CCS Environment with Supercritical CO₂: *Anja Pfennig*¹; Phillipp Zastrow¹; Axel Kranzmann²; *Pedro Portella*²; ¹HTW Berlin; ²BAM Berlin

J4: Developing Segmented Polyurethanes as Solid-solid Phase Change Materials: *Claire Poh*¹; Vincent Blouin²; ¹Clemson University ; ²Clemson University

J5: Influence of Volatile Functionality on Pulverized Coal Explosivity: *Qinghai Pang*¹; ¹University of Science and Technology Beijing

J6: Thermodynamic and Experimental Study on the Steam Reforming Processes of Bio-oil Compounds for Hydrogen Production: *Huaqing Xie*¹; Qingbo Yu¹; Kun Wang¹; Xinhui Li¹; Qin Qin¹; ¹School of Materials and Metallurgy, Northeastern University

J7: Iron Ore Sinter Produced with Charcoal Aiming Diminish the Carbon Emissions: *Victor Telles*¹; Eduardo Junca¹; Girley Rodrigues¹; Jorge Tenório¹; Denise Espinosa¹; ¹University of Sao Paulo - USP

EPD 2014 Technical Division Student Poster Contest — Posters

Sponsored by: TMS Extraction and Processing Division

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

SP12: REE Selective Processing by Leaching and Chelating SPCs: *Sean Dudley*¹; Grant Wallace¹; ¹Montana Tech of the U of M

SP13: High-temperature Wetting of Cryolitic Melts and Liquid Aluminum on Graphite Cathode Materials: *Zhenhuan Huang*¹; Jilai Xue¹; Yanan Zhang¹; Liang Liu¹; ¹University of Science and Technology Beijing

SP14: Carbothermic Reduction of Synthetic Chromite with/without the Presence of Metallic Iron: *Xianfeng Hu*¹; Haijuan Wang²; Lidong Teng¹; Seshadri Seetharaman¹; ¹KTH-Royal Institute of Technology; ²University of Science and Technology, Beijing

SP15: Polyvinyl Alcohol Nanofibers Prepared by the ForcespinningTM Method: *Javier Acosta Martinez*¹; Alexandra Villarreal¹; Lee Cremer¹; Karen Lozano¹; ¹UTPA

SP16: Fabrication and Characterization of TiO₂/Glass Composites for Environmental Remediation: *Luis Laracuent*¹; Wesley Cuadrado¹; Jorge De Jesus¹; Liliana Hernandez²; Gerardo Nazario¹; O.Marcelo Suarez¹; ¹University of Puerto Rico Mayaguez

SP17: Effect of Nitride Coating on the Properties of Aluminum-silicon Composites Containing Borides: *Angel Rodriguez*¹; Oscar Marcelo Suarez¹; ¹University of Puerto Rico - Mayaguez Campus

SP18: The Study of Dephosphorization in Steel as a Function of Sulfur Content: *Brian Jamieson*¹; Kenneth Coley¹; ¹McMaster University

EPD 2014 Technical Division Young Professional Poster Contest — Posters

Sponsored by: TMS Extraction and Processing Division, TMS: Young Professionals Committee

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YP3: Study on Separation of Tin from a Low Grade Tin Concentrate through a Leaching and Low Temperature Smelting Process: *Yang Jianguang*¹; ¹Central South University

YP4: Ultra-High Temperature Molten-Oxide Electrolysis: *Rachel DeLucas*¹; Guillaume Lambotte¹; Antoine Allanore¹; ¹Massachusetts Institute of Technology

YP5: In-Situ CSLM Investigation on Dissolution of SiO₂ Particles in CaO-Al₂O₃-SiO₂ Slags: *Stefan Feichtinger*¹; Susanne Michelic¹; *Youn-Bae Kang*²; Christian Bernhard¹; ¹Montanuniversitaet Leoben; ²Pohang University of Science and Technology

YP6: Calcium-antimony Electrodes for Liquid Metal Batteries: Towards Grid-scale Electrochemical Energy Storage: *Takanari Ouchi*¹; Hojong Kim¹; Donald Sadoway¹; ¹MIT

Gamma TiAl Alloys 2014 — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Titanium Committee

Program Organizers: Young-Won Kim, Gamteck, Inc.; Wilfried Smarsly, MTU Aero Engines GmbH; Junpin Lin, University of Science and Technology Beijing; Dennis Dimiduk, Air Force Research Laboratory; Fritz Appel, Helmholtz Zentrum Geesthacht

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Session Chairs: Yongfeng Liang, University of Science & Technology Beijing; Thomas Voisin, CEMES-LOE/CNRS

B21: The Effect of Mould Pre-heat Temperature and Casting Dimension on the Reaction between TiAl Alloy and the Zirconia Investment Casting Moulds: *Chen Yuan*¹; Xu Cheng²; Grant Holt²; Paul Withey²; ¹University of Birmingham; ²University of Birmingham

B22: Directional Solidification of TiAl Alloys: *Yanqing Su*¹; Liangshun Luo¹; Xinzhong Li¹; Jingjie Guo¹; Hengzhi Fu¹; ¹Harbin Institute of Technology

B23: Cyclic Oxidation Resistance of High Niobium Containing TiAl Based Alloy with Erbium: *lihua Chai*¹; Ziqi Gong¹; Ziyong Chen¹; Zuoren Nie¹; ¹Beijing University of Technology

B24: Effects of Mould Shell Materials on Interface Reaction and Anti-oxidation of Investment Casting TiAl Alloy: *Xiao Shulong*¹; Xu Lijuan¹; Cao Shouzhen¹; Tian Jing¹; Chen Yuyong¹; ¹Harbin Institute of Technology

B25: Strain Rate Effects on Brittle-to-ductile Transition Temperature of TiAl Compounds: Xiang Zan¹; Li Ouyang¹; Yu Wang²; Weidong Song³; Yuehui He⁴; Yong Liu⁴; ¹Hefei University of Technology; ²University of Science & Technology of China; ³Beijing Institute of Technology; ⁴Central South University

B26: Microstructure and Properties of Ti-45Al-5.5(Cr,Nb,B,Ta) Alloy by Double Mechanical Milling and Hot Isostatic Pressing(HIP): *Xu Lijuan*¹; Xiao Shulong¹; Tian Jing¹; Yu Hongbao¹; Chen Yuyong¹; ¹Harbin Institute of Technology

B27: Thermodynamical Calculations Investigating the F-Effect for γ -TiAl Alloys in the Presence of Calcium: *Hans-Eberhard Zschau*¹; Michael Schütze¹; Mathias Galetz¹; ¹DECHEMA - Forschungsinstitut

B28: Composition, Structure and Properties of Vacuum Induction Melted and Hot Pressed Ti-42Al-5Mn Alloy: *Xiong Chao*¹; Zhang Long¹; Liu Kui¹; Li Yiyi¹; ¹Institute of Metal Research, Chinese Academy of Sciences

B29: Simulation on Extrusion Process of TiAl Large-scale Vacuum Arc Remelted Ingot: *Fan Gao*¹; ¹Beijing Institute of Aeronautical Materials

B30: Analysis of Solidification Procedures in Directionally Solidified Two-phase Gamma-TiAl Alloys Containing Beta Stabilizing Elements: *Myung-Hoon Oh*¹; Jong-Moon Park¹; Seong-Woong Kim²; Seung Eun Kim²; ¹Kumoh National Institute of Technology; ²KIMS

B31: The Effect of Milling Time on Ti-48%Al Composite Powder by Mechanical Alloying: Yi Feng¹; Lei Zhou¹; *Cai Lan*¹; ¹Kunming University of Science and Technology

B32: Seeded Growth of Ti-47Al-2Cr-2Nb PST Crystal: *Hao Jin*¹; Ronghua Liu¹; Yuyou Cui¹; Quangang Xian¹; Dongsheng Xu¹; Rui Yang¹; ¹Institute of Metal Research, Chinese Academy of Sciences

B33: Oxygen Reduction in TiAl Produced by the TiPro Process: *Kenneth Sichone*¹; Brian Gabbitas¹; ¹The University of Waikato

B34: Rolling and Grinding of Thin Sheets of Beta-Solidified Gamma TiAl Alloys: *Young-Won Kim*¹; Sang-Lan Kim²; ¹Gamteck, Inc.; ²UES, Inc.

General Recycling — General Recycling Poster Session

Sponsored by: TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Jeffrey S. Spangenberg, Argonne National Laboratory; Randolph Kirchain, Massachusetts Institute of Technology

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February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

Session Chair: Jeffrey Spangenberg, Argonne National Laboratory

J8: Characterization of Printed Circuit Boards from Scrap Printers: *Flávia Silvas*¹; Viviane Moraes¹; Guilherme Bortolini¹; Otavio Gomes²; Stoyan Gaydardzhiev³; Denise Espinosa¹; Jorge Tenorio¹; ¹Polytechnic School of University of São Paulo; ²Centre for Mineral Technology, CETEM; ³University of Liège

J9: Characterization of Recycled Glass Sintered with TiO₂ Nanoparticles Designed for the Remediation of Polluted Soils: *Wesley Cuadrado*¹; Anel Arroyo¹; Liliana Hernández¹; Gerardo Nazario¹; O. Marcelo Suárez¹; ¹University of Puerto Rico - Mayagüez

J10: Development of Recycling Process to Recovery of Metal Values from Spent Primary/Secondary Batteries Using Thermal Treatment: *Jei Pil Wang*¹; Shun Myung Shin²; ¹Pukyong National University; ²Korea Institute of Geoscience and Mineral Resources

J11: Separation of Manganese from Material Containing Co Using Mixture of Extractants: *Shun Myung Shin*¹; Sung ho Joo²; ¹Korea Institute of Geoscience & Mineral Resources (KIGAM); ²Korea University of Science & Technology

J12: The Effect of Ethanol Concentration for the Separation of Abs and Hips from Waste Electrical and Electronic Equipment (Weee) by Flotation Technique: Solange Utimura¹; *Jorge Alberto Tenorio*¹; Denise Espinosa¹; ¹University of São Paulo

J13: Convert Melting Slag Directly into High Basicity Glass-ceramic: *Li Yu*¹; Liu Xiaoming¹; Cang Daqiang¹; ¹University of Science and Technology Beijing, China

J14: Kinetic Study of Acid Copper Leaching from Waste Printed Circuit Board: *Franco Ramunno*¹; Viviane Moraes¹; Denise Espinosa¹; Jorge Tenório¹; ¹Universidade de São Paulo

J15: Life Cycle Based Greenhouse Gas Footprints of Metal Production with Recycling Scenarios: *Nawshad Haque*¹; Terry Norgate¹; Stephen Northey¹; ¹CSIRO

J16: Optimal Leaching on Hydrometallurgical Process of Recycling Batteries Using Less Energy and Reactants: *Felipe Costa Hashimoto Bertin*¹; Rodrigo de Souza Daltí Pereira¹; Denise Crocce Romano Espinosa¹; Jorge Alberto Soares Tenório¹; ¹Polytechnic School of the University of São Paulo

J17: Manganese Ferrite Nanoparticles Production from the Leaching of Batteries by Reductive Precipitation by Sodium Citrate: Lucas Martins¹; *Daniella Buzzi*¹; Viviane Moraes¹; Denise Espinosa¹; Jorge Alberto Tenório¹; ¹Polytechnic School of the University of São Paulo

J18: Research on the Fundamental Characteristic of Dust and Sludge Containing Iron from Steel Enterprise: *Rui Mao*¹; ¹University of Science and Technology Beijing

J19: An Investigation on Controllable Electro-healing Cracks in Nickel: Xiangui Zheng¹; *Yinong Shi*¹; Ke Lu¹; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences

J20: Study of Degradation of Ceramic Bodies Incorporated with Ornamental Rock Waste Obtained from Test of Wetting and Drying Cycles: *Gustavo Xavier*¹; Jonas Alexandre¹; Fernando Jr¹; Paulo Maia¹; Afonso Azevedo¹; ¹UENF



J21: Production of Ornamental Compound Marble with Marble Waste and Unsaturated Polyester: *Carlos Gomes Ribeiro*¹; Rubén Jesus Sánchez Rodrigues²; Carlos Maurício Fontes Vieira²; ¹IFES; ²UENF

J22: Determination of Apparent Dry Density for Ternary Mixture of Crushed Marble Waste: *Carlos Gomes Ribeiro*¹; Rubén Jesus Sánchez Rodrigues²; Carlos Maurício Fontes Vieira²; ¹IFES; ²UENF

J23: Experimental Study on Reduction-magnetic Separation Process of Pickling Sludge: *Xulong Liu*¹; Qing Xiao¹; Jing Zhang¹; Qiuju Li¹; ¹Shanghai Key Laboratory of Modern Metallurgy & Materials Processing, Shanghai University

J24: The Removal of Heavy Metals and Upgrading Crude Bio-oil from Pteris Vittata Stems and Leaves Harvest Using Hydrothermal Upgrading Process: *Yang Jian-guang*¹; ¹Central South University

J25: Silver Recovery from Industrial Wastes Using an Electrochemical Reactor REOV-01: *Pedro Ramirez Ortega*¹; Juan Carlos Gonzalez Islas¹; Luis Garcia Lechuga¹; Laura García¹; ¹Universidad Tecnológica de Tulancingo

J26: Indium Recovery from Discarded Light Emitting Diode (LED) Liquid Crystal Display (LCD) TVs: Influence of Leaching Reagents: *Hugo Hashimoto*¹; Priscilla Hanashiro¹; Viviane Moraes¹; Jorge Alberto Tenório¹; Denise Espinosa¹; ¹Escola Politécnica da Universidade de São Paulo

High-temperature Gamma (f.c.c.) /Gamma-Prime (L12 structure) Co-Al-W Based Superalloys — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee

Program Organizers: David Seidman, Northwestern University; David Dunand, Northwestern University; Chantal Sudbrack, NASA Glenn Research Center; Carelyn Campbell, National Institute of Standards and Technology; Ursula Kattner, National Institute of Standards and Technology; David Dye, Imperial College

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B36: The Role of Ti on Reducing the Misfit of a Co-Al-W Alloy: *Pengjie Zhou*¹; ¹Jiangsu University of Science and Technology

High-temperature Material Systems for Energy Conversion and Storage — Poster Session

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Energy Conversion and Storage Committee

Program Organizers: Kyle Brinkman, Savannah River National Laboratory (SRNL); Xingbo Liu, West Virginia University; Kevin Huang, University of South Carolina

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Session Chair: To Be Announced

B37: Ion-exchanged Transition Metal Oxides for Enhanced Lithium Ion Storage at Elevated Temperatures: *Wei Zhang*¹; Jasper Wright¹; Dawei Liu¹; ¹Alfred University

Hume-Rothery Award Symposium: Thermodynamics and Kinetics of Engineering Materials — Poster Session

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Hans Juergen Seifert, Karlsruhe Institute of Technology (KIT); Alan Luo, The Ohio State University; Peter Uggowitzer, ETH Zürich; Fan Zhang, CompuTherm, LLC

Monday PM Room: Sails Pavilion
February 17, 2014 Location: San Diego Convention Center

Session Chair: Hans Seifert, Karlsruhe Institute of Technology

M1: Thermodynamic Estimation of Silicon Tetrachloride to Trichlorosilane for a Low Temperature Hydrogenation Process: *Jijun Wu*¹; Wenhui Ma¹; Zhengjie Chen¹; Kuixian Wei¹; Bin Yang¹; Yongnian Dai¹; ¹Kunming University of Science and Technology

LMD 2014 Technical Division Student Poster Contest — Posters

Sponsored by: TMS Light Metals Division

Monday PM Room: Sails Pavilion
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SP19: Interaction between {10-12} Twins and Stacking Faults in a Mg-Y Alloy: *Dalong Zhang*¹; Baolong Zheng¹; Yizhang Zhou¹; Subhash Mahajan¹; Enrique Lavernia¹; ¹University of California-Davis

SP20: Dynamic Precipitation and Recrystallization in Magnesium Alloys: Effects on Grain Size and Texture: *Abu Syed Humaun Kabir*¹; Mehdi Sanjari¹; Jing Su¹; In-Ho Jung¹; Stephen Yue¹; ¹McGill University

SP21: An Atomistically-informed Energy Based Theory of Environmentally Assisted Failure: *Sriram Ganesan*¹; Veera Sundararaghavan¹; ¹Department of Aerospace Engineering, University of Michigan-Ann Arbor

SP22: Electric Heating Behavior of Interlaminar Region in ZnO/Woven Carbon Fiber Reinforced Composites: *Kyungil Kong*¹; Biplab K. Deka¹; Myungsoo Kim¹; Aeri Oh²; Heejune Kim²; Young-Bin Park¹; Hyung Wook Park¹; ¹UNIST; ²LG Hausys R&D Center

SP23: Localized Mechanical Properties of Friction Stir Processed Sensitized 5XXX Al: *Caroline Schreck*¹; Kim Tran¹; Jennifer Wolk¹; Marc Zupan²; ¹Naval Surface Warfare Center; ²University of Maryland, Baltimore County

SP24: Use of High Energy Diffraction Microscopy to Study the Stress Relaxation of AZ31: *Wenli Tang*¹; Armand Beaudoin¹; Peter Kenesei²; Dallas Trinkle¹; ¹University of Illinois at Urbana and Champaign; ²Argonne National Laboratory

SP25: Strengthening of Al and Al-Mg Alloy Wires by Melt Inoculation with Al/MgB₂ Nanocomposite: *Alexandra Padilla*¹; Raul Marrero¹; David Florian¹; Oscar Marcelo Suarez¹; ¹University of Puerto Rico, Mayagüez Campus

LMD 2014 Technical Division Young Professional Poster Contest — Posters

Sponsored by: TMS Light Metals Division, TMS: Young Professionals Committee

Monday PM
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YP7: Effect of Carbon Nanotube (CNT) Diameter on the Microstructure and Properties of Al-CNT Composites: *Srinivasa Bakshi*¹; ¹Indian Institute of Technology Madras

YP8: Magnesium Biomaterials - The Future of Structural Implants: *Nicholas Kirkland*¹; ¹Nagasaki University

YP9: Analysis the Recovery of Mechanical Properties of Aluminum Alloy Al-Zn-Mg T5 and 6082 T6 After the TIG Welding Process: *Gabriela Bruno*¹; ¹ALCOA

YP10: Evolution of Metastable Phases in High-pressure Die Cast Mg-Nd Alloy at 177°C: A Coupled Structural and Compositional Characterization: *Deep Choudhuri*¹; *Rajarshi Banerjee*¹; *Mark Gibson*²; *Nilesh Dendge*¹; *Soumya Nag*¹; ¹University of North Texas; ²CSIRO

Magnesium Technology 2014 — Poster Session

Sponsored by: TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Martyn Alderman, Magnesium Elektron; Norbert Hort, Helmholtz-Zentrum Geesthacht; Michele Manuel, University of Florida; Neale Neelameggham, Ind LLC

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I17: Mechanical Anisotropy in a Thermo-mechanically Processed Magnesium Alloy at a Wide Range of Strain Rate and Temperature: *Farhoud Kabirian*¹; *Akhtar Khan*¹; ¹University of Maryland, Baltimore County

I18: The ExoMet Project: EU/ESA Research on High-performance Light-metal Alloys and Nanocomposites: *Wim Sillekens*¹; *David Jarvis*¹; ¹European Space Agency

I19: Effects of Different Strain and Heating Factor on the Microstructure and Compressive Properties of AZ61 Mg Alloy Produced by SIMA Process: *Yi Liang Ye*¹; *Fei Yi Hung*¹; *Truan Sheng Lui*¹; *Li Hui Chen*¹; ¹National Cheng Kung University

I20: An Investigation of the Local Mechanical Response at the Grain Level for Magnesium: *Ghazal Nayyeri*¹; *Warren Poole*¹; *Chadwick Sinclair*¹; ¹University of British Columbia

I21: Effect of Li and Trace Element Addition on Microstructure and Mechanical Properties of Mg-Zn Based Alloys: *Hyeon-Taek Son*¹; *Yong-Ho Kim*¹; *Jung-Han Kim*¹; *Jeong-Won Choi*¹; *Hyo-Sang Yu*¹; ¹Korea Institute of Industrial Technology

I22: Effect of Ti Based Additives on Hydrogen Storage Properties of Magnesium Hydride: *Chengshang Zhou*¹; *Zhigang Zak Fang*¹; *Chai Ren*¹; *Jingzhu Li*¹; ¹The University of Utah

I23: Flow Behavior and Hot Workability of Extruded ZK60 Magnesium Alloy: *Shiyi Wang*¹; *Lei Gao*²; *Alan Luo*³; *Xiaoqin Zeng*¹; *Jeff Wang*²; ¹Shanghai Jiao Tong University; ²General Motors China Science Lab; ³General Motors Global Research and Development Center

I24: Mechanical Properties of Magnesium and AZ31 Nano-pillars: *Zachary Aitken*¹; *Julia Greer*¹; ¹CalTech

I25: Microscale Plastic Strain Distribution in Slip Dominated Deformation of Mg Alloys: *Chad Sinclair*¹; *Guilhem Martin*¹; *Ricardo Lebensohn*²;

¹University of British Columbia; ²Los Alamos National Laboratory

I26: Advanced Performance of Magnesium Alloy ZK60 Fabricated by a New Integrated Process Providing a Conduit for Transfer to Industrial Manufacturing: *Dmitry Orlov*¹; *Kei Ameyama*¹; *Yuri Estrin*²; ¹Ritsumeikan University; ²Monash University

I27: Sensory Magnesium Components – Online-Measurement of Static and Dynamic Loads Utilizing Magnetic Magnesium Alloys: *Christian Klose*¹; *Christian Demminger*¹; *Hans Jürgen Maier*¹; ¹Leibniz Universität Hannover

I28: Coupled Modeling of Electromagnetic Field, Fluid Flow, Heat Transfer and Solidification during Low Frequency Electromagnetic Casting of AZ80 Magnesium Alloys: *bai yuanyuan*¹; ¹Northeastern University

I29: Evaluation of Fracture Criteria of Mg-Alloy Sheets during Formability Testing: *Yueqian Jia*¹; *Yuanli Bai*¹; *Govindarajan Muralidharan*²; *T. R. Muth*²; *Yanli Wang*²; ¹University of Central Florida; ²ORNL

I30: Effect of Friction Stir Processing on Toughness of WE43 Alloy: *S. Das*¹; *N. Kumar*¹; *R. Mishra*¹; *K. Doherty*²; *K. Cho*³; *B. Davis*⁴; *R. Delorme*⁴; ¹University of North Texas; ²Army Research Laboratory; ³Army Research Laboratory; ⁴Magnesium Elektron

I31: Effect of Processing Parameter on the Microstructural Evolution and Mechanical Properties of a WE43 Alloy during Friction Stir Welding: *S. Palanivel*¹; *R.S. Mishra*¹; *B. Davis*²; *R. Delorme*²; *K.J. Doherty*³; *K.C. Cho*³; *J.A. Baumann*⁴; ¹University of North Texas; ²Magnesium Elektron North America Inc.; ³U.S Army Research Laboratory; ⁴The Boeing Company

I32: A New Microsegregation Model for the Prediction of as Cast Microstructure of Mg Alloys: *Manas Paliwal*¹; *In-Ho Jung*¹; ¹McGill University

I33: Characterization of Microstructure and Mechanical Properties of Twin Roll Strip-cast Mg-Al-X Alloys: *Sang Jun Park*¹; *Hua Chul Jung*¹; *Kyung Hoon Lee*²; *Kwang Seon Shin*¹; ¹Magnesium Technology Innovation Center / Seoul National University; ²Solution Lab

I34: Forming an Automobile Rear Seat Frame Using Magnesium Alloy Extrudites: *Ali Kaya*¹; *Deniz Tuncer*²; *Alev Osma*²; ¹Mugla Sitki Kocman University; ²Ford Co.

I35: Influence of Initial Microstructure and Process Parameter on the Microstructural Evolution of a WE43 Alloy during Friction Stir Welding: *S. Palanivel*¹; *R.S. Mishra*¹; *B. Davis*²; *R. Delorme*²; *K.J. Doherty*³; *K.C. Cho*³; ¹University of North Texas; ²Magnesium Elektron North America Inc.; ³U.S Army Research Laboratory

I36: A Multiscale Investigation of the Effect of Yttrium on Deformation in Magnesium: *Mehul Bhatia*¹; *Kiran Solanki*¹; *Gang Lu*²; ¹Arizona State University; ²California State University Northridge

I37: Deformation Behaviour of AZ80 Alloy and Pure Magnesium under Uniaxial and Plane Strain Compression: *Hamid Azizi-Alizamini*¹; *Guilhem Martin*¹; *Warren Poole*¹; ¹The University of British Columbia

I38: Corrosion Protection of Magnesium Alloys Using Ammonium-Phosphate Ionic Liquids- Produced Conversion Coatings: *Hassan Elsentriecy*¹; *Jun Qu*¹; *Huimin Luo*¹; *Harry Meyer*¹; *Michael Brady*¹; ¹Oak Ridge National Laboratory

I39: Magnesium Electrorefining in Non-aqueous Electrolyte at Room Temperature: *Kyungjung Kwon*¹; *Jesik Park*²; *Priyandi Kusumah*¹; *Bonita Dilasari*¹; *Hansu Kim*³; *Churl Kyoung Lee*²; ¹Sejong University; ²Kumoh National Institute of Tech.; ³Hanyang University

I40: Investigation of the Corrosion for Mg-Li-xGd-yY (x=7,8,9,10,11 wt%;y=1,2,3,4,5 wt%) Alloys: *Min Li*¹; *Guangchun Yao*¹; *Yihan Liu*¹; *Mengxiao Chen*¹; ¹Northeastern University

I41: Formation of Tetrahedron MgYNi4 and the Catalytic Effect on Hydrogenation Properties of Mg-Ni Alloy: *Wenjie Song*¹; *Jinshan Li*¹; *Tiebang Zhang*¹; *Xiaojiang Hou*¹; *Hongchao Kou*¹; ¹Northwestern Polytechnical University



I42: Reversible Hydrogenation of Mg Synergistically Catalysed by Amorphous Mg₂Ni Alloy and MWCNTs at Room Temperature: *Xiaojiang Hou*¹; Rui Hu¹; Tiebang Zhang¹; Hongchao Kou¹; Wenjie Song¹; Jinshan Li¹; ¹Northwestern Polytechnical University

I43: Additive Manufacturing of Mg Powder via Solid State Wrought Metal Deposition Process: *Kumar Kandasamy*¹; Jacob Calvert¹; Liam Renaghan¹; Kevin Creehan¹; Jeffrey Schultz¹; ¹Aeroprobe Corporation

I44: Atomistic Modeling Study on the Interactions between the Liquid Nitrogen and Magnesium-based Alloys during Powder Metallurgy (PM) Process: *Chang-Soo Kim*¹; Marjan Nezafati¹; J.B. Ferguson¹; Kyu Cho²; ¹University of Wisconsin-Milwaukee; ²Army Research Lab

I45: Effects of Processing Routes on Powder Metallurgy Magnesium Alloys: D Kapoor¹; R Sadangi¹; T Zahrah²; R Tandon³; D Madan³; ¹US Army ARDEC; ²Matsys Inc; ³Magnesium Elektron Powder Products

I46: The Effects of Advanced Surface Treatments on Residual Stress, Microstructure, Fatigue Life and Corrosion Properties of Magnesium Alloy AZ91: *Joochan Kim*¹; James Russo¹; Abhishek Telang¹; Seetha Mannava¹; Dong Qian²; Vijay Vasudevan¹; ¹University of Cincinnati; ²University of Texas at Dallas

I47: Effects of Surface Pretreatment and Processing Condition on the Film Properties of PEO Processed Strip-cast AZ31+Ca Mg Alloys: *Hwa Chul Jung*¹; Sun Hwan Kwon¹; Arumugam Madhan Kumar¹; Young Hee Park²; Kwang Seon Shin¹; ¹Magnesium Technology Innovation Center, Seoul National University; ²Research Institute of Industrial Science and Technology

I48: Characterization of Surface and Corrosion Behavior of PEO Coatings on Strip-Cast AZ31Mg Alloy in 3.5% NaCl Solution: Arumugam Madhan Kumar¹; Hwa Chul Jung¹; *Kwang Seon Shin*¹; ¹Seoul National University,

I49: Studies on Corrosion Behavior of AZ91D Magnesium Alloy and Al-Si Alloy with Epoxy,Al Power Coatings: *Manivannan Subramanian*¹; Kumaresh Babu S.P¹; ¹National Institute of Technology, Tirchirappalli

I50: The Evaluation of Histological Methods for Biodegradable Magnesium and Magnesium Alloys: *Hyung-Seop Han*¹; Jee Hye Lo Han¹; Yu-Chan Kim¹; Jee Wook Lee²; Seok-Jo Yang³; Hyun-Kwang Seok¹; ¹Korea Institute of Science and Technology; ²Kookmin University; ³Chungnam National University

I51: Effect of Sn Microstructure and Tensile Properties of Hot-rolled Mg-Zn Sheet: *Seung Won Kang*¹; Heon Kang¹; Donghyun Bae¹; ¹Yonsei University

I52: Mechanical Properties Factor Decomposition in Mg-alloys: *Isaac Toda-Caraballo*¹; Enrique Galindo-Nava¹; Pedro Rivera-Díaz-del-Castillo¹; ¹University of Cambridge

I53: LPSO-type Magnesium Alloys with High Strength and High Flame Resistance: *Yoshihito Kawamura*¹; Jonghyun Kim¹; ¹Kumamoto University

I54: Comparative Studies on Microstructure, Tensile Properties and Formability of AZ31 and ZX31 Sheets Prepared by Hot Rolling and Annealing Treatment: Jong Yun Lee¹; *Won Tae Kim*²; Do Hyang Kim¹; ¹Yonsei University; ²Cheongju University

I55: Thermodynamic Refinement of Mg-RE-based Ternary Systems by Considering As-cast Microstructures: Hailin Chen¹; *Qing Chen*¹; Johan Bratberg¹; Paul Mason¹; Anders Engström¹; ¹Thermo-Calc Software AB

I56: Precipitation Evolution and Kinetics in a Magnesium-neodymium-zinc Alloy: *Amirreza Sanaty Zadeh*¹; Xiangyu Xia¹; Alan Luo²; Donald Stone¹; ¹University of Wisconsin, Madison; ²Generals Motor Research and Development Center

Magnetic Materials for Energy Applications IV — Poster Session

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS; Magnetic Materials Committee
Program Organizers: Thomas G. Woodcock, IFW Dresden; Julia Lyubina, Evonik Industries AG; Matthew Willard, Case Western Reserve University

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

Session Chair: Hossein Sepehri Amin, NIMS

J27: Sm-Co Thin Layers, Magnetic and Structural Study: Marwen Hannachi¹; Wajdi Belkacem¹; Rachid Belhi¹; Lotfi Bessais²; *Najeh Mliki*¹; ¹Université de Tunis El Manar; ²CMTR, ICMPE, UMR 7182, CNRS-Université Paris 12

J28: Development of Mn-Al-Ti Permanent Magnet Alloys: *Ozgun Acar*¹; Ilkay Kalay²; Eren Kalay¹; ¹METU; ²Cankaya University

J29: Particle Size Dependence on Magnetic Properties of AlNiCo Powders: *Ayse Merve Genç*¹; Yunus Eren Kalay¹; ¹Middle East Technical University

J30: Magnetocaloric Effect in Ni₂Mn-X-Y Heusler Alloys: *Mikhail Drobozyuk*¹; ¹Chelyabinsk State University

J31: The Influence of Antiferromagnetic Anisotropy on the Magnetocaloric Effect: *Bruno Alho*¹; Alexandre Carvalho²; Pedro von Ranke¹; ¹UERJ; ²Universidade Federal de São Paulo

J32: Studies on the Magnetocaloric Effect of LaFe_{12.2x}Si_xCo_{0.8} and the Chemical Hydrogenation Methods of Pure LaFe_{11.8}Si_{1.2} Alloys: *Patryk Włodarczyk*¹; Lukasz Hawelek¹; Aleksandra Kolano-Burian¹; Marcin Polak¹; Artur Chrobak²; ¹Institute of Non-Ferrous Metals; ²University of Silesia

J33: Magneto-structural Studies of the Mn_{2-x}Fe_xP_{1-y}Ge_y Compounds Prepared by Solid State Vacuum Sintering: *Lukasz Hawelek*¹; Patryk Włodarczyk¹; Aleksandra Kolano-Burian¹; Malgorzata Kaminska¹; Ritta Szymczak²; Igor Radelytskyi²; Henryk Szymczak²; ¹Institute of Non-Ferrous Metals; ²Institute of Physics, Polish Academy of Sciences

J34: Magnetic Properties and Giant Magnetoimpedance Effect in Nanocrystalline Microwires: *Valentina Zhukova*¹; Ahmed Talaat¹; Mihail Ipatov¹; Juan Blanco²; Margarita Churyukanova³; Sergei Kaloshkin⁴; Elena Kostitcyna⁴; Evgenia Shuvaeva⁴; Lorena Gonzalez-Legarreta⁵; Blanca Hernando²; Arcady Zhukov⁶; ¹Basque Country University, Dpto. Física de Materiales; ²Basque Country University, Dpto. de Física Aplicada; ³National Univer. of Science and Technology «MISIS», ; ⁴National University of Science and Technology «MISIS»; ⁵Universidad de Oviedo; ⁶Basque Country University and IKERBASQU

Materials and Fuels for the Current and Advanced Nuclear Reactors III — Poster Session

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

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

L38: A Theoretical Model of Corrosion Rate Distribution in Liquid LBE Flow Loop at Higher Temperature Ranges: *Miroslav Popovic*¹; Peter Hosemann¹; Cristian Cionea¹; David Fraser¹; ¹University of California Berkeley

L39: Comparison of EAM and MEAM Interatomic Potentials for Metallic Uranium: *Elton Chen*¹; Benjamin Beeler²; Chaitanya Deo²; Michael Baskes³; Maria Okuniewski⁴; ¹Georgia Institute of Technology ; ²Georgia Institute of Technology; ³Los Alamos National Laboratory; ⁴Idaho National Laboratory

L40: Dynamics of Deformation Localization and Dislocation Channeling in Irradiated Austenitic Stainless Steels: *M. N. Gussev*¹; K. Field¹; J. Busby¹; T. Byun¹; ¹Oak Ridge National Laboratory

L41: Hardness Recovery under Isochronal Annealing of Highly Irradiated RPV Steels: *Peter Wells*¹; G. Odette¹; Tim Milot¹; Takuya Yamamoto¹; Jim Cole²; Brandon Miller²; ¹University of California Santa Barbara; ²Idaho National Laboratory

L42: Interdiffusion between of Mg and AA6061 Aluminum Alloy: *Mian Fu*¹; Catherine Kammerer¹; Le Zhou¹; Dennis Keiser²; Yongho Sohn¹; ¹University of Central Florida; ²Idaho National Laboratory

L43: Irradiation Effect of P92 Steel during Ions Irradiations at Elevated Temperature: *Yinzhong Shen*¹; Jun Zhu¹; ¹Shanghai Jiao Tong University

L44: Remote Exterior Condition Monitoring System for Spent Nuclear Fuel Dry Storage Containers: *Michael Hurley*¹; Vikram Patel¹; Brian Jaques¹; John Youngsman¹; Jacqueline Hodge¹; Sin Ming Loo¹; Darryl Butt¹; ¹Boise State University

Materials for High-temperature Applications: Next Generation Superalloys and Beyond — Poster Session

Sponsored by: TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Refractory Metals Committee

Program Organizers: Omer Dogan, DOE National Energy Technology Laboratory; Panos Tsakiroopoulos, University of Sheffield; Xingbo Liu, West Virginia University; Paul Jablonski, DOE National Energy Technology Laboratory; Junpin Lin, University of Science and Technology Beijing

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

B38: Study of Oxidation and High Temperature Corrosion of AISI Type 430 Stainless Steel: *T.A. Vijey*¹; ¹Bullststreet Research Co.

B39: Hot tensile Deformation Behavior and Microstructural Evolution of Haynes 230 and Inconel 617: Kyle Hrutkay¹; *Djamel Kaoumi*¹; ¹The University of South Carolina

B40: Effect of Yttrium on Microstructures, Mechanical Property and Oxidation Property at Elevated Temperature of Inconel 713C: *Kee-Do Woo*¹; Dong-Soo Kang¹; Dong-Gun Kim¹; Dae-Young Kim¹; Whang-Jin Kang¹; Eun-Jeong Jo¹; ¹Chonbuk National University

B41: Fabrication and Characterization of Tungsten-matrix Composites Reinforced by Copper-coated Tungsten Wire: *Kevin Cunningham*¹; G. Robert Odette¹; Frank Zok¹; Kirk Fields¹; David Gragg¹; Charles Henager²; Richard Kurtz²; ¹University of California, Santa Barbara; ²Pacific Northwest National Laboratory

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; Lifeng Zhang, University of Science and Technology Beijing; Antoine Allanore, Massachusetts Institute of Technology; Cong Wang, Northwestern University

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

D1: A Process Map for a Local Extrusion at the Cu-Al Contact Surface in Hydrostatic Extrusion of Cu-clad Al Bar at Warm Temperatures: *Yong-Shin Lee*¹; Sang-Hun Yoon¹; Sangmok LEE²; Jongsup Lee²; Geun-An Lee²; ¹Kookmin University; ²KITECH

D2: Effects of Niobium Alloying on the Micostructure and Mechanical Properties of Bainite Ductile Iron: *Liang Chang*¹; Yongsheng Yan¹; Xiangru Chen¹; Qin Hua¹; Qijie Zhai¹; ¹Shanghai University

D3: Bioleaching and Electrobioleaching of Low Grade Copper Sulfide Ore(Chalcopyrite) of Sarcheshmeh Copper Mine: *Hossein Ehtiman*¹; ¹GolGohar Mining & Industrial Company

D4: Computational Study of Texture Development During Templated Grain Growth: *Jie Zhou*¹; Yu Wang¹; ¹Michigan Technological University

D5: Determination and Optimization Best Condition for Bioleaching of Sulfide Low Grade Copper Ore by Using DOE(Design of Experimental) Method and Define a Mathematical Equation: *Hossein Ehtiman*¹; ¹GolGohar Mining & Industrial Company

D6: Dielectric Properties and Microwave Drying Characteristics of CuCl Residue Filter Cake: Zhan Guo¹; *Shao Ju*¹; ¹Kuming University of Science and Technology

D7: Dissolution Behavior of Magnesia in Hydrochloric Acid with Strong Brine: *Zunyu Hu*¹; Weizhong Ding¹; Dingsheng Tan¹; Shuqiang Guo¹; ¹Shanghai Key Laboratory of Modern Metallurgy & Materials Processing, Shanghai University

D8: Distribution of P₂O₅ between Solid Solution and Liquid Phase in CaO-SiO₂-Fe₂O₃ System Containing Na₂O or B₂O₃: Senglin Xie¹; *Lejun Zhou*¹; Wanlin Wang¹; ¹Central South University

D9: Effect of M-EMS on the Macroscopic Quality of TP347 Heat-resistant Stainless Steel Billet: *Zhou Cai*¹; ¹Chongqing University of Science and Technology

D10: Effect of Uneven Solidification End on Soft Reduction Zone in Wide-thick Slab Continuous Casting Process: *Cheng Ji*¹; Miaoyong Zhu¹; Yogeshwar Sahai²; ¹Northeastern University of China; ²The Ohio State University

D11: Effects of Solidification Conditions on As-cast Structure of Ferritic Stainless Steel in Continuous Casting: *Junjie Sun*¹; Cheng Zhang¹; Jingzheng Ye¹; Honggang Zhong¹; Qijie Zhai¹; ¹Shanghai University

D12: Effects of Start and Finish Cooling Temperatures on Microstructure and Mechanical Properties of Low-Carbon High-strength and Low-yield Ratio Bainitic Steels: *Dong Ho Lee*¹; Hyo Kyung Sung¹; Sunghak Lee¹; Nack J Kim¹; Sang Yong Shin²; ¹POSTECH; ²Department of Microstructure Physics and Alloy Design/Max-Planck-Institut für Eisenforschung GmbH

D13: Electrowinning of Silicon with Liquid Electrodes: *Ming Jia*¹; Yun Cheng¹; Zhongliang Tian¹; Yanqing Lai¹; Yexiang Liu¹; ¹Central South University

D14: Experimental Study and Characterization on Vacuum Carbonitriding Process for 20Cr₂Ni₂A Steel: Yingtao Zhang¹; Shaofeng Du²; Wenjun Zhao²; Gang Wang³; Yiming Rong³; ¹Chongqing University; ²Inner Mongolia Fist Machinery Group Co., Ltd.; ³Tsinghua University

D15: Fabrication of Functionally Graded Materials by Directional Solidification Process under a Transverse Magnetic Field: *Dafan Du*¹; Xi Li¹; Yves Fautrelle²; ¹Shanghai University; ²Grenoble Institute of Technology

D16: Hybrid Porous Metal of Nano-micro Double Size and Regular-random Bimodal: Xingming Zhang¹; Huawei Zhang¹; *Yanxiang Li*¹; ¹Tsinghua University

D17: Hydraulic Simulation of Fluid Flow in Beam Blank Continuous Casting Mold with Double Nozzles: Leilei Zhang¹; *Dengfu Chen*¹; Mujun Long¹; Xin Xie¹; Xing Zhang¹; Youguang Ma¹; ¹Chongqing University

D18: Simulation of Solidification Process of Steel Ingot under Different Thermal Boundary Conditions: *Jian Zhao*¹; Jieyu Zhang¹; Bo Wang¹; Zheng Chen¹; Jie Ma¹; ¹Shanghai University

D19: Investigation on Non-Metallic Inclusions of IF Steel in RH Refining Process: *Shunxi Wang*¹; Jiongming Zhang²; Wei Song²; Maokang Li²; ¹School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing; ²School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing

D20: Isothermal Bainite Transformation of Cr₅ Steel under Pulsed Current and Pulsed Magnetic Field Treatment: *Xin Xia*¹; Lijuan Li¹; Zheng Lu¹; Qijie Zhai¹; Qingchun Li²; ¹Shanghai University; ²Liaoning University of Technology

D21: Maximum Rate of Pulverized Coal Injection into Blast Furnace with Consideration of Coke Fines: *Qi Liu*¹; Susen Cheng¹; ¹University of Science and Technology Beijing

D22: Microstructural Characterization of Aluminum Metal Matrix Composite Prepared by In Situ Method: *Dumitru Mitrica*¹; Marian Burada¹; Raluca Maria Florea²; Mihai Ghita¹; Elvira Alexandrescu³; Vasile Soare¹; Petru Moldovan⁴; ¹National Research & Development Institute for nonferrous and Rare Metals – IMNR; ²"Gheorghe Asachi" Technical University of Iasi; ³National Research and Development Institute for Gas Turbines COMOTI of Bucharest; ⁴Politehnica University of Bucharest

D23: Modeling of Magnetohydrodynamic, Thermal and Solidified Behavior in Electroslag Remelting Process: *Qiang Wang*¹; Zhu HE²; Baokuan LI¹; ¹Northeastern University of China; ²Wuhan University of Science and Technology

D24: New Methodology of Enhancing Etching Factor of Copper Pattern for Advanced Packages: Hai-Joong Lee¹; *Hyo-Soo Lee*¹; ¹KITECH

D25: Phase Composition of Scale Layer formed during Continuous Casting: Nan Wang¹; Jianhong Dong¹; Bo Li¹; Min Chen¹; *Cuihuan Huang*¹; ¹Northeastern University

D26: Pressureless Sintering of Boron Carbide: *Habibollah Amini Rastabi*¹; ¹Islamic Azad University

D27: Properties of Cu-based Oxygen Carrier Used in Chemical Looping Air Separation (CLAS): *Kun Wang*¹; Qingbo Yu¹; Qin Qin¹; Wenjun Duan¹; ¹Northeastern University

D28: Removing Fluorite and Calcite from Scheelite during Flotation Separation Process with Addition of Calcium- and Sodium-Containing Reagents: *Liang Liu*¹; Jilai Xue¹; Jun Zhu¹; ¹University of Science and Technology Beijing

D29: Synthesis of Titanium Dioxide by Microwave Solid State Method and Its Photocatalytic Property: Kun Yang¹; ¹Kunming University of Science and Technology

D30: Microstructure Modification for Semisolid Slurry of al-4.5wt.%cu Alloy by Pulse Magneto-oscillation Treatment: ZhiShuai Xu¹; *ZhiChen Zhang*¹; QiXin Li¹; Dong Liang¹; Qijie Zhai¹; YongYong Gong¹; ¹Shanghai University

D31: Simulation of Solidification Microstructure in Austenitic Stainless Steel Twin-roll Strip Casting Based on CAFE Model: *Jie Ma*¹; JieYu Zhang¹; Bo Wang¹; Jian Zhao¹; ShunLi Zhao²; Guangxin Wu¹; ¹Shanghai University; ²Baoshan Iron & Steel Co., Ltd.

D32: Statistical Estimation of Dislocation Pinning at Precipitates, Voids and Bubbles: *Amlan Dutta*¹; M Bhattacharya²; P. Barat²; ¹S. N. Bose National Centre for Basic Sciences; ²Variable Energy Cyclotron Centre

D33: Effect of MN, NI Contents on Microstructure and Rust Layer of Bridge Weathering Steels under Atmosphere Containing Cl-1: *Guiqin Fu*¹; Duo Jin¹; Xin-Liang Gao¹; Qing Li¹; Miaoyong Zhu¹; ¹Northeastern University

D34: Study on the Purification of Nickel by Vacuum Directional Solidification: Gang Wang¹; Kuixian Wei¹; *Wenhui Ma*¹; Wenzhou Yu¹; Cong Zhang¹; ¹National Engineering Laboratory for Vacuum Metallurgy; Key Laboratory for Nonferrous Vacuum Metallurgy of Yunnan Province

D35: The Effect of Cooling Intensity on the Solidification Structure and Ferrite Phase Fraction of a Duplex Stainless Steel: *Cheng Zhang*¹; Jingzheng Ye¹; Congsen Wu¹; Jincheng Hu²; Honggang Zhong¹; Qijie Zhai¹; ¹Shanghai University; ²Baoshan Iron and Steel Co Ltd

D36: The Solidification Structure and Ferrite to Austenite Transformation of a Novel Lean Duplex Stainless Steel: *Jingzheng Ye*¹; Cheng Zhang¹; Congsen Wu¹; Honggang Zhong¹; Hongmei Song¹; Xin Cao¹; Qijie Zhai¹; ¹Shanghai University

D37: The Study of Refining Mechanism of Pure Aluminum under Surface Pulsed Magneto Oscillation: *Zhichen Zhang*¹; Zhishuai Xu²; Qixin Li¹; Dong Liang¹; Qijie Zhai¹; ¹Shanghai Key Laboratory of Modern Metallurgy & Materials Processing, Shanghai University; ²College of Science, Shanghai University

D38: Thermal and Metallographic Parameters Evolution during Solidification of Zn-Sn Alloys: Wilky Desrosin¹; *Carlos Schvezov*¹; Alicia Ares¹; ¹Materials Institute of Misiones (IMAM)-Faculty of Sciences (FCEQyN-UNaM)

D39: Thermodynamic Interaction between Chromium and Phosphorus in Carbon Saturated Fe-Cr Melts: *Seok-Hyo Seo*¹; Jung-Mock Jang¹; Kyung-hyo Do¹; Jong-Jin Pak¹; ¹Hanyang University

D40: Thermodynamic Relation between Chromium and Sulfur in Fe-Cr Melts: *Kyung-Hyo Do*¹; Young-Dae Kim¹; Dong-Sic Kim¹; Jong-Jin Pak¹; ¹Hanyang University

Mechanical Behavior at the Nanoscale II — Poster Session

Sponsored by: TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania; Ting Zhu, Georgia Institute of Technology; Julia Greer, California Institute of Technology

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

Session Chairs: Evan Ma, Johns Hopkins University; Daniel Gianola, University of Pennsylvania

C44: Characterization of Transformation-induced Defects in NiTi Shape Memory Alloys: *Matthew Bowers*¹; Xiang Chen¹; Peter Anderson¹; Michael Mills¹; ¹The Ohio State University

C45: Continuum Dislocation Dynamics Modeling of Mesoscale Deformation of Single Crystals: *Shengxu Xia*¹; Anter El-Azab¹; ¹Purdue University

C46: Diameter-dependence of Elastic Properties in ZnO Nanowires: Why Do the Published Results have Conflicting Diameter Dependence?: *Zachary Trautt*¹; Lawrence Friedman¹; Robert Cook¹; Chandler Becker¹; ¹National Institute of Standards and Technology

C47: Dislocation-mediated Flaw Communication and Wavy Interface Formation in Cu/Ag Nanolayers: *Ruizhi Li*¹; Huck Beng Chew¹; ¹University of Illinois at Urbana-Champaign

C48: Effect of Sputter Pressure on Stress Evolution in Ta Thin Films during Beta-to-alpha Phase Transformation: *Elizabeth Ellis*¹; Mark Chmielus¹; Marissa Linne¹; Shefford Baker¹; ¹Cornell University

C49: Effective Attacking Length Scale of Dislocation Nucleation from the Free Surface in Pure Crystals: *Haijian Chu*¹; Y.H. Zhang²; J. Liu²; ¹Shanghai University, and State Key Laboratory for Mechanical Behavior of Materials in Xi'an Jiaotong University; ²Shanghai University

C50: Effects of Grain Size on the Martensitic Phase Transformation of Nano-polycrystalline NiAl Shape Memory Alloys: *Keith Morrison*¹; Alejandro Strachan¹; ¹Purdue University

C51: Fabrication and Characterization of Hollow Metallic Nanolattices: *Lauren Montemayor*¹; Lucas Meza¹; Julia Greer¹; ¹California Institute of Technology

C52: Towards an Understanding of the Fatigue Degradation in Nanoscale Alumina and Titania Coatings: *Farzad Sadeghi-Tohidi*¹; Eva Baumert¹; Olivier Pierron¹; ¹Georgia Institute of Technology

C53: Hydrogen Effect on the Nanomechanical Behavior of Amorphous Alloy Ribbons Having Various Zr Contents: *Yakai Zhao*¹; In-Chul Choi¹; Yong-Jae Kim¹; Jin-Yoo Suh²; Jae-il Jang¹; ¹Hanyang University; ²Korea Institute of Science and Technology

C54: Influence of Indenter Geometry on Hydrogen Effects in Nanoindentation of a Linepipe Steel: *Dong-Hyun Lee¹; Jung-A Lee¹; Moo-Young Seok¹; Un Bong Baek²; Seung Hoon Nahm²; Jae-il Jang¹;* ¹Hanyang University; ²Korea Research Institute of Standards and Science

C55: Load- and Displacement-controlled Nanoindentation of Al/a-Si Core-shell Nanostructures: *Robert Fleming¹; Min Zou¹;* ¹Department of Mechanical Engineering, University of Arkansas

C56: Mechanical Behavior of HCP-based Multilayers at Nanoscale: *Yuanyuan Lu¹; Jonathan Ligda²; Ruben Kotoka³; Baobao Cao¹; Brian Schuster²; Sergey Yarmolenko³; Qiuming Wei¹;* ¹The University of North Carolina at Charlotte; ²US Army Research Laboratory; ³NC A&T State University

C57: Mechanical Behavior of Nanocrystalline Metal in a Bulk, Thin Slab and Wire: *Hojin Kim¹; Alejandro Strachan¹;* ¹School of Materials Engineering and Birck Nanotechnology Center, Purdue University

C58: Nanoscale Creep-fatigue Behavior of Indium at Room Temperature: *Jung-A Lee¹; Yong-Jae Kim¹; In-Chul Choi¹; Ting Y. Tsui¹; Jae-il Jang¹;* ¹Hanyang University

C59: Nanoscale Creep and Its Coupled Behavior in 1-D Semiconducting Nanostructures: *Yong-Jae Kim¹; Won Woo Lee¹; In-Chul Choi¹; Won Il Park¹; Tae Gwang Yun²; Seung Min Han²; Jae-il Jang¹;* ¹Hangyang University; ²Korea Advanced Institute of Science and Technology

C60: Predicting Flow Curve of Dual-phase Steels through Nanoindentation: *Moo-Young Seok¹; In-Chul Choi¹; Yong-Jae Kim¹; Jae-il Jang¹;* ¹Hanyang University

C61: Size Effects in Nanoscale Multilayered Materials: Influence of Interface Shear Strength: *Arief Budiman¹; Youbin Kim²; J Baldwin³; Nathan Mara³; Seung-Min Han²; Amit Misra³;* ¹Singapore University of Technology & Design (SUTD); ²KAIST; ³LANL

C62: The Nanomechanical Properties of a Zn-22wt.% Al Alloy Processed by High-pressure Torsion: *In-Chul Choi¹; Yong-Jae Kim¹; Megumi Kawasaki¹; Terence G. Langdon²; Jae-il Jang¹;* ¹Hanyang University; ²University of Southern California

C63: Thermal Stability of Au-ZnO Nanocomposite: Relationship between Microstructure Evolution and Mechanical Response: *Rachel Schoeppner¹; Helena Jin²; Somuri Prasad²; David Bahr³; Neville Moody²;* ¹Washington State University; ²Sandia National Laboratories; ³Purdue University

C64: Wear and Environmental Resistance of Laser-fabricated Oxides on Steel and Ti: *Samantha Lawrence¹; David Adams²; David Bahr¹; Neville Moody²;* ¹Purdue University; ²Sandia National Laboratories

C65: Non-destructive Evaluation of Surface Residual Stress in Float Glass Using Nanoindentation: *Seung-Min Ahn¹; Seon-Young Park¹; Young-Cheon Kim¹; Kang-Sun Lee²; Ju-Young Kim¹;* ¹UNIST (Ulsan Institute of Science and Technology); ²Hyundai Motor Group

C66: In Situ EBSD Characterization of the Texture Transformation of Silver Thin Films Related to Film Thickness and Adhesion Layer: *Markus Chmielus¹; Elizabeth Ellis¹; Emily Morrow²; Ethan Ocock²; Brandon Hoffman²; Shefford Baker¹;* ¹Cornell University; ²Houghton College

C67: Indentation Size Effect in Nanoporous Gold: *Young-Cheon Kim¹; Seong-Min Ahn¹; Ju-Young Kim¹;* ¹UNIST (Ulsan National Institute of Science and Technology)

MPMD 2014 Technical Division Student Poster Contest — Posters

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Room: Sails Pavilion
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SP26: Densification Evolution during Spark Plasma Sintering of UO₂ Based on Master Sintering Curve Theory: *Zhichao Chen¹; Ghatu Subhash¹; James Tulenko²; Ronald Baney²;* ¹Mechanical & Aerospace Engineering, University of Florida; ²Materials Science & Engineering, University of Florida

SP27: Abnormal Grain Growth-Identifying Onset Conditions via 3D Monte Carlo Modeling: *Catherine Sahi¹; Steven Chiu¹; Veena Tikare²; Robert DeHoff¹; Burton Patterson¹;* ¹University of Florida; ²Sandia National Laboratories

SP28: Experimental Investigation of the Effects of Alloying Elements on Coupled Growth in Fe-C Eutectic: *Elis Rivera¹; Amber Genau¹;* ¹University of Alabama at Birmingham

SP29: Improvement on the Corrosion Behaviour and Contact Resistance of CoBlast Deposited Graphite/Alumina Coatings by Pack Cementation: *Atinuke Oladoye¹; James Carton¹; Abdul Olabi²;* ¹Dublin City University; ²School of Engineering, University of West Scotland

SP30: Determination of Grain Level Strain and Deformed Lattice Parameters Using Far Field High-energy Monochromatic X-ray Diffraction: *Kamalika Chatterjee¹; Jonathan Lind²; Armand Beaudoin¹; Peter Kenesei³; Jun-Sang Park³; Robert Suter²;* ¹University of Illinois at Urbana-Champaign; ²Carnegie Mellon University; ³Argonne National Laboratory

SP31: In Vitro Biocompatibility and Antibacterial Studies of TiSiN Nanocomposite Coating on Ti₆Al₄V Orthopedic Alloy, Deposited by Sputtering Process: *Pramanshu Trivedi¹; Pallavi Gupta¹; Swati Srivastav¹; R Jayaganthan¹; R Jayaganthan¹;* ¹Indian Institute of Technology Roorkee India

SP32: Laser Processing of Soft Magnetic Amorphous Ribbons: Multimodal Characterization and Magnetic Study: *Shravana Katakam¹; Arun Devaraj²; Mark Bowden²; Rajarshi Banerjee¹; Suntharampillai Thevuthasan²; Narendra Dahotre¹;* ¹University of North Texas; ²Pacific Northwest National Laboratory

SP33: Mechanism of Ag Precipitates Formation in Cu-7wt%Ag-0.05wt%Zr Alloy: *Waraporn Piyawit¹; Weizong Xu¹; Suveen Mathaudhu; Jens Freudenberger²; Mike Rigsbee¹; Yuntian Zhu¹;* ¹North Carolina State University; ²IFW Dresden

SP34: Modeling of Failure Risk in Hot Forging of Ti-6Al-4V Containing Hard Alpha Anomaly: *Rohit Subramanian¹; Shlok Sundaresh¹;* ¹The Ohio State University

SP35: Monte-Carlo Potts Model for Twin Formation during Microstructure Evolution: *Brian Lin¹; Gregory Rohrer¹; Anthony Rollett¹;* ¹Carnegie Mellon University

SP36: Structural Disjoining Potential of Grain Boundary Premelting via Monte Carlo Simulation: *Tara Power¹; Jeffrey Hoyt¹;* ¹McMaster University

SP37: Numerical Modelling of Evaporation of Water in Tape Casting: Coupled Thermal and Mass Diffusion: *Masoud Jabbari¹; Jesper Hattel¹;* ¹Technical University of Denmark

SP38: Structure Characterization on Micro-sized Single Particle Treated by In Situ Ultrafast Scanning Nanocalorimetry: *Bingge Zhao¹; Linfang Li¹; Qijie Zhai¹; Yulai Gao¹;* ¹Shanghai University

SP39: A Molecular Dynamics Study of Anomalously Fast Diffusion of Cu in Pb: *Mary Gallerneault¹; Jeffrey J. Hoyt¹;* ¹McMaster University

SP40: Recycling of Tungsten Copper Scrap to form Tungsten Carbide Powder: *Alysha Hudson¹; Rhys Palmer¹; Charles Williams¹; Amaninder Brar¹;* ¹University of Alberta

SP41: Characterizing the Variation of Surface Charge Density of Natural Fibers by High-Resolution Force Spectroscopy: *Eric Cabbage¹; T. Moses²; E. Stein³; S. Breakiron³; M. Ellison³; D. Dean²; M. Kennedy⁴;* ¹Material Advantage Clemson University Chapter; ²Department of Bioengineering, Clemson University; ³Department of Materials Science and Engineering, Clemson University; ⁴Department of Materials Science and Engineering, Clemson University

SP42: Investigation of Fracture in NiTi Dental Files: *Matthew Wheeler¹; Rahnuma Chowdhury¹;* ¹Ohio State University

SP43: Predicting Metastatic Potential In Vitro for Personalized Cancer Treatment: *Megan Malara¹; Jackson Thomas¹; Qiuwan Wang¹; Heather Powell¹;* ¹The Ohio State University



SP44: Three Dimensional Analysis of Eutectic Dendrites in Al-Ag-Cu Alloy by Serial Sectioning: *Benjamin Graham*¹; Amber Genau¹; ¹University of Alabama at Birmingham

MPMD 2014 Technical Division Young Professional Poster Contest — Posters

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YP11: Reactive Spark Plasma Sintering of TiB₂-CNT Ultra-high Temperature Ceramic Composites: *Srinivasa Bakshi*¹; Karthiselva S¹; ¹Indian Institute of Technology Madras

YP12: Fretting-corrosion Behavior of Mixed Metal Contacts (Ti₆Al₄V-CoCrMo) in a Hip Modular/Taper Junction: *Mathew Mathew*¹; Maria Runa¹; Dmitry Royhman¹; ¹Rush University

YP13: Process Optimization to Engineer Interface for Tailoring Thermal Transport in Copper/Diamond System: *Vikas Sinha*¹; J.J. Gengler¹; C. Muratore¹; J.E. Spowart¹; ¹Air Force Research Laboratory, Materials and Manufacturing Directorate, Wright-Patterson Air Force Base

Multiscale Perspectives on Plasticity in HCP Metals — Poster Session

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

Program Organizers: Benjamin Morrow, Los Alamos National Laboratory; Suveen Mathaudhu; Ellen Cerreta, Los Alamos National Laboratory; Juan P. Escobedo, The University of New South Wales Canberra; Dallas Trinkle, University of Illinois, Urbana-Champaign

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B42: Measuring the Critical Resolved Shear Stresses in Mg Alloys by Instrumented Nanoindentation: *Jon Molina-Aldareguia*¹; Raul Sánchez¹; Teresa Pérez-Prado¹; Javier Segurado¹; Javier Llorca¹; ¹IMDEA Materials Institute

B43: New Interpretation of Monotonic Swift Effects in Anisotropic Materials: *Benoît Revil Baudard*¹; Oana Cazacu¹; Nitin Chandola¹; ¹University of Florida

Nanoparticulate Materials: Production, Consolidation and Characterization — Poster Session

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

Program Organizers: Brady Butler, U.S. Army Research Laboratory; Eugene Olevsky, San Diego State University

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Session Chair: Brady Butler, US Army Research Lab

K30: Consolidation of Perspective Refractory Nuclear Ceramics by Field-assisted Methods: *Maria Yurlova*¹; Evgeny Grigoryev¹; Eugene Olevsky²; D Shornikov¹; B Tarasov¹; C Nikitin¹; ¹MEPHI; ²NRNU MEPhI, SDSU

K31: Effect of Oxide Dispersion Strengthening on Spark Plasma Sintering Kinetics of 13Cr-2Mo Ferritic/Martensitic Steels: *Igor Bogachev*¹; Ivan Chernov¹; Eugene Olevsky²; ¹Moscow Engineering Physics University; ²San Diego State University

K32: Green Synthesis of Silver Nanoparticles Using Arbutus cf. Bicolor Leaves Extract: *Laura García Hernández*¹; Diana Arenas Islas¹; Pedro Ramirez Ortega¹; Mizrraim Flores Guerrero¹; Luis García Lechuga¹; ¹Universidad Tecnológica de Tulancingo

K33: Technologies of Synthesis of Micro and Nanoparticles of Metal Oxides (Nitrides) for the Modification of Properties of Aluminum-magnesium Light-weight Alloys: *Sergey Bondarchuk*¹; *Alexander Zhukov*¹; *Alexander Vorozhtsov*¹; *Ilya Zhukov*¹; *Wim Sillekens*²; *David Jarvis*²; ¹Tomsk State University; ²European Space Agency (ESA)/ESTEC

K34: Analysis of MMM Junction Device and Effective Method of Reduce the Electrical Shorts: *HoJong Chang*¹; *Eung-Hwi Kim*¹; *Sang-Hyun Park*¹; ¹KAIST

Neutron and X-ray Studies of Advanced Materials VIII: Challenges of the Future World — Poster Session

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

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Gernot Kosterz, ETH; Brent Fultz, California Institute of Technology; Peter Liaw, The University of Tennessee

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C68: Anomalous Small-angle Scattering with Soft X-rays at Al and Si K Absorption Edges: *Hiroshi Okuda*¹; Ryo Shirai¹; Takayoshi Yamamoto¹; Yuki Nishizawa¹; Yoshinori Kitajima²; ¹Kyoto University; ²Photon Factory KEK

C69: In Situ Neutron Diffraction and Crystal Plasticity Modeling of a-Uranium: *Christopher Calhoun*¹; Sean Agnew¹; Jonathan Morrell²; Elena Garlea²; ¹University of Virginia; ²Y-12 Security Complex

C70: Interpretation of Temperature Dependent Tensile Behavior of 304ss by In Situ Neutron Diffraction under Continuous Loading Mode: *Dunji Yu*¹; Hong Gao¹; Ke An²; Xu Chen¹; ¹Tianjin University; ²Oak Ridge National Laboratory

C71: Investigation on Creep Deformation of Ferritic Superalloys with a New Hierarchical Structure Using In Situ Neutron Diffraction: *Gian Song*¹; Zhiqian Sun¹; Gongyao Wang¹; Hong Ding²; Christian Liebscher²; Mark Asta²; Gautam Ghosh³; David Dunand³; Michael Rawling³; Nhon Vo³; Peter Liaw¹; ¹University of Tennessee; ²University of California, Berkeley; ³Northwestern University, Evanston

C72: Phase Contrast Microscopy with a Polychromatic X-ray Source: *Amy Wang*¹; Bart Pauwels²; Marc De Graef¹; Dirk Van Dyck³; ¹Carnegie Mellon University; ²Bruker microCT; ³University of Antwerp

C73: SANS Study of Highly Irradiated RPV Steels: *Mikhail Sokolov*¹; Randy Nanstad¹; Grant Williams²; ¹ORNL; ²UTK

C74: Temperature Dependent Intergranular Stresses during Constrained Continuous Heating and Cooling Cycles in a High Strength Quenched and Tempered Structural Steel: *R. Dutta*¹; R. Huizenga²; M. Amirthalangam²; H. Gao¹; A. King³; M. Hermans²; I. Richardson²; ¹Materials Innovation Institute; ²Delft University of Technology; ³French National Synchrotron Facility

C75: Refractive and Diffractive Neutron Optics with Reduced Chromatic Aberration: *Stefan Poulsen*¹; Henning Poulsen¹; ¹Technical University of Denmark

C76: Reconstruction of Intensity from Contained Samples: *Thomas Watkins*¹; R. Barabash¹; R. Meisner¹; T. Burchell¹; T. Rosseel¹; ¹ORNL

C77: Understanding Semi-solid Mechanics in Al-Cu Using 4D In Situ Synchrotron-based X-ray Tomographic Microscopy: *Biao Cai*¹; Shyamprasad Karagadde¹; Peter Lee¹; Julie Fife²; Thomas Connolly³; ¹Manchester X-Ray Imaging Facility, School of Materials, University of Manchester; ²Swiss Light Source, Paul Scherrer Institut; ³Diamond Light Source Ltd, Harwell Science & Innovation Campus

Pb-free Solders and Emerging Interconnect and Packaging Materials — Poster Session

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Andre Lee, Michigan State University; Fay Hua, Intel Corporation; Tae-Kyu Lee, Cisco; John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation; Robert Kao, National Taiwan University; Fan-yi Ouyang, National Tsing Hua University; Chang-Woo Lee, Korea Institute of Industrial Technology; Won Sik Hong, Korea Electronics Technology Institute; Heugel Werner, Bosch Automotive

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Session Chairs: John Elmer, Lawrence Livermore National Laboratory; Yan Li, Intel Corporation

B44: Development of Pb and Ag Free Solder Alloys: *Serkan Yilmaz*¹; Eren Kalay¹; ¹METU

B45: Elasticity and Residual Stresses of Sintered Ag for Die Bonding Studied by Dynamic Resonant Method: *Vincenzo Caccuri*¹; Pascal Gadaud¹; Xavier Milhet¹; Denis Bertheau¹; Michel Gerland¹; ¹Institut Pprime UPR CNRS 3346

B46: Impact of Co-P Surface Finish on Shear Strength of Sn-Ag-Cu Solder Interconnects in Ball Grid Array Packages under Thermal Cycling: Donghua Yang¹; Jian Cai¹; Qian Wang¹; Jingwei Li¹; Yang Hu¹; *Liangliang Li*¹; ¹Tsinghua University

B47: Physicochemical Properties of Sb-Sn-Zn Alloys: *Tomasz Gancarz*¹; ¹Institute of Metallurgy and Material Science PAS

B48: Recent Development of Nanowire-based Pb-free Nanosolders for Nanoelectronics Assembly and Interconnection: *Fan Gao*¹; Zhiyong Gu¹; ¹University of Massachusetts Lowell

B49: Synthesis and Applications of Low Melting Point Tin/Indium (Sn/In) Lead-free Nanosolders: *Yang Shu*¹; Fan Gao¹; zhiyong Gu¹; ¹University of Massachusetts Lowell

B50: Synthesis of High-temperature Lead-free Nanosolders and Their Electronics Applications: *Evan Wernicki*¹; Zhiyong Gu¹; ¹University of Massachusetts Lowell

B51: Synthesis of Lead-free Nanosolders Using Microfluidic Devices: *Zhiyang Li*¹; Yang Shu¹; Zhiyong Gu¹; ¹University of Massachusetts Lowell

B52: Wetting of Cu Pads by Liquid Bi-Ag-Cu Alloys: *Przemyslaw Fima*¹; Anna Sypien¹; ¹Institute of Metallurgy and Materials Science, Polish Academy of Sciences

B53: Processing of a Package-on-package and Characterization of Its Warpage: *Dong-Myung Jung*¹; Jung-Yeol Choi¹; Min-Young Kim¹; Tae-Sung Oh¹; ¹Hongik University

B54: Transient Liquid Phase Sintering for Power Electronics: *John Holaday*¹; Carol Handwerker¹; ¹Purdue University

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XIII — Poster Session

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Chao-hong Wang, National Chung Cheng University; Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikuo Ohnuma, Tohoku University; Clemens Schmetterer, Forschungszentrum Juelich, Inst.; Yee-Wen Yen, National Chung Cheng University; Shien Ping Feng, The University of Hong Kong; Shih-Kang Lin, National Cheng Kung University

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M2: Effect of Crystallographic Direction on the Sintering of ThO₂ Nanoparticles: *Wan-Chin Chao*¹; Wen-Dung Hsu¹; ¹National Cheng Kung University

M3: Effect of Bump Height on Electromigration Failure Mode in Sn_{2.3}Ag Solder Joints with Cu and Ni Metallization: *Shun Cai Liu*¹; Chih Chen¹; ¹National Chiao Tung University

M4: Effective Suppression of Sn-58Bi/Cu Interfacial Reactions with Minor Ga Addition: *Trong Lan Nguyen*¹; Shih-kang Lin²; ¹Department of Materials and Engineering, National Cheng Kung University; ²Department of Materials Science and Engineering-Promotion Center for Global Materials Research-Center for Micro/Nano Science and Technology, National Cheng Kung University

M5: Solid-state Reactions by Surface and Bulk Diffusion between Sn-based Solder and Ag Substrate: *Beom-Yong Lee*¹; Joo-Youl Huh¹; ¹Korea University

M6: Crystallization and Damage Evolution of Nickel-phosphorus Films on Glass Wafer during Mechanical and Thermal Fatigue: *Yong Jun Oh*¹; Jong Geun Park¹; Seung Sik Jang¹; ¹Hanbat University

Phase Transformation and Microstructural Evolution — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Amy Clarke, Los Alamos National Laboratory; Sudarsanam Suresh Babu, The Ohio State University; Ning Ma, ExxonMobile Research & Engineering; Tadashi Furuhashi, Tohoku University; Frédéric Danoix, Université de Rouen; Mohamed Gouné, University of Bordeaux; Francisca Caballero, National Center for Metallurgical Research (CENIM-CSIC); Dhriti Bhattacharyya, Australian Nuclear Science & Technology Organization; Vijay Vasudevan, University of Cincinnati; Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory; Chad Sinclair, University of British Columbia

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M7: Phase Growth in Fe-Fe50wt%Si Diffusion Couple under a Magnetic Field: *Fan Lijun*¹; Zhong Yunbo¹; Zhou Pengwei¹; Zheng Tianxiang¹; Long Qiong¹; ¹Shanghai University

M8: Determination of Tensile Strength, Impact Strength, Hardness and Microstructures of Mild Carbon Steel Quenched in Coconut Water, Fresh Urine, Nigerian Unadulterated Up-wine, Fermented Cassava Water, Ogiri-Ugba Water and Specially Prepared Clay Soil: *Tobechukwu Ayogu*¹; ¹University of Nigeria, Nsukka

M9: Nucleation and Growth of Nucleus in Supercooled Liquid Fe: A Molecular Dynamics Study: *Rong Li*¹; Yongquan Wu¹; ¹Shanghai University



M10: Obtaining a Bimodal Grain Size Distribution via Thermal Means: David Wu¹; Muhammad Huzaifah¹; Siu Sin Quek¹; ¹Institute of High Performance Computing, A*STAR

M11: Substructure and Texture Evolution Effects in Understanding Mechanical Property Anisotropy in High Strength Microalloyed Steels: Pavan Challa Venkata Surya¹; Devesh Misra¹; Murali Manohar²; Michael Mulholland³; Jack Hartmann³; ¹University of Louisiana at Lafayette; ²ArcelorMittal; ³ArcelorMittal

M12: Effects of Cooling Rate On the Microstructure and Solute Partitioning in Hipereutectoid Ti-Cu Alloys: Rodrigo Contieri¹; Eder Lopes²; Soumya Nag¹; Rubens Caram²; Raj Banerjee¹; ¹University of North Texas / Center for Advanced Research and Technology and Department of Materials Science and Engineering; ²School of Mechanical Engineering / University of Campinas

Progress Towards Rational Materials Design in the Three Decades Since the Invention of the Embedded Atom Method: An MPMD Symposium in Honor of Dr. Michael I Baskes — Poster Session

Sponsored by: TMS Materials Processing and Manufacturing Division, TMS; Nanomechanical Materials Behavior Committee

Program Organizers: Srinivasan Srivilliputhur, University of North Texas; Amit Misra, Los Alamos National Laboratory; Neville Moody, Sandia National Laboratories; Stephen Foiles, Sandia National Laboratories; Mark Asta, University of California; Alan Needleman, University of North Texas

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F47: Atomistic Separation and Ordering at Equilibrium in High Temperature U-Zr Alloys: Alex Moore¹; Michael Baskes²; Ben Beeler¹; Maria Okuniewski³; Chaitanya Deo¹; ¹Georgia Institute of Technology; ²Los Alamos National Laboratory; ³Idaho National Laboratory

F48: Deformation Debris and Their Contribution to Hindering Dislocations - Atomistic Simulations in Aluminum: Hao Wang¹; Dongsheng Xu¹; Rui Yang¹; ¹Institute of Metal Research, Chinese Academy of Sciences

F49: Effect of the Berkovich Indenter Orientation on the Dislocation Nucleation Stresses Estimated from Nanoindentation: Li Ma¹; Ron Dixon¹; Francesca Tavazza¹; Yvaonne Gerbig¹; Douglas Smith¹; Lyle Levine¹; ¹NIST

F50: Grain Size Dependent Mechanical Behavior and Deformation Mechanism in Nanocrystalline Copper: Xing Zhao¹; Cheng Lu¹; A.K. Tieu¹; Linqing Pei¹; Lihua Zhan²; Minghui Huang²; ¹University of Wollongong; ²State Key Lab of High-performance Complex Manufacturing, Central South University

F51: Interatomic Potential Model that Covers Metallic, Covalent and Ionic Materials: 2NN MEAM + Qeq: Eunkoo Lee¹; Byeong-Joo Lee¹; ¹POSTECH

F52: Strongly Anharmonic Phonon Dynamics of Cuprite Ag₂O Studied by Inelastic Neutron Scattering and First Principles Molecular Dynamics Simulations: Tian Lan¹; Chen Li; J Niedziela²; Hillary Smith; D Abernathy²; G Rossman¹; Brent Fultz; ¹California Institute of Technology; ²Oak Ridge National Laboratory

Rare Metal Extraction & Processing Symposium — Poster Session

Sponsored by: Associação Brasileira de Metalurgia, Materiais e Mineração – ABM, Chinese Society for Metals, Metallurgy and Materials Society of CIM, Institute of Materials, Minerals and Mining, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Neale Neelameggham, Ind LLC; Shafiq Alam, Memorial University of Newfoundland; Harald Oosterhof, Umicore; Animesh Jha, University of Leeds; Shijie Wang, Rio Tinto, Kennecott Utah Copper Refinery

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H3: Recovery of Tungsten from Waste Machining Alloy Scrap: Rahul Kumar¹; ¹National Institute of Technology, Jamshedpur

H4: Matrix Studies and Solvent Extraction of Zirconium and Hafnium: Kilambi Sahira¹; ¹National Institute of Technology, Warangal

H5: Bioreductive Recovery of Platinum Group Metals by the Metal-ion Reducing Bacterium Shewanella Algae: Norizo Saitoh¹; Rie Tanaka¹; Shingo Maeda¹; Toshiyuki Nomura¹; Yasuhiro Konishi¹; ¹Osaka Prefecture University

H6: Recovery of Tellurium from Silver Separating Residue Produced In Copper Smelter: Zhonglin Ye¹; Yifeng Shi¹; ¹Recovery of Tellurium from Silver Separating Residue Produced In Copper Smelter

H7: Thermodynamics of Carbon in Fe-V-Ni-Mo Alloy Melts: Do-Hyeong Kim¹; Tae-Jung Kim¹; Seung-Yeon Won¹; Min-Kyu Paek¹; Jong-Jin Pak¹; ¹Hanyang University

H8: Dysprosium Extraction Using Molten Salt Electrolysis Process: Aida Abbasalizadeh¹; Lidong Teng¹; Seshadri Seetharaman¹; ¹Royal Institute of Technology

H9: Recovery of Rare Earth Metals (REMs) from Phosphor Powder of Fluorescent Lamp: Amrita Kumari Jha¹; Rekha Panda¹; Archana Kumari¹; Rina Sahu²; ¹CSIR-National Metallurgical Laboratory; ²National Institute of Technology, Jamshedpur, India.

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SP45: A Novel Route to Process Ni-20Cr Based Alloys for High Temperature Applications: Somayeh Pasebani¹; Aniket Dutt²; Indrajit Charit¹; Rajiv Mishra²; ¹University of Idaho; ²University of North Texas,

SP46: A Study of the Microstructure and Crystallographic Texture Evolution in the Fe-30.5Mn-8.0Al-1.2C And Fe-30.5Mn-2.1Al-1.2C Steels Upon Cold Rolling: Fabricio Souza¹; Ivan Gutierrez-Urrutia¹; Dierk Raabe¹; Angelo Padilha²; ¹Max-Planck-Institut für Eisenforschung; ²University of São Paulo

SP47: Alloying and Heat-Treatment Effects on Microstructures and Mechanical Behavior of High-Entropy Alloys Systems: Zhi Tang¹; Oleg Senkov²; Chad Parish³; Daniel Miracle²; Chuan Zhang⁴; Fan Zhang⁴; Michael Gao⁵; Peter Liaw¹; Takeshi Egami¹; ¹The University of Tennessee; ²Air Force Research Laboratory; ³Oak Ridge National Laboratory; ⁴CompuTherm LLC; ⁵National Energy Technology Laboratory

SP48: A Framework for Quantifying Errors in Digital Representations of Microstructure: Gregory Loughnane¹; Michael Groeber²; Michael Uchic²; Ramana Grandhi¹; ¹Wright State University; ²Air Force Research Laboratory

SP49: Effect of Nitrogen, Nickel and Carbon on Stress Corrosion Cracking Susceptibility of Austenitic Fe₁₈Cr₁₀Mn Steels: Youngsub Yoon¹; Heon-young Ha²; Tae-Ho Lee²; Sangshik Kim¹; ¹Gyeongsang National University; ²Korea Institute of Materials Science

SP50: Fatigue Properties of LIGA Ni Thin Films: *Farzad Sadeghi-Tohidi*¹; Olivier Pierron¹; ¹Georgia Institute of Technology

SP51: Creep Behavior of Chitin-carbon Nanotube Composites: *Sujeily Soto*¹; O. Marcelo Suarez²; Jose Salcedo¹; ¹University of Puerto Rico

SP52: Comparison of Solute Additions for Stabilization of Nano-sized Grains in Melt-Spun Aluminum: *Andrew Baker*¹; Paul Sanders¹; Stephen Kampe¹; ¹Michigan Technological University

SP53: Recovering Compressive Plasticity of Bulk Metallic Glasses by High Temperature Creep: *Yang Tong*¹; ¹The University of Tennessee-Knoxville

SP54: The Mechanical Property of Cuttlebone Under Hydrostatic Pressure: *Ming-Han Chou*¹; Yao-Tein Ku¹; Yueh-Ying Chou¹; Wen-Guang Liu¹; Tzay-Ming Hong¹; Chuan-Chin Chiao¹; Po-Yu Chen¹; ¹National Tsing Hua University

SP55: The Coarsening Behavior of NiAl Precipitates in NiAl-strengthened Ferritic Steels at 973, 1073, and 1223 K: *Zhiqian Sun*¹; Jan Ilavsky²; Gian Song¹; Gongyao Wang¹; Peter Liaw¹; ¹The University of Tennessee; ²Argonne National Laboratory

SP56: Processing, Microstructure Characterization, and Biological Response of Hierarchical Surface Coatings for Titanium Implants: *Courtney Gegg*¹; Grant Crawford²; ¹University of California, Davis; ²South Dakota School of Mines and Technology

SP57: Honeycomb Materials for Improved Automobile Crashworthiness: *Connor Stone*¹; Kit James¹; You Li¹; Peter Anderson¹; ¹The Ohio State University

SP58: Hydrogels for Stem Cell-Based Heart Muscle Regeneration: *Eduardo Calzadilla-Kolodziej*¹; ¹The Ohio State University

SP59: Building Block Approach to the Development of an AlCuMnNi High Entropy Alloy: *Aarthi Sridhar*¹; Cody Crosby¹; Kevin Laws²; Michael Ferry²; Lori Bassman¹; ¹Harvey Mudd College; ²University of New South Wales

SMD 2014 Technical Division Young Professional Poster Contest — Posters

Sponsored by: TMS Structural Materials Division, TMS: Young Professionals Committee

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

YP14: Deformation Debris and Their Contribution to Affecting Metal Properties: Atomistic Simulations in Aluminum: *Hao Wang*¹; Dongsheng Xu¹; Rui Yang¹; ¹Institute of Metal Research, Chinese Academy of Sciences

YP15: An Equivalent von Neumann-Mullins-relation for Nanocrystalline Grain Growth: *Dana Zoellner*¹; Peter Streitenberger¹; Paulo Rios²; ¹Otto von Guericke University Magdeburg; ²Universidade Federal Fluminense

YP16: Enhancing Fracture Toughness Using Elasto-Geometric Heterogeneity: *Md. Hossain*¹; Guruswami Ravichandran¹; Kaushik Bhattacharya¹; ¹California Institute of Technology

YP17: Stabilization of the Tetragonal and Cubic Phases of Hafnium Dioxide by Laser Ablation: *Viktor Panfilov*¹; Maxim Pugachevskii²; ¹Far Eastern State Transport University; ²Institute for Material Science of Far Eastern Branch of Russian Academy of Sciences

YP18: A Nanofiber/Hydrogel Composite Structure Mimicking Connective Tissues: *Young Hun Jeong*¹; Jinah Jang²; Dong-Woo Cho²; ¹Korea Polytechnic University; ²POSTECH

YP19: Micro-architected Ni-based Superalloys: *Dinc Erdeniz*¹; Keith Sharp²; David Dunand¹; ¹Northwestern University; ²3TEX Incorporated

YP20: Structure and Properties of the Y₂O₃/Fe Interface from First Principles Calculations: *Samrat Choudhury*¹; Christopher Stanek¹; Blas Uberuaga¹; ¹Los Alamos National Laboratory

YP21: Accident-Tolerant Fuel Cladding Materials for Advanced Light Water Reactors: *Indrajit Charit*¹; Maxwell Bowdon¹; Somayeh Pasebani¹; Sultan Alsagabi¹; ¹University of Idaho

YP22: Grain Boundary Character Evolution of Nickel 200: *Olivia Underwood*¹; Jeff Evans¹; ¹University of Alabama in Huntsville

Solid-state Interfaces III: Toward an Atomistic-scale Understanding of Structure, Properties, and Behavior through Theory and Experiment — Poster Session

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee
Program Organizers: Xiang-Yang Liu, Los Alamos National Laboratory; Blas Uberuaga, Los Alamos National Laboratory; Stephen Foiles, Sandia National Laboratories; Mitra Taheri, Drexel University; Rampi Ramprasad, University of Connecticut

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

B55: Charge Transfer Molecular Dynamics Simulations on Ni Vacancy Behavior at Ni/NiO Semi-coherent Interfaces: *Shotaro Hara*¹; Satoshi Izumi¹; Shinsuke Sakai¹; ¹The University of Tokyo

B56: Workfunction Tuning of Zinc Oxide Based Thin Films for Device Applications: *Reinaldo Santos-Ortiz*¹; Jitendra Jha¹; ¹University of North Texas

B57: In Situ Analysis of the Sensitization of Grain Boundary Engineered 316 Stainless Steel: *Matthew Hartshorne*¹; Christopher Barr¹; Mitra Taheri¹; ¹Drexel University

TMS2014 General Poster Session — Poster Session

Sponsored by: TMS Electronic, Magnetic, and Photonic Materials Division, TMS Extraction and Processing Division, TMS Light Metals Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

A1: A Study on the Characteristics of Materials for Railway Vehicles: *Sung Cheol Yoon*¹; Joon Hyung Ryu¹; Young Guk Kim¹; ¹Korea Railroad Research Institute

A2: A Study on the Mechanical Properties Variation of the AM60B with MgO-CNT: *Min Seok Moon*¹; Myeong Han Yoo¹; Shin Jae Kang²; Joon Hyuk Song¹; Je Ha Oh¹; ¹Korea Institute of Carbon Convergence Technology; ²Chonbuk National University

A3: Determination of the Optimum NiS Fire Assay Parameters for Platinum in Catalytic Converters: *Mehmet Hakan Morcali*¹; Suleyman Akman¹; Onuralp Yucel¹; ¹Istanbul Technical University

A4: Comprehensive Mathematical Model of Thermal Process In RHF for Direct Reduction: *Xue-feng She*¹; Jing-song Wang¹; Jin-zhou Liu¹; Yu-liang Wu¹; Qing-guo Xue¹; Xin-xin Zhang¹; ¹University of Science and Technology Beijing

A5: Dynamic Mechanical Behavior and Phase-based Constitutive Model of 20Cr₁₂Ni₄Mo₃VNiN in High Temperature: *Zhenguo Nie*¹; Gang Wang¹; JianChao Yu¹; Yiming(Kevim) Rong¹; ¹Tsinghua University

A6: Behavior of Particles in the Liquid-particle Mixture during Solidification: *Myung-Jin Suk*¹; Gyu-Hee Lee¹; Ho-Suk Lee¹; Young Do Kim²; Sung-Tag Oh³; ¹Kangwon National University; ²Hanyang University; ³Seoul National University of Science and Technology



- A7: Development of Cylindrical Carbon Composite Components Using Braiding Process:** *Woong Ki*¹; Hyun-kyu Shin¹; ¹Korea Institute of Carbon Convergence Technology
- A8: Development of Mg Seat Frame for Commercial Bus by High Pressure Die-casting Process:** *Min Seok Moon*¹; Myung Han Yoo¹; Joon Hyuk Song¹; Je Ha Oh¹; Shin Jea Kang²; Sang Youp Oh¹; ¹Korea Institute of Carbon Convergence Technology; ²Chonbuk National University
- A9: Consolidation of TiB₂ Ceramics by Using Spark Plasma Sintering:** *Ahmet Turan*¹; Filiz Cinar Sahin¹; Gultekin Goller¹; Onuralp Yucel¹; ¹Istanbul Technical University
- A10: Corrosion Analysis of Zn -Sn Alloys:** Veronica Scheiber¹; Claudia Méndez¹; *Carlos Schvezov*¹; Alicia Ares¹; ¹Materials Institute of Misiones (IMAM)-Faculty of Sciences (FCEQyN-UNaM)
- A11: Fabrication of Conductive Metallic Circuits on Paper by Printing Ag Nanowire Composite and Irradiation of Intense-pulsed Light:** *Jong-Woong Kim*¹; Ki-Hoon Ok¹; Chan-Jae Lee¹; Chul-Jong Han¹; Min-Gi Kwak¹; ¹Korea Electronics Technology Institute
- A12: Effect of Nitrogen, Nickel and Carbon on Stress Corrosion Cracking Susceptibility of Austenitic Fe18Cr10Mn Steels:** *Youngsub Yoon*¹; Heonyoung Ha²; Tae-ho Lee²; Sangshik Kim¹; ¹Gyeongsang National University; ²Korea Institute of Materials Science
- A13: Effect of Heat Treatment on Mechanical Properties of Zn-Mg Alloys:** *Jong Min Byun*¹; Seong Yeul Kwak¹; Tae Yeob Kim²; Woo Sung Jung²; Young Do Kim¹; ¹Hanyang University; ²POSCO
- A14: Effect of Pre-strain on Creep Properties and Precipitation Behavior of Cu Added Alumina-forming Austenitic Stainless Steel:** *Min-Ho Jang*¹; Joonoh Moon²; Jun-Yun Kang²; Tae-Ho Lee¹; ¹University of Science and Technology; ²Korea Institute of Materials Science
- A15: Enhancing Open Circuit Voltage by Combining Thermoelectric Materials and Dye-sensitized Solar Cell in Series:** *Hsuan Lee*¹; Chih-Ming Chen²; ¹National Chung-Hsing University; ²National Chung-Hsing University
- A16: Effect on Transport-current Characteristics of Thickness Stabilization Layer with Different Properties of YBCO Thin-film Wire Deposited by Thermal Evaporation Method:** *Ho Ik Du*¹; Soung Ouk Heo¹; Tae Min Kim¹; Byoung Sung Han¹; Byoung Jung Choi¹; Byung Yoon Chul¹; Sung Chae Yang¹; ¹Chonbuk National University
- A17: Electrochemical Forming of Porous Cu-Sn Alloy Electrode Materials for Li-ion Batteries:** *Sunjung Kim*¹; Bora Ye¹; Binh Ha Bui¹; ¹University of Ulsan
- A18: Effect of Sn Microstructure and Tensile Properties of Hot-rolled Mg-Zn Sheet:** *Seung Won Kang*¹; Heon Kang¹; Donghyun Bae¹; ¹Yonsei university
- A19: Effects of Heat Treatment on the Fatigue Deformation Behavior of Modified 7075 Aluminum Alloy:** *Kee-Ahn Lee*¹; Gwan-Yeong Kim¹; Shae Kwang Kim²; Young-Ok Yoon²; Si-Young Sung³; Bum-Suck Han³; ¹Andong National University; ²Korea Institute of Industrial Technology; ³Korea Automotive Technology Institute
- A20: Enhanced Thermoelectric Properties of p-Type Bi_{0.4}Sb_{1.6}Te₃ by Adjustment of Micro- and Nanograin Bi_{0.4}Sb_{1.6}Te₃ Powder Ratio:** *Pee-Yew Lee*¹; *Tzu-Chien Chen*¹; ¹National Taiwan Ocean University
- A21: Evaluation of Role of Be Minor Addition on Glass-forming Behaviour of Zr-Cu-Al-Ag BMG-forming Alloys by Electrostatic Levitation:** *Chae Woo Ryu*¹; Eun Soo Park¹; Dong Hee Kang¹; Geun Woo Lee²; Takehiko Ishikawa³; Junpei Okada³; ¹Seoul National University; ²Korea Research Institute of Standards and Science; ³Japan Aerospace Exploration Agency
- A22: Estimation of Compressive Strength of High Strength Concrete with Recycled Coarse Aggregate Using Ultrasonic Pulse Velocity Method:** *Seonguk Hong*¹; Seunghun Kim¹; Yongtaeg Lee¹; ¹Hanbat National University
- A23: Flow Phenomena in an Extra Wide CSP-mold-experimental Investigations:** *Rüdiger Bahrman*¹; Antje Rückert¹; *Herbert Pfeifer*¹; ¹RWTH-Aachen University
- A24: Extension of the Classical Thermodynamic/Kinetic Model to Predict Strain Induced Precipitation in an Ultrafine-grained Al-Cu-Sc Alloy:** *Long Jiang*¹; Gang Liu¹; Jun Sun¹; Peng Zhang¹; ¹State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University
- A25: Ion-induced Swelling of Yttrium Oxide-dispersion-strengthened 0Cr₁₈Ni₁₀Ti Steel:** *Victor Bryk*¹; Victor Voyevodin¹; Oleg Borodin¹; Valeriy Ageev²; Alyeksandr Kalchenko¹; Aleksandra Nikitina²; ¹Kharkov Institute of Physics and Technology; ²High-Technology Research Institute of Inorganic Materials
- A26: Leaching of High Carbon Ferromanganese in Acidic Medium:** Erdem Kilicarslan¹; *Selim Ertürk*¹; Cunevt Arslan¹; ¹Istanbul Technical University
- A27: Interfacial Reactions between Ag-added Cu Substrate and Sn Solder:** *Chih-Ming Chen*¹; Teng-Kai Yang¹; Chi-Fan Lin¹; ¹National Chung Hsing University
- A28: Investigation on the Activation Energy of ZnO Thin-film Transistors with Hf and Sn Doping:** Dong-Suk Han¹; Yu-Jin Kang¹; Jae-Hyung Park¹; *Jong-Wan Park*¹; ¹Hanyang University
- A29: Wear Resistance of the Ti/TiC Coatings Deposited by Means of Supersonic Cold Gas Spray Technique:** *Jan Kusinski*¹; Sergi Dosta¹; Jorge Garcia-Forgas¹; Slawomir Kac¹; ¹AGH University of Sciences and Technology
- A30: Interatomic Potential Model for Tuning Melting Temperature of Metal Systems:** *Kayoung Yun*¹; Jaeyoung Lee¹; Ho-Seok Nam¹; ¹Kookmin University
- A31: Influence of Cold Deformation on Passive Film Behavior in the Crevice Corrosion Resistance of the ISO NBR 5832-1 Austenitic Stainless Steel for Biomedical Use:** *Cristiaann Hincapie Ramirez*¹; *Alexander Ramirez*²; Isolda Costa¹; ¹Instituto de Pesquisas Energéticas e Nucleares; ²University of São Paulo
- A32: Increase of Efficiency of the Monte Carlo Microstructure Evolution Model by Application of the Multicore CPU Processors:** *Lukasz Madej*¹; Mateusz Sitko¹; Rafal Golab¹; ¹AGH University of Science and Technology
- A33: Materials Solutions for Fouling Mitigation in Oil and Gas:** *Seth Taylor*¹; Les Jackowski¹; ¹Chevron Energy Technology Company
- A34: Mechanical Properties and Fabrication of Al-Si-Cu Sintered-body by SPS Method for Sputtering Target:** *Junho Jang*¹; ¹KITECH
- A35: Metals Extraction Using Cyanex 272, Verstic 10 and Their Mistures as Extractant:** *Adriana Santanilla*¹; Jorge Alberto Soares Tenório¹; Denise Croce Romano Espinosa¹; ¹Polytechnic School of University of São Paulo
- A36: Microstructural Evolution and Anisotropy of Al-Mg Alloy Subjected to Cryorolling through Different Rolling Routes:** *Dharmendra Singh*¹; P. Nageswararao¹; R. Jayaganthan¹; ¹IIT Roorkee
- A37: Microstructure and Mechanical Properties of Friction-stir-processed AA6082 Seamed Tube:** *Kwang-jin Lee*¹; Ram Song²; ¹Korea Institute of Industrial Technology; ²Chonbuk National University
- A38: Numerical Simulation of Solidification Process of Wide and Thick Slab Continuous Casting:** Jingbo Yang¹; Jingshe Li¹; Xiangzhou Gao¹; *Shufeng Yang*¹; ¹University of Science and Technology Beijing
- A39: Numerical Simulation of Pulverized Coal Combustion Behavior in the Traditional Blast Furnace and Oxygen Blast Furnace:** *Jinzhou Liu*¹; Shiyang Zhang¹; Xuefeng She¹; Jingsong Wang¹; Lin Lin¹; Qingguo Xue¹; ¹University of Science and Technology Beijing
- A40: On the Effect of Strain Reversal and the Interactions between Static Recrystallization and Strain-induced Precipitation Process in Microalloyed Austenite:** *Krzysztof Muszka*¹; Thomas Simm²; Paulina Graca¹; Eric Palmiere²; ¹AGH University of Science and Technology; ²The University of Sheffield
- A41: Optical Properties of Cd1-xZnxSe from Density Functional Theory:** *Bimal Sarkar*¹; Ajay Verma²; Gabriela Pavlendova³; Ivan Banik³; ¹Galgotias University; ²Banasthali Vidhyapith; ³Slovak University of Technology
- A42: Quasicrystal Geopolymer Interface:** *Maria Brasileiro*¹; Severino Guedes Lima²; Sandro Torres²; Rosa Marinho³; Francisca Pereira¹; Maria Barroso¹; ¹Federal University of Ceara; ²Universidade Federal da Paraíba; ³Universidade Estadual do Ceara

A43: Research of Weldability of Magnesium Alloy by Nd:YAG and Disk Laser: *Tomáš Kramár*¹; Petr Vondrouš²; Pavel Kováčecy³; ¹Slovak University of Technology; ²Czech Technical University; ³Slovak University of Technology

A44: Preventing Molten Aluminium Water Explosions through Organic Coatings: *Alex Lowery*¹; ¹WISE CHEM LLC

A45: Statistical Analysis of the Stress Serrations Observed during Portevin-Le Chatelier Effect: *Apu Sarkar*¹; P. Barat²; ¹North Carolina State University; ²Variable Energy Cyclotron Centre

A46: The Complete Solid Solution Reinforced Heat-resistant Aluminum Alloy: *Si Young Sung*¹; Jin Pyeong Kim¹; Dong Ok Kim¹; Sang Ho Noh¹; Chang Su Hahn¹; Beom Suck Han¹; Sang Ho Kim²; Young Jig Kim³; ¹KATECH; ²Korea University of Technology and Education; ³Sungkyunkwan University

A47: Synthesis of Nanofiber Membrane by Electrospinning Technique: *Bihter Zeytuncu*¹; Süleyman Akman¹; Onuralp Yucel¹; M. Vezir Kahraman²; ¹Istanbul Technical University; ²Marmara University

A48: The Characterization of Mn Based Self-forming Barriers on Low-k Samples with or without UV Curing Treatment: *Jong-Wan Park*¹; Jae-Hyung Park²; Dong-Suk Han²; So-Ra Shin¹; ¹Division of Materials Science & Engineering, Hanyang University; ²Division of Nanoscale Semiconductor Engineering, Hanyang University

A49: Study on Water Absorbing Behavior of Fine Ore for Sintering Process: *Buxin Su*¹; ¹University of Science and Technology Beijing

A50: Reuse of Waste from the Cutting of Marble for the Production of Synthetic Slag: *Felipe Grillo*¹; Denise Espinosa¹; José Oliveira²; ¹University of Sao Paulo - USP; ²Federal Institute of Espirito Santo

A51: The Effect of Through-thickness Grain Size and Texture Variation on Dynamic Abnormal Grain Growth: *Philip Noell*¹; Nicholas Pedrazas¹; Daniel Worthington²; Thomas Buchheit³; Elizabeth Holm⁴; Eric Taleff¹; ¹University of Texas at Austin, Dept of Mechanical Engrg; ²Fujifilm Dimatix, Inc.; ³Sandia National Laboratory; ⁴Carnegie Mellon University

A52: Synergistic Effect on Extraction of Nickel and Cobalt from Synthetic Sulfate Solution Using Dehpa and Cyanex 272 as Extractants: *Adriana Santanilla*¹; Jorge Alberto Soares Tenório¹; Denise Croce Romano Espinosa¹; ¹Polytechnic School of University of São Paulo

A53: Weibull Statistic for Evaluating Mechanical Behavior and Welding Reliability of Friction Stir Process (FSP) 7075 Aluminium Alloy: *Bayu Wibawa*¹; ¹NCKU (National Cheng Kung University)

A54: Design and Development of a Rotary System for Analysis of Complex Geometric Specimens used in Conjunction with a Scanning Electron Microscope: *Kevin Shiveley II*¹; Adam Shiveley¹; Adam Pilchak²; Jaimie Tiley²; ¹Air Force Research Laboratory; Universal Energy Systems, Inc.; ²Air Force Research Laboratory

A55: Thin Film MIM Capacitors with Single and Bimetal Electrodes: *William Schroeder*¹; ¹Missouri University of Science and Technology

A56: An Investigation on Thermodynamical Behavior of Fe-based Alloy Systems Produced by Aluminothermic Processes: *Cem Colakoglu*¹; Murat Alkan¹; Onuralp Yucel¹; ¹Istanbul Technical University

A57: Development of Deformation Structures in 6061 Al Alloy Processed by Differential Speed Rolling: *Hae Woong Yang*¹; Bong Kwon Chung¹; Joo Hyun Park¹; Young Gun Ko¹; ¹Yeungnam University

A58: Thermographic Monitoring of Fracture Behavior in Railway Wheelset Materials: *Jeongguk Kim*¹; Sung Cheol Yoon¹; ¹Korea Railroad Research Institute

A59: Direct Copper Patterning on Polyethylene Terephthalate Using Surface Modification and Electroless Plating: *Sang Jin Park*¹; Tae-Jun Ko²; Myoung-Woon Moon²; Juil Yoon³; Kwon O Chang³; Jun Hyun Han¹; ¹Chungnam National University; ²Korea Institute of Science and Technology; ³Hansung University

Ultrafine Grained Materials VIII — Poster Session

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

Program Organizers: Suveen Mathaudhu; Yuri Estrin, Monash University; Zenji Horita, Kyushu University; Enrique Lavernia, University of California - Davis; Xiaozhou Liao, The University of Sydney; Lei Lu, Institute for Materials Research; Qiuming Wei, University of North Carolina - Charlotte; Gerhard Wilde, University of Muenster; Yuntian Zhu, North Carolina State University

Monday PM
February 17, 2014

Room: Sails Pavilion
Location: San Diego Convention Center

B58: Application of High-pressure Torsion to ZnO: *Takashi Nagaoka*¹; Makoto Arita¹; Zenji Horita¹; ¹Kyushu University

B59: Corrosion Resistance of the Hydrated Film on Ultrafine-grained Mg Alloy Prepared by Hydrothermal Method: Song Dan¹; Ma Aibin¹; Jiang Jinghua¹; Guo Guanghui¹; Chen Jianqing¹; Yang Donghui¹; ¹Hohai University

B60: Direct Micro-strain Observation of a Trimodal Al-Mg Alloy Using Digital Image Correlation Technique: *Yuzheng Zhang*¹; Troy Topping²; Hanry Yang²; Enrique Lavernia²; Julie Schoenung²; Steven Nutt¹; ¹University of Southern California; ²University of California, Davis

B61: Extension of the Classical Thermodynamic/Kinetic Model to Predict Strain Induced Precipitation in an Ultrafine-grained Al-Cu-Sc Alloy: *Long Jiang*¹; Gang Liu¹; Jun Sun¹; Peng Zhang¹; ¹State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University

B62: Microstructure and Mechanical Properties of Novel CuNb Alloys Prepared by Ball Milling and High Pressure Torsion: *Manuel Abad*¹; Steven Parker¹; Daniel Kiener²; Mateo Primorac³; Peter Hosemann¹; ¹University of California - Berkeley; ²Montanuniversität Leoben; ³Montanuniversität Leoben

B63: Twin Intersection Mechanisms in Nanocrystalline FCC Metals: *Fan Wu*¹; Yuntian Zhu¹; Jagdish Narayan²; ¹NCSU

B64: Ultrafine Grained Zircaloy-2: Processing, Microstructure and Mechanical Behaviour: *Jayaganthan R*¹; Sunkulp Goel¹; Nachiket Keskar¹; Indra Vir Singh¹; Dinesh Srivastava¹; Dey G.K¹; Saibaba N¹; Saibaba N¹; ¹IIT Roorkee

B65: Aging Behavior of Ultrafine Grained Al 6061- TiB₂ Alloy Composite Processed through Cryorolling: *Nageswararao Palukuri*¹; Dharmendra Singh¹; Jayaganthan R¹; ¹IIT Roorkee

B66: Bulk Ultrafine Structured Al-7wt%Si-0.3wt%Mg Alloys Synthesized by High Energy Ball Milling in Combination with Hot Mechanical Consolidation: *Jiamiao Liang*¹; Deliang Zhang¹; ¹Shanghai Jiao Tong University

B67: Cold Spray Processing of Nanocrystalline AA5083 Al Powder: *Mohammad Reza Rokni*¹; Alan Nardi²; Christian Widener¹; Victor Champagne³; ¹SDSM&T; ²United Technologies Research Center; ³U.S. Army Research Laboratory

B68: Development of High Strength Al 7075 Alloy through Cryorolling Followed by Warm Rolling: *Nageswararao Palukuri*¹; Dharmendra Singh¹; Jayaganthan R¹; ¹IIT Roorkee

B69: Dry Sliding Wear Behavior of Al 6061- 3% TiB₂ In Situ Alloy Composite Processed through Cryorolling: *Nageswararao Palukuri*¹; Dharmendra Singh¹; Jayaganthan R¹; ¹IIT Roorkee

B70: Effect of Aging and Multidirectional Forging on Microstructure and Mechanical Properties of Al-Mg-Si Alloy: *Maruff Hussane*¹; Jayaganthan R¹; Nageswararao Palukuri¹; Dharmendra Singh¹; ¹IIT Roorkee

B71: Effect of Sample Size on Microstructure and Mechanical Properties of OFHC Copper Processed by Equal Channel Angular Pressing: *Fan Liu*¹; Jing Tao Wang¹; Ze Ning Mao¹; Cheng Ping Zhou¹; Yao Jiang¹; ¹Nanjing University of Science and Technology



B72: Enhancement of Mechanical Properties of Biocompatible Ti-45Nb Alloy by Hydrostatic Extrusion: *Kadir Ozaltin*¹; Witold Chrominski¹; Mariusz Kulczyk²; Malgorzata Lewandowska¹; ¹Warsaw University of Technology; ²Polish Academy of Sciences

B73: Exceptionally High Strength, Nanocrystalline Mg AZ31 Alloy Produced by Cryomilling and SPS: *Dikai Guan*¹; Mark Rainforth¹; Iain Todd¹; ¹The University of Sheffield

B74: Heterogeneous Dislocation Process, Slip Transfer and Shear Band Formation in the Deformation of Nanotwinned Copper by Molecular Dynamics Simulation: *Xing Zhao*¹; Cheng Lu¹; A.K. Tieu¹; Linqing Pei¹; Lihua Zhan²; Minghui Huang²; ¹University of Wollongong; ²State Key Lab of High-performance Complex Manufacturing, Central South University

B75: Influence of Extrusion Temperature on Tensile Properties of Ultrafine Structured Cu-5vol.%A₁₂O₃ Composites Synthesized by Powder Compact Extrusion: *Dengshan Zhou*¹; Deliang Zhang²; Rob Torrens¹; Charlie Kong³; Paul Munroe³; ¹University of Waikato; ²Shanghai Jiao Tong University; ³The University of New South Wales

B76: Microstructural Changes and Damage Evolution in Ultrafine-grained Copper Microcantilevers during Cyclic Deformation: *Marlene Kapp*¹; Thomas Kremmer²; Christian Motz³; Bo Yang¹; Reinhard Pippan¹; ¹Erich Schmid Institute of Materials Science; ²University of Leoben; ³Saarland University

B77: Microstructural Evolution in Composite Layered Al 6061 Alloy Processed through Cryorolling: Nageswararao Palukuri¹; *Pradeep S*¹; ¹IIT Roorkee

B78: The Study of Crystal Orientation Changes during the High Pressure Torsion Process by Crystal Plasticity Finite Element Simulations: *Peitang Wei*¹; ¹University of Wollongong

B79: Through-process Modeling of Al Alloy Optimization for Cold Spray Processing: *Danielle Belsito*¹; Baillie McNally¹; Victor Champagne, Jr.²; Richard Sisson, Jr.¹; ¹Worcester Polytechnic Institute; ²U.S. Army Research Laboratory

B80: Fatigue Crack Growth Investigations on Ultrafine-grained Metals Produced by High Pressure Torsion: *Thomas Leitner*¹; Anton Hohenwarter¹; ¹Montanuniversity Leoben

B81: Error Propagation in Deformation Parameter Measurement: *Cesar Moreno*¹; Fei Du¹; Shwetabh Yadav²; Tejas Murthy²; Christopher Saldana¹; ¹The Pennsylvania State University; ²Indian Institute of Science

B82: Microstructure and Texture Evolution in Low-carbon Steel Deformed by Differential Speed Rolling Method: Kotiba Hamad¹; Rachmad Bastian Megantoro¹; *Young Gun Ko*¹; ¹Yeungnam University



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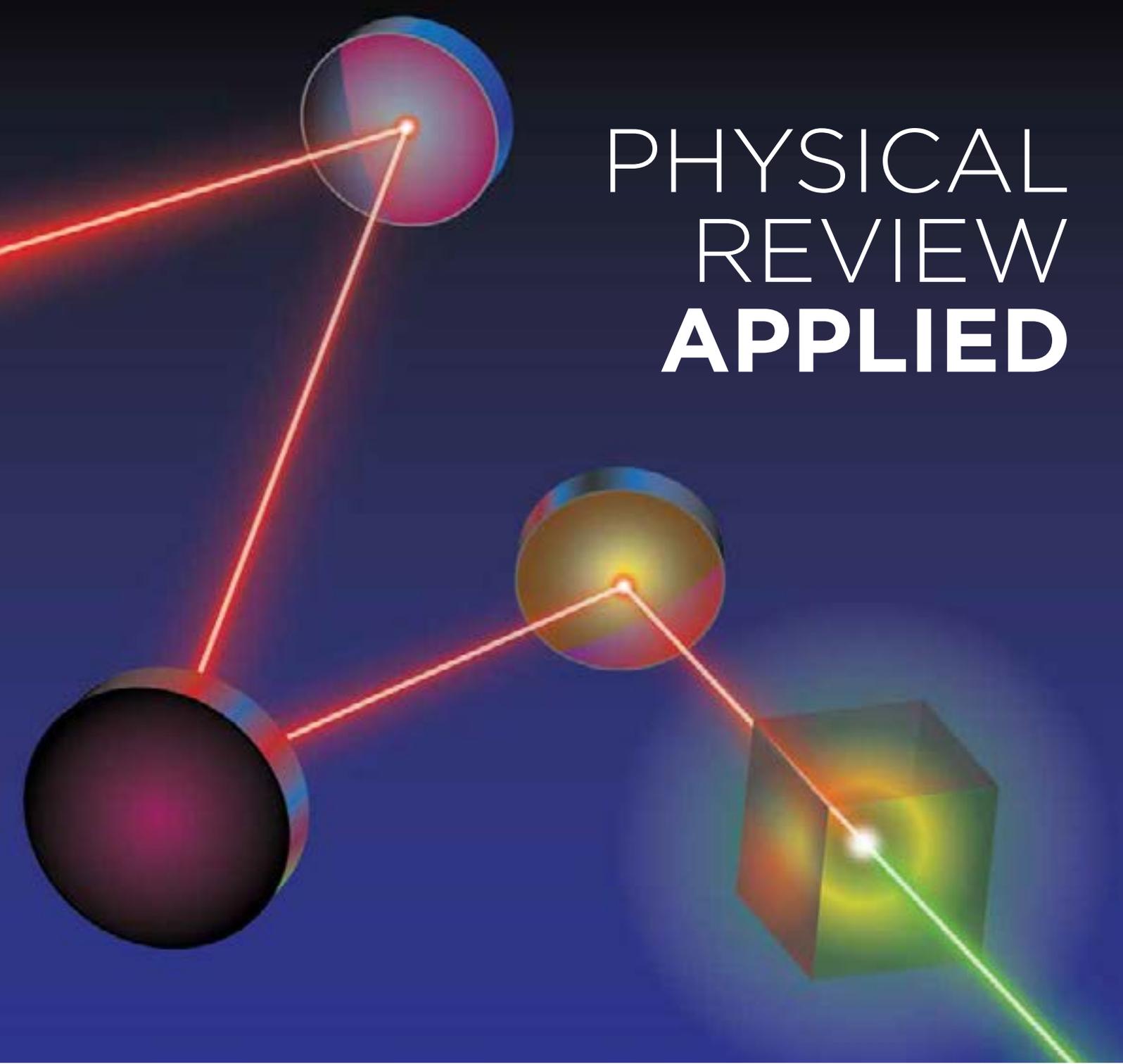
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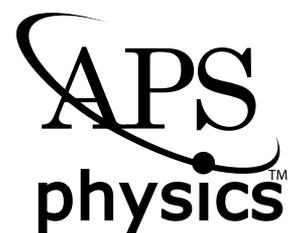
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