



TMS 2012

141st Annual Meeting & Exhibition



SEE PG. 2

March 11 - 15, 2012
Walt Disney World
Swan and Dolphin Resort • Orlando, Florida

FINAL PROGRAM

***“Linking Science and Technology
for Global Solutions”***

www.tms.org/TMS2012



LEARN • NETWORK • ADVANCE



MATERIALS INNOVATION

@TMS

Full Speed Ahead: Materials Innovation @ TMS Launches at TMS 2012

Join TMS in celebrating the launch of its new strategic initiative focused on accelerating the discovery, development, and deployment of materials systems and processes: Materials Innovation @ TMS.

What you experience at TMS 2012 is just the beginning of what Materials Innovation @ TMS can offer you. For the latest news on Materials Innovation @ TMS programs, resources, and activities, visit our website at materialsinnovation.tms.org.

Materials Innovation @ TMS Learning and Networking Opportunities

TMS 2012 Annual Meeting of the Membership

“Fueling Growth and Fostering Innovation”

Featuring the Official Membership Introduction of Materials Innovation @ TMS

Sunday, March 11: 7-8 p.m.

Walt Disney World Dolphin Resort—Southern II

Materials Innovation Gallery (See page 9 of this program for details.)

A showcase of ideas, techniques, and principles that can potentially transform the future of materials and manufacturing innovation.

TMS 2012 Exhibition * Booth 441

Open during regular Exhibition hours, starting at noon on Monday, March 12.

Special Plenary Session (See page 14 of this program for details.)

“Reaching New Heights: Materials Innovation in the Aerospace Industry”

Wednesday, March 14, 2-3:45 p.m.

Walt Disney World Dolphin Resort—Northern E2

2012 Federal Funding Workshop and Reception (See page 14 of this program for details.)

“Funding Opportunities to Advance the Materials Genome Initiative”

4 p.m.: Panel Discussion

5:15-6 p.m.: Networking Reception with Panelists

Walt Disney World Dolphin Resort—Northern C

Preview TMS’s New Open Access Journal (See page 9 of this program for details.)

Integrating Materials and Manufacturing Innovation (IMMI).

Opportunities to interact with IMMI editor, Chuck Ward, will be available during the conference.

For more information:

Stop by the Materials Innovation @ TMS Information Center located at the TMS Member Welcome Center .

Welcome to the TMS 2012 Annual Meeting & Exhibition!



Dear Colleagues & Friends!

As president of TMS, I offer a warm welcome to our members, society guests, exhibitors, and all other attendees who have gathered here in sunny Orlando, Florida for our 141st annual conference.

While compelling technical programming takes center stage at TMS2012, this meeting will offer a full menu of special events and new incentives for building our future with the TMS Foundation.

We are also introducing a new TMS2012 mobile application for smart phone users that will keep all conference information at your fingertips. See page 2 for more details about this amazing conference tool!

There are also a number of events planned this week to launch our new strategic initiative, Materials Innovation @ TMS, focused on accelerating the discovery, development, and deployment of materials systems and processes. I encourage you to browse the Materials Innovation Gallery at the Exhibition (Page 9), attend the plenary session, "Reaching New Heights: Materials Innovation in the Aerospace Industry," (Page 20) and participate in the other Materials Innovation @ TMS activities highlighted in this program.

Here is a brief synopsis of the other valuable offerings at TMS2012:

Technical Program & Poster Session – Nearly 70 symposia will present the research of some of the world's most distinguished materials scientists and engineers. Technical areas to be covered include: Advanced Characterization, Modeling and Materials Performance; High Performance Materials; Light Metals: Aluminum, Magnesium, and Titanium; Materials and Society: Energy and Sustainable Production; Materials Processing and Production; and Nanoscale and Amorphous Materials.

Networking – Second only to the technical programming offered at TMS2012 are the invaluable networking opportunities. By attending TMS2012 you reap the countless benefits of connecting with colleagues from around the world in person!

Awards Presentation – Honoring outstanding colleagues will be even more exciting with the TMS-AIME Awards Banquet at the World ShowPlace Pavilion East Hall in EPCOT. The banquet will conclude with an amazing fireworks display, "Disney IllumiNations: Reflections of Earth."

Special Lectures – Compelling research and food for thought is on the agenda when you choose to attend a luncheon lecture, plenary session or presentation. See page 22 for more information.

Student Events – TMS realizes the future of the society and profession lies in its student members. Visit the Student Poster contest or enjoy the spirit of competition at the Materials Bowl, sponsored by Alcoa, all day Sunday. Details on student events are on page 28.

Continuing Education – Feel the power of knowledge. TMS2012 features compelling courses and workshops designed to enhance your conference experience.

Welcome to TMS2012 in warm and wonderful Orlando, Florida! Be prepared for the ultimate conference experience.

Sincerely,

Garry Warren

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MEETING INFORMATION




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MEETING INFORMATION

Full Conference Registration

Your full conference registration includes a collected proceedings CD and your badge ensures admission to each of these events:

- Technical & Poster sessions
- Student Poster Contest
- Women in Science Breakfast Lecture
(pre-registrants only) 
- Admission to TMS Materials Bowl Championship
- Three-day pass to TMS2012 Exhibition
- President's Welcoming Reception
(located in the Exhibit Hall)
- Happy Hour Reception *(located in the Exhibit Hall)*

Internet Options

Free wireless service will be available in the Author's Coffee area located in **Atlantic B Hall** in the **Dolphin Hotel** Monday through Thursday.

Username: **TMSWireless**

Password: **tms2012ame**

(case sensitive, use all lower case)

CyberCenter Internet work stations, sponsored by Stellar Materials Inc., will be available in the exhibit hall located in the Pacific Room of the Dolphin Resort during regular show hours.

NEW! TMS2012 Mobile Application

TMS is pleased to offer this new mobile application available for the 2012 Annual Meeting and Exhibition. Attendees will be able to easily download this free conference tool from the **Apple iTunes Store for you iPhone or iPad** and through the **Android Marketplace**

Features:

- Latest programming schedule
- Interactive exhibit map
- Hotel information
- Speaker information
- Evaluations
- Schedule changes via Push Notifications
(when not using application)
- Much more!



Through the application you will also be able to organize and track those events you wish to attend by building a "My Schedule" list plus quickly narrow current presentations with the "What's on Now?" feature.

To download the TMS Mobile Application, search "TMS Annual Meeting" in your respective device store.

Policies

Badges

All attendees must wear registration badges at all times during the conference to ensure admission to events included in the paid fee such as technical sessions, exhibition and receptions. "Exhibit Only" badges provide exclusive admittance to the show floor for events in the exhibit hall. "Guest" badges are for spouses or companions of registered attendees and used as identification only. "Guest" and "Exhibit Only" attendees may not attend technical sessions.

Refunds

The deadline for all refunds was February 15, 2012. No refunds will be issued at the conference. Fees and tickets are nonrefundable.

Photography Notice

By registering for this conference, all attendees acknowledge that they may be photographed by TMS personnel while at events and that those photos may be used for promotional purposes.

Audio/Video Recording Policy

TMS reserves the right to all audio and video reproductions of presentations at TMS sponsored meetings. 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. Contact TMS Technical Programming at (724) 776-9000, ext. 212 to obtain a copy of the waiver release form.

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.

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 in the bins located in the Registration area.

Be materials-minded.  Join TMS in reducing, reusing and recycling.

Schedule of Events

as of February 23, 2012

TMS Meetings & Events are scheduled on the following days, times and locations:

Key: **D** Dolphin Hotel **S** Swan Hotel

FUNCTION	TIME	LOCATION	ROOM	ACCESS*
Saturday, March 10, 2012				
Exhibit Move-In	8:00 AM to 5:00 PM	D	Pacific	O

Committee Meetings				
Professional Registration Writers Workshop and Committee Meeting	9:00 AM to 5:00 PM	S	Peacock 1	R
TMS Foundation Board of Trustees Meeting	2:00 PM to 5:00 PM	D	President's Suite #200097	R
Professional Registration Committee Dinner	6:00 PM to 8:00 PM	S	Peacock 2	R

FUNCTION	TIME	LOCATION	ROOM	ACCESS*
Sunday, March 11, 2012				

All Conference Events				
Registration	7:00 AM to 6:00 PM	D	Atlantic	O
TMS Member Welcome Center <i>Materials Innovation at TMS Info Center, Visit Orlando, Visit San Antonio, and TMS Housing Representatives available through Thursday, March 15</i>	7:00 AM to 6:00 PM	D	Atlantic	O
TMS Foundation Center	7:00 AM to 6:00 PM	D	Atlantic	O
Exhibit Move-In	8:00 AM to 5:00 PM	D	Pacific	O
General & Student Poster Sessions Set-Up	12:00 PM to 5:00 PM	D	Atlantic	O
Young Leader Meet the Candidate Poster Session	6:30 PM to 8:00 PM	D	Southern I	O
<i>Poster Set-Up</i>	12:00 PM to 6:00 PM	D	Southern I	O
TMS Programming Support Center	2:00 PM to 5:00 PM	D	Atlantic	O

* O - Open to all attendees
R - Restrictions Apply

T - Ticketed Event

T1 - Pre-Registration Ticket Required

T2 - Ticket Required, can be purchased/picked up at door



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Schedule of Events

as of February 23, 2012

Key: **D** Dolphin Hotel **S** Swan Hotel

Special Presentations				
Short Course: Electrowinning and Electrorefining of Copper and Zinc	8:30 AM to 4:00 PM	D	Europe 2	T
Short Course: Integrated Computational Materials Education	8:30 AM to 4:00 PM	D	Europe 3	T
Short Course: Process Energy Modeling: Spreadsheets and Beyond	8:30 AM to 4:00 PM	D	Europe 6	T
Short Course: Estimation of Slag Properties	8:30 AM to 4:30 PM	D	Europe 10	T
Workshop: Lead Free Solders	9:00 AM to 4:30 PM	D	Asia 3	T1
Short Course/Workshop Breaks, Lunch	10:30 AM to 3:00 PM	D	Asia 4 & 5	T
Volunteer Leadership Program Leadership Materials: Tools to Build Your Career	1:00 PM to 4:00 PM	D	Northern A4	R
ABET Refresher Training	3:00 PM to 5:00 PM	S	Sandpiper	R
TMS Meeting of the Membership	7:00 PM to 8:00 PM	D	Southern II	O

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MEETING INFORMATION

Meet the Candidate Employment Poster Session

Sunday, March 11 • 6:30 to 8 p.m. • Dolphin Hotel, Atlantic Room

Organized by the TMS Young Leaders Committee, this new TMS event is designed to create networking opportunities for young professionals that will allow them to connect with potential employers for post-doctoral, full-time, or faculty positions. Candidates will present a poster to potential employers from various universities, industries, and national labs.

Visit the San Antonio, Texas Booth...site of TMS2013

Next to the Visit Orlando Concierge booth in the TMS Member Welcome Center Located in the Dolphin Hotel Atlantic Hall



Schedule of Events

as of February 23, 2012

Key: **D** Dolphin Hotel

S Swan Hotel


Committee Meetings				
TMS Financial Planning Committee	7:00 AM to 9:30 AM	S	Parrot 1	R
Professional Registration Leadership Committee	8:00 AM to 10:00 AM	S	Teal	R
TMS Board of Directors Meeting	9:30 AM to 1:30 PM	S	Lark	R
REWAS Organizing Committee	10:00 AM to 11:30 AM	S	Peacock 1	R
Recycling and Environmental Technologies Committee	12:00 PM to 1:30 PM	S	Toucan 1	O
Accreditation Committee	12:30 PM to 2:30 PM	S	Toucan 2	R
Aluminum Processing Committee	1:30 PM to 2:30 PM	S	Parrot 1	O
Magnesium Committee	1:30 PM to 3:00 PM	S	Pelican 2	O
TMS Nominating Committee	2:00 PM to 3:00 PM	S	Parrot 2	R
Aluminum Committee	2:00 PM to 4:00 PM	S	Lark	O
Materials Characterization Committee	3:00 PM to 5:00 PM	S	Macaw 1	O
Program Committee	3:00 PM to 5:00 PM	S	Heron	R
Public and Governmental Affairs Committee	3:30 PM to 5:00 PM	S	Macaw 2	R
Nanomaterials Committee	4:00 PM to 5:00 PM	D	Europe 4	O
Thin Films and Interfaces Committee	4:00 PM to 5:00 PM	S	Pelican 2	O
PRICM 8 International Organizing Committee	4:00 PM to 6:00 PM	S	Parrot 2	R
LMD Council	4:30 PM to 6:00 PM	S	Ibis	R
Pyrometallurgy Committee	4:30 PM to 6:00 PM	S	Toucan 1	O
Content Development and Dissemination Committee	5:00 PM to 7:00 PM	S	Parrot 1	R
Nanomechanical Behaviors Materials Behavior Committee	5:45 PM to 6:45 PM	S	Toucan 2	O
Mechanical Behaviors of Materials Committee	7:00 PM to 8:30 PM	S	Toucan 2	O
Alloy Phases Committee	7:30 PM to 9:30 PM	S	Mockingbird	O
Phase Transformations Committee	7:30 PM to 9:30 PM	S	Toucan 1	O

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Key: **D** Dolphin Hotel **S** Swan Hotel

Student Events

Materials Bowl	12:00 PM to 8:30 PM	D	Southern V	O
Elimination Rounds	12:00 PM to 3:00 PM			
Championship Round	8:00 PM to 8:30 PM			
Student Network Mixer	8:30 PM to 10:30 PM	D	Southern III	T2

Social Functions

Fellows and Invited Guests Reception	4:30 PM to 6:30 PM	D	Northern C	R
New Member/Young Leader Reception	5:00 PM to 6:00 PM	D	Southern IV	T2

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MEETING INFORMATION

TMS ANNUAL MEETING OF THE MEMBERSHIP

Sunday, March 11 • 7 to 8 p.m. • Dolphin Southern II

Don't miss this important membership engagement opportunity—highlighted by the official introduction of **Materials Innovation @ TMS**, the society's newest strategic initiative.

Also planned:

- Preview of new projects and programs for 2012
- TMS's most recent accomplishments — including publication of its latest energy materials report on behalf of the U.S. Department of Energy
- TMS's recent and expected financial performance

Speakers:

- Garry Warren.....2011 TMS President
- Wolfgang Schneider.....2012 TMS President
- Stanley M. Howard.....TMS Financial Planning Officer
- Warren H. HuntTMS Executive Director

Member Welcome Center

Dolphin Hotel, Atlantic Hall • Daily

Sunday: 7 a.m. to 6 p.m. • Monday: 7 a.m. to 6 p.m. • Tuesday: 7 a.m. to 5:30 p.m.

Wednesday: 7 a.m. to 5:00 p.m. • Thursday: 7 a.m. to 3:30 p.m.

Learn and gather information about your membership, volunteering with TMS, the TMS Foundation, and all of our upcoming events and activities! Discover all TMS can offer as, "Your Professional Partner for Career Advancement".

Schedule of Events

as of February 23, 2012

Key: **D** Dolphin Hotel

S Swan Hotel

FUNCTION	TIME	LOCATION	ROOM	ACCESS*
Monday, March 12, 2012				
All Conference Events				
Exhibit Move-In	7:00 AM to 11:00 AM	D	Pacific	
Author's Coffee	7:00 AM to 8:00 AM	D	Atlantic	R
Registration	7:00 AM to 6:00PM	D	Atlantic	O
TMS Member Welcome Center	7:00 AM to 6:00 PM	D	Atlantic	O
TMS Foundation Center	7:00 AM to 6:00 PM	D	Atlantic	O
TMS Programming Support Center	7:00 AM to 5:00 PM	D	Atlantic	O
Technical Symposia	8:30 AM to 6:00 PM	See Technical Program for complete schedule and symposia locations		
General Poster Session (Authors Present)	5:00 PM to 6:30 PM	D	Atlantic	O
<i>Poster Set Up</i>	7:00 AM to 8:00 AM	D	Atlantic	O
Materials Innovation at TMS Gallery	12:00 PM to 6:30 PM	D	Pacific	O
TMS 2012 Exhibition	12:00 PM to 6:30 PM	D	Pacific	O
President's Welcoming Reception	5:00 PM to 6:30 PM	D	Pacific	O

Special Presentations				
2012 Aluminum Plenary: "Aluminum Technology 2020: A Look Ahead"	8:00 AM to 12:00 PM	D	Southern III	O
Congressional Fellow Informational Meeting	1:00 PM to 2:00 PM	S	Parrot 2	O
IOMMMS Global Materials Forum: Materials In a Green Economy: An International Perspective	2:00 PM to 6:30 PM	D	Northern A4	O
Emeritus Professor George D.W. Smith Honorary Dinner	6:30 PM to 8:00 PM	S	Lark	T
Randall M. German Honorary Dinner	6:30 PM to 8:00 PM	S	Toucan	T
Rob Ritchie Honorary Dinner	6:30 PM to 8:00 PM	S	Osprey 1	T
Dinner in Memory of Patrick Veyssiere	6:30 PM to 8:00 PM	S	Osprey 2	T
T.T. Chen Honorary Dinner	6:30 PM to 8:00 PM	D	Northern B	T

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as of February 23, 2012

Key: **D** Dolphin Hotel **S** Swan Hotel

Committee Meetings				
MetTrans A Board of Review	7:00 AM to 8:00 AM	S	Toucan	R
Process Technology & Modeling Committee	7:00 AM to 8:00 AM	D	Europe 8	O
Membership and Student Development Committee	8:45 AM to 10:00 AM	D	Europe 4	R
TMS Past Presidents	11:00 AM to 1:00 PM	S	Teal	R
EPD Council	12:00 PM to 2:00 PM	D	Asia 5	R
Superalloys Programming Committee	12:00 PM to 2:00 PM	S	Heron	R
ICME Committee	12:30 PM to 2:00 PM	S	Peacock	O
EMPMD Council	12:30 PM to 2:00 PM	D	Europe 7	R
Powder Materials Committee	12:30 PM to 2:00 PM	D	Europe 4	O
Springer TMS-ASM Strategic Planning	2:00 PM to 5:00 PM	S	Egret	R
TMS-ASM Leadership Meeting	3:45 PM to 4:45 PM	D	President's Suite #200097	R
REWAS Committee	4:30 PM to 6:00 PM	D	Peacock	R
Energy Conversion and Storage Committee	5:00 PM to 6:00 PM	D	Europe 4	O
Superalloys Organizing Committee	5:00 PM to 7:00 pm	S	Heron	R
Chemistry and Physics of Materials Committee	5:30 PM to 6:30 PM	D	Europe 8	O
IOMMMS Committee	5:30 PM to 6:30 PM	D	Northern A4	O
Nuclear Materials Committee	5:30 PM to 7:00 PM	S	Swan 1	O
Advanced Characterization Testing and Simulation Committee	5:45 PM to 6:45 PM	S	Parrot 1	O
Composite Materials Committee	5:45 PM to 6:45 PM	S	Parrot 2	O
Surface Engineering Committee	6:00 PM to 7:00 PM	S	Macaw 1	O
Biomaterials Committee	6:00 PM to 7:00 PM	D	Europe 4	O
Hydrometallurgy and Electrometallurgy Committee	6:00 PM to 7:00 PM	D	Oceanic 5	O
Materials and Society Committee	6:00 PM to 8:00 PM	S	Peacock	O
Technical Division Chairs Meeting	6:30 PM to 8:30 PM	S	Teal	R
Magnetic Materials Committee	8:00 PM to 9:00 PM	D	Europe 10	O

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MEETING INFORMATION

2012 Aluminum Plenary:

Aluminum Industry Technology 2020, A Look Ahead

Monday, March 12 • 8:30 a.m. to Noon • Dolphin Hotel, Southern III

Schedule of Events

as of February 23, 2012

Key: **D** Dolphin Hotel

S Swan Hotel

Student Events				
Student Poster Contest — Preliminary Judging	5:00 PM to 6:30 PM	D	Atlantic	O
Poster Set Up	7:00 AM to 8:00 AM	D	Atlantic	O

Social Functions				
Women in Science Breakfast	7:00 AM to 8:00 AM	D	Northern B	T
TMS & ASM Board of Trustees Social	8:30 PM to 9:30 PM	D	Northern E4	R

* O - Open to all attendees

T - Ticketed Event

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T1 - Pre-Registration Ticket Required

T2 - Ticket Required, can be purchased/picked up at door

IOMMMS Global Materials Forum: Materials in a Green Economy: An International Perspective, Monday, March 12 • 2 p.m. • Dolphin Hotel, Northern A4

Ten presentations, including an invited talk by AIME President Brajendra Mishra, "The Role of Materials Recycling in Economic Sustainability", will be offered.



MATERIALS INNOVATION GALLERY

Monday, March 12 through Wednesday, March 14
TMS2012 Exhibition Hall - Dolphin Hotel, Pacific Room

Welcome to TMS's showcase of ideas on how the techniques and principles that form the foundation for Materials Innovation @ TMS can potentially transform the development and deployment of advanced materials. A special feature of the TMS 2012 Exhibition, the Gallery has been designed to provide a visually compelling glimpse of how these concepts can potentially transform the future of materials and manufacturing innovation. You'll also have the opportunity to learn about the array of resources that are being offered as part of Materials Innovation @ TMS — highlighted by a preview of *Integrating Materials and Manufacturing Innovation (IMMI)*, TMS's new, peer-reviewed Open Access publication.

The Materials Innovation Gallery will be open throughout the conference during regular exhibition hours, so stop by often!

MEETING INFORMATION



WORLDWIDE PROJECTS AND EXPERIENCE

The Next Generation of Process Control & Automation:

FLOGEN

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- Non-Ferrous Metals
- Precious Metals
- Materials Recycling

Increase Productivity - Decrease Cost - Protect Environment

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Schedule of Events










as of February 23, 2012

Key:  Dolphin Hotel





 Swan Hotel

FUNCTION	TIME	LOCATION	ROOM	ACCESS*
Tuesday, March 13, 2012				

All Conference Events

Author's Coffee	7:00 AM to 8:00 AM		Atlantic	R
Registration	7:00 AM to 5:30 PM		Atlantic	O
TMS Member Welcome Center	7:00 AM to 5:30 PM		Atlantic	O
TMS Foundation Center	7:00 AM to 5:30 PM		Atlantic	O
General Poster Session Gallery	7:00 AM to 5:30 PM		Atlantic	O
TMS Programming Support Center	7:00 AM to 5:00 PM		Atlantic	O
Technical Symposia	8:30 AM to 6:00 PM	See Technical Program for complete schedule and symposia locations		
TMS 2012 Exhibition	10:30 AM to 6:00 PM		Pacific	O
Materials Innovation at TMS Gallery	10:30 AM to 6:00 PM		Pacific	O
Happy Hour Reception	5:00 PM to 6:00 PM		Pacific	O

Special Presentations

Young Leaders Tutorial Luncheon	12:00 PM to 2:00 PM		Osprey 1	 T
EPD/MPMD Luncheon: Institute of Metals/ Robert Franklin Mehl Award featuring Subra Suresh	12:00 PM to 2:15 PM		Northern C	 T

Committee Meetings


Electronic Packaging and Interconnection Materials Committee	7:00 AM to 8:00 AM		Parrott	O
MetTrans B Board of Review	7:00 AM to 8:00 AM		Toucan	R
MPMD Council	7:00 AM to 9:00 AM		Peacock	R
Honors and Professional Recognition Committee	7:30 AM to 8:30 AM		Teal	R
Young Leaders Business Committee	9:00 AM to 10:30 AM		Toucan	R
TMS-FEMS Leadership Meeting	9:00 AM to 10:00 AM		President's Suite #200097	R
Springer Editorial Manager Orientation	12:00 PM to 1:00 PM		Peacock	R
SMD Council	12:00 PM to 2:00 PM		Parrott	R
Education Committee	12:30 PM to 2:00 PM		Toucan	R

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Key: **D** Dolphin Hotel **S** Swan Hotel

TMS-MetSoc Leadership Meeting	2:00 PM to 3:00 PM	D	President's Suite #200097	R
TMS Executive Committee	3:00 PM to 4:00 PM	D	President's Suite #200097	R
Energy Committee	5:00 PM to 6:00 PM	S	Parrott	O
Computational Materials Science and Engineering Committee	5:30 PM to 6:30 PM	S	Lark	O
Refractory Metals Committee	5:30 PM to 6:30 PM	S	Sandpiper	O
High Temperature Alloys Committee	5:30 PM to 7:00 PM	S	Peacock	O
Solidification Committee	6:00 PM to 7:00 PM	S	Teal	O
Titanium Committee	6:00 PM to 7:00 PM	D	Oceanic 3	O
Shaping and Forming Committee	6:00 PM to 8:00 PM	D	Oceanic 8	O
Corrosion and Environmental Effects Committee	6:30 PM to 7:30 PM	S	Lark	O

Student Events

Student Poster Contest- Best of Show Judging	10:30 AM to 11:30 AM	D	Atlantic	O
Student Career Forum	3:00 PM to 5:00 PM	S	Osprey 2	O

Social Functions

TMS-AIME Awards Reception	6:00 PM to 6:45 PM		EPCOT	T1
Shuttles will transport ticketed attendees to EPCOT	5:30 PM to 6:30 PM	D	Europe Foyer	T1
TMS-AIME Awards Banquet	6:45 PM to 10:00 PM		EPCOT	T1
Shuttles will transport attendees to Swan, Dolphin, Caribbean Beach, and Coronado Springs Resorts	9:15 PM to 9:45 PM		EPCOT	T1

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MEETING INFORMATION

Searching for Volunteer Opportunities?

TMS Technical Committees need your expertise!

Learn how by attending Technical Committee Meetings at TMS2012. Most meetings are open to all guests. See the Calendar of Events for sessions, times & locations.

Our volunteers are priceless.

Foundation Booth

Dolphin Hotel – Atlantic Room • Daily



Sunday: 7 a.m. to 6 p.m. • Monday: 7 a.m. to 6 p.m. • Tuesday: 7 a.m. to 5:30 p.m.
Wednesday: 7 a.m. to 3:30 p.m. • Thursday: 7 a.m. to 3:30 p.m.

PREMIUM ITEMS DONATION PROGRAM*

Help the TMS Foundation continue to support these society-building initiatives:

- Young Leaders Program
- Materials & Society (*Past projects include: TMS- Engineers Without Borders-USA Mali, Africa Project Partnership*)
- Vittorio DeNora Prize for Environmental Improvements in Metallurgical Industries
- TMS Scholarship Program

Receive these items for donations of the following correlating amounts:



\$10 – TMS Pin



\$25 – TMS Umbrella



\$50 -- Periodic Table Mug



\$250 – Apple TV



\$500 – Kindle Fire



\$1,000 – iPad

**The Premium Item Donation Program will run through April 15.*

Disney Drawings

Enter to win Disney Park Hopper passes through a daily drawing held for the duration of the conference. Simply drop your business card off at the Foundation Booth.



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Schedule of Events

as of February 23, 2012

Key: **D** Dolphin Hotel **S** Swan Hotel

FUNCTION	TIME	LOCATION	ROOM	ACCESS*
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Wednesday, March 14, 2012

All Conference Events

Author's Coffee	7:00 AM to 8:00 AM	D	Atlantic	R
Registration	7:00 AM to 5:00 PM	D	Atlantic	O
TMS Member Welcome Center	7:00 AM to 5:00 PM	D	Atlantic	O
TMS Foundation Center	7:00 AM to 5:00 PM	D	Atlantic	O
TMS Programming Support Center	7:00 AM to 5:00 PM	D	Atlantic	O
Poster Tear Down	3:00 PM to 5:00 PM	D	Atlantic	O
General Poster Session	7:00 AM to 3:00 PM	D	Atlantic	O
Poster Session Tear Down	3:00 PM to 5:00 PM	D	Atlantic	O
Technical Symposia	8:30 AM to 6:00 PM	See Technical Program for complete schedule and symposia locations		
Materials Innovation at TMS Gallery	10:30 AM to 3:30 PM	D	Pacific	O
TMS 2012 Exhibition	10:30 AM to 3:00 PM	D	Pacific	O

Special Presentations

LMD Luncheon	12:00 PM to 2:00 PM	S	Osprey	T
Materials Innovation Plenary Session	2:00 PM to 3:45 PM	D	Northern E2	O
Federal Funding Workshop & Reception	4:00 PM to 6:00 PM	D	Northern C	O

MEETING INFORMATION

Special Plenary Session:

Reaching New Heights: Materials Innovation in the Aerospace Industry

Wednesday, March 14 • Dolphin Hotel, Northern E2

New materials development is at a crucial stage of evolution, with Integrated Computational Materials Engineering (ICME) and new data sharing breakthroughs paving the way to remarkable time and cost reductions in product deployment. Through a series of compelling case studies, this program offers insights that can be applied to many aspects of product manufacturing, with significant impact on economic security and the race to heightened competitiveness.

Federal Funding Workshop and Reception

“Funding Opportunities to Advance the Materials Genome Initiative”

Panel Discussion: 4 p.m. • Reception: 5:15 to 6 p.m.

Wednesday, March 14 • Dolphin Hotel, Northern C

Don't miss this highly interactive session on funding opportunities related to the U.S. Materials Genome Initiative (MGI), as presented by program leaders from an array of federal funding agencies. Networking reception sponsored by the Georgia Institute of Technology.

Schedule of Events

as of February 23, 2012

Key: **D** Dolphin Hotel

S Swan Hotel

Committee Meetings				
TMS Board of Directors	8:00 AM to 11:30 AM	S	Lark	O
Graduate Student Advisory Council	9:00 AM to 10:00 AM	S	Toucan	R
Ni-Co 2013 Organizing Committee	12:00 PM to 1:30 PM	S	Sandpiper	R
Met Trans B Editorial Meeting	1:00 PM to 3:00 PM	S	Parrot 2	R
TMS-SME Leadership Meeting	3:30 PM to 4:30 PM	D	President's Suite #200097	R
Women in Materials Science and Engineering Committee	4:00 PM to 5:00 PM	D	Asia 5	R
Materials and Manufacturing Leaders Summit Reception & Dinner	6:00 PM to 9:00 PM	D	Northern D	R

* O - Open to all attendees
R - Restrictions Apply

T - Ticketed Event

T1 - Pre-Registration Ticket Required

T2 - Ticket Required, can be purchased/picked up at door

MEETING INFORMATION



CIVIL INFRASTRUCTURE

COMMUNICATIONS

MINING & METALS

OIL, GAS & CHEMICALS

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TMS 2012

141st Annual Meeting & Exhibition

Schedule of Events

as of February 23, 2012

Key: **D** Dolphin Hotel **S** Swan Hotel

FUNCTION	TIME	LOCATION	ROOM	ACCESS*
----------	------	----------	------	---------

Thursday, March 15, 2012

All Conference Events

Author's Coffee	7:00 AM to 8:00 AM	D	Atlantic	R
Registration	7:00 AM to 3:30 PM	D	Atlantic	O
TMS Member Welcome Center	7:00 AM to 3:30 PM	D	Atlantic	O
TMS Foundation Center	7:00 AM to 3:30 PM	D	Atlantic	O
TMS Programming Support Center	7:00 AM to 3:30 PM	D	Atlantic	O
Technical Symposia	8:30 AM to 6:00 PM	See Technical Program for complete schedule and symposia locations		
Registration Satellite Desk	3:30 PM to 5:00 PM	D	Convention Foyer	O
TMS Programming Support Center	3:30 PM to 5:00 PM	D	Convention Foyer	O

Committee Meetings

Materials and Manufacturing Leaders Summit	8:00 AM to 4:30 PM	D	Northern D	R
Materials and Manufacturing Leader Summit Lunch	12:00 PM to 1:00 PM	D	Northern E2	R

* O - Open to all attendees

R - Restrictions Apply

T - Ticketed Event

T1 - Pre-Registration Ticket Required

T2 - Ticket Required, can be purchased/picked up at door

MEETING INFORMATION



TAR ALLIANCE

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Walt Disney World Swan & Dolphin Resort Map



Restaurants

- 1 Shula's Steak House
- 2 Lobby Lounge
- 3 Cabana Bar and Beach Club
- 4 Picabu
- 5 The Fountain
- 6 Todd English's bluezoo
- 7 Fresh Mediterranean Market

Other

- 8 Lobby / Front Desk
- 9 Concierge
- 10 Disney Guest Services
- 11 Business Center
- 12 Shipping Desk
- 13 Shopping
- 14 Health Club
- 15 Camp Dolphin
- 16 Guest Laundry
- 17 Game Room
- 18 Mandara Spa

Outdoor

- 19 Disney Shuttle Bus
- WT Disney Water Taxi
- 20 Grotto Pool and Beach
- WP Whirlpools
- 21 Children's Playground
- 22 Cabana Beach Hut
- 23 Pacific Terrace
- 24 Cabana Deck
- 25 Lap Pool
- 26 Spring Pool
- 27 Kiddie Pool
- SA Smoking Area



Restaurants

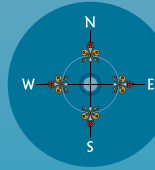
- A Splash Grill
- B Splash Terrace
- C Garden Grove
- D Kimonos
- E Java Bar
- F IL Mulino New York Trattoria

Other

- G Lobby / Front Desk
- H Concierge / Disney Guest Services / Japanese Hospitality Desk
- I Business Center / Shipping Desk
- J Convention Registration Desk
- K Shopping
- L Health Club
- M Game Room
- N Bakery Display

Outdoor

- O Disney Shuttle Bus
- WT Disney Water Taxi
- P Lake Terrace
- Q Swan Terrace
- R Lap Pool
- WP Whirlpool
- S Crescent Terrace
- T Osprey Terrace 1
- U Osprey Terrace 2
- SA Smoking Area



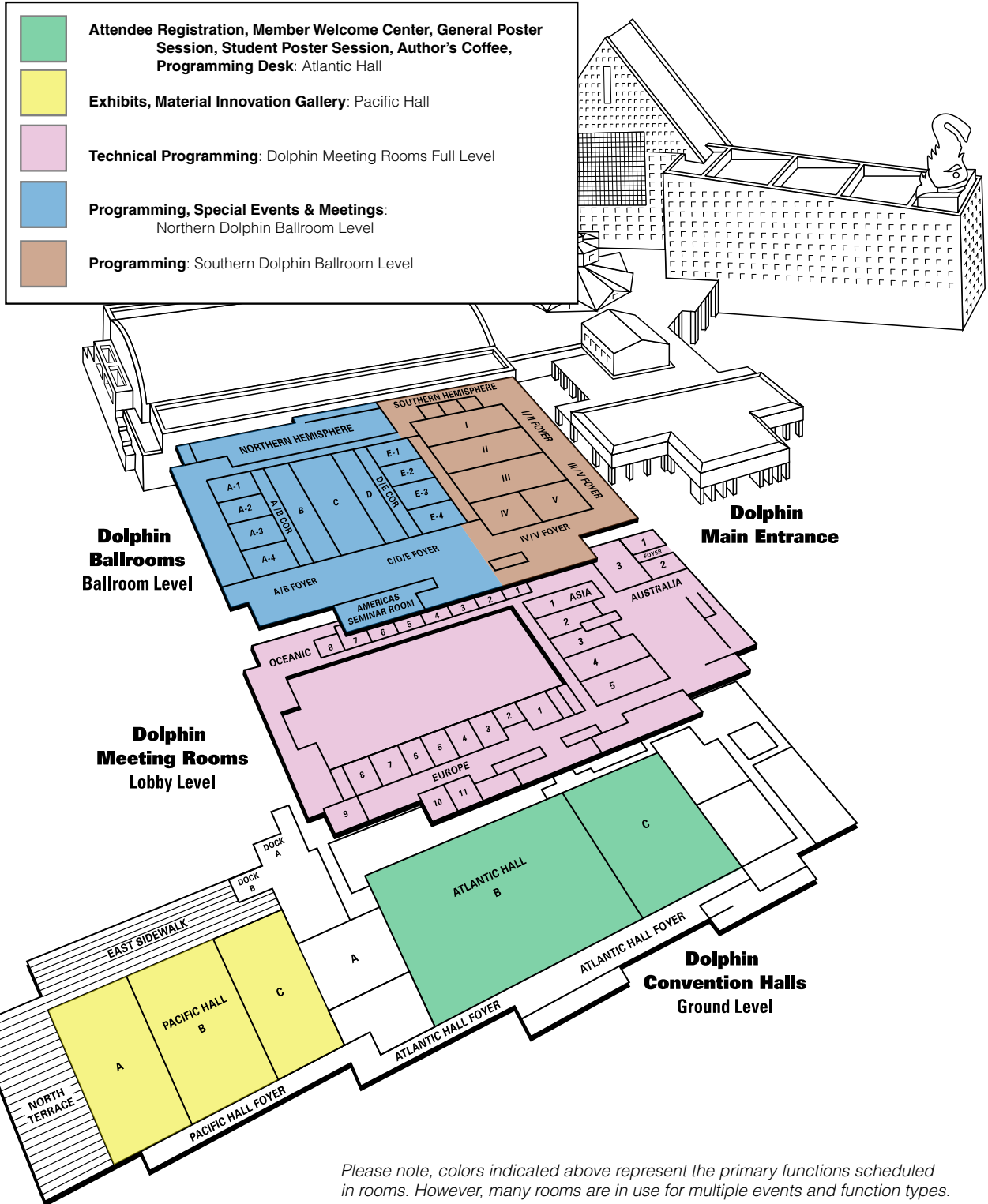
MEETING INFORMATION



TMS 2012

141st Annual Meeting & Exhibition

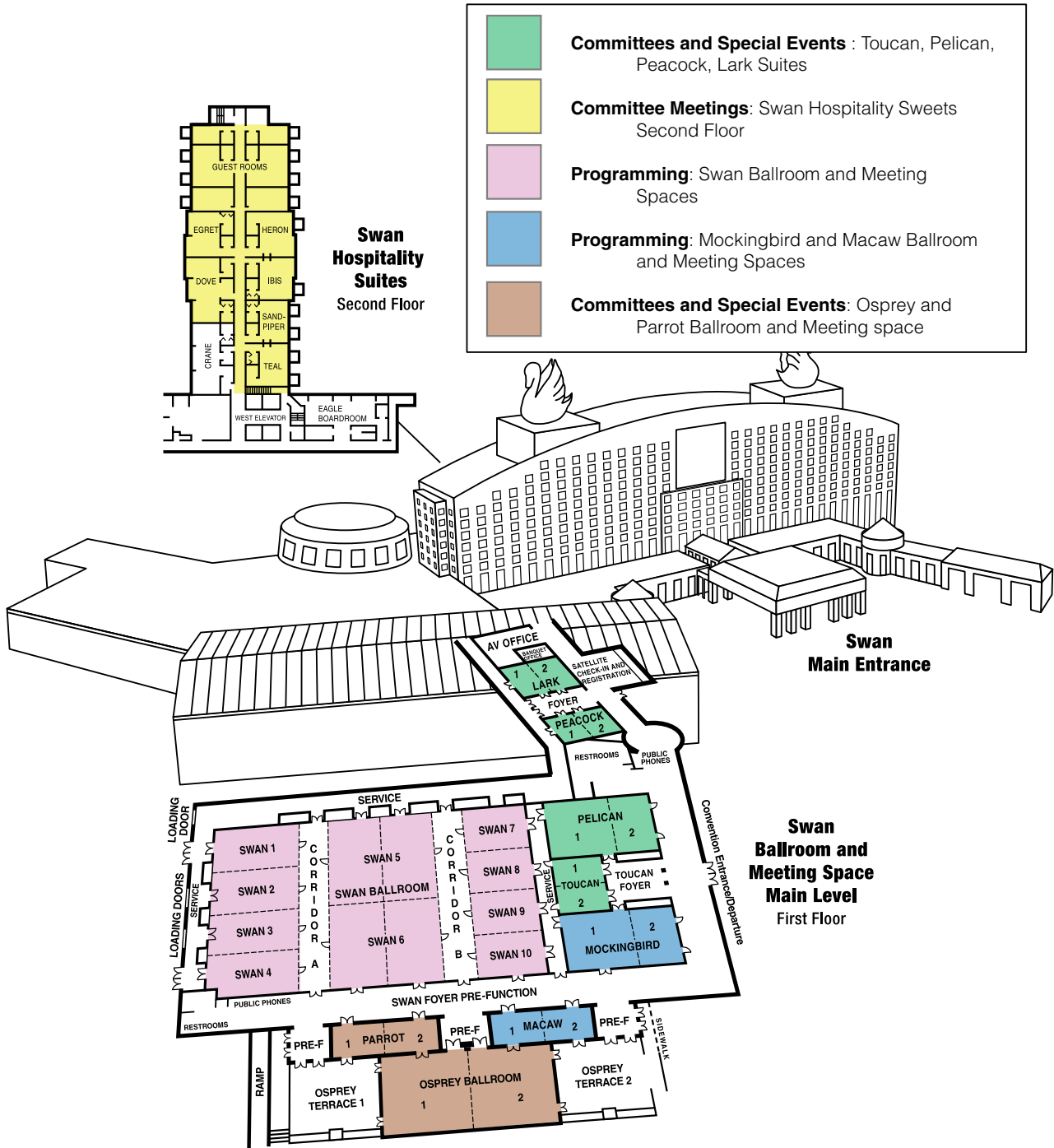
Dolphin Hotel Map



MEETING INFORMATION

Please note, colors indicated above represent the primary functions scheduled in rooms. However, many rooms are in use for multiple events and function types. Please refer to the Schedule of Events for detailed locations and times.

Swan Hotel Map



Please note, colors indicated above represent the primary functions scheduled in rooms. However, many rooms are in use for multiple events and function types. Please refer to the Schedule of Events for detailed locations and times.

Special Plenary • Reaching New Heights: Materials Innovation in the Aerospace Industry

Wednesday, March 14 • 2 p.m. to 3:45 p.m.
Dolphin Hotel, Northern E2

The aerospace industry is a demonstrated leader in materials innovation and acceleration. Through a series of compelling case studies, this program offers insights that can be applied to many aspects of product manufacturing, with significant impact on economic security and the race to heightened competitiveness. (Presented in cooperation with *Integrating Materials and Manufacturing Innovation (IMMI)* TMS's new Open Access journal.)

Moderator: Charles Ward, Chief, Metals, Ceramics, & Nondestructive Evaluation Division, U.S. Air Force Research Laboratory; Editor, *Integrating Materials and Manufacturing Innovation*

TOPICS AND SPEAKERS:



James Warren
Leader, Thermodynamics and Kinetics Group, Metallurgy Division National Institute of Standards and Technology; Technology Advisor to the Director on the Materials Genome

Topic: Materials Genome Initiative

The Materials Genome Initiative (MGI) is a new, multi-stakeholder effort to develop an infrastructure for accelerating advanced materials discovery and deployment in the United States. This talk will provide a brief introduction to the MGI, and set the stage for the case studies discussed in this session.



Robert E. Schafrik
General Manager, Materials and Process Engineering Department GE Aviation

Topic: ICME: Promise and Future Directions

GE Aviation has been engaged in various aspects of integrated computational materials engineering (ICME) for 10 years, driven primarily by the desire to implement new materials development within half the standard time. To accomplish this, a close relationship with design engineering and supply chain has been established.



Charles Kuehmann
President and CEO
QuesTek Innovations LLC

Topic: Lessons Learned from the Trenches and Implications on ICME and the MGI

The Materials Genome Initiative challenges innovation in materials modeling and engineering methods, enabling new materials to reach commercial application in half the time of current capabilities. In this new paradigm, a specific engineering problem must dictate the priorities for developing MGI-and ICME-related modeling, tools and data, not the other way around.



Michael Dudzik,
Vice President Science & Technology, Washington Operations, Lockheed Martin Corporation

Rick Barto, Program Manager, Advanced Technology Laboratory, Lockheed Martin Corporation



Topic: Enabling the Era of Hybrid Materials – A Tipping Point of Change

The ongoing state-of-the-art transition in the field of materials science, from metal alloys to composites to hybrid materials, offers the aerospace market unique design solutions to meet ever demanding requirements in product manufacturing cost reduction, system performance enhancement, and total lifecycle sustainability. A review of recent successes achieved through better utilization of computational physics, material data management, certification, and the manufacturing supply chain will be presented.

Materials Innovation @ TMS is TMS's new strategic initiative. The following programs have been developed as part of this effort.

Federal Funding Workshop & Reception

Funding Opportunities to Advance the Materials Genome Initiative

(Organized by the TMS Public and Governmental Affairs Committee)

Wednesday, March 14

Panel Discussion: 4 p.m. • Reception: 5:15 p.m.

Dolphin Hotel, Northern C

This highly interactive session will examine funding opportunities related to the Materials Genome Initiative (MGI), as presented by program leaders from an array of federal funding agencies. Panelists will provide an overview of current MGI activities in their agencies and present a look to the future, with significant time for questions from the audience. Continue the dialogue during the networking reception, sponsored by the Georgia Institute of Technology, designed to promote one-on-one conversation with the panelists.

TOPICS AND SPEAKERS



Diana Farkas,

Program Director, Condensed Matter and Materials Theory, Division of Materials Research National Science Foundation

Topic: Looking for Transformative Approaches for the Materials Genome Initiative



Diana Bauer

Director of the Office of Economic Analysis U.S. Department of Energy

Topic: New Efforts on Computational Materials



Julie Christodoulou

Director, Naval Materials Division Office of Naval Research

Topic: Basic Research Challenge in Materials



Michael Caton

Senior Materials Research Engineer Materials & Manufacturing Directorate Air Force Research Laboratory

Topic: Advancing Superalloys

Don't Miss These Other Materials Innovation @ TMS Opportunities

Materials Innovation Gallery: Browse a visually compelling showcase of ideas—developed as a special feature of the TMS 2012 Exhibition—on implementing materials innovation principles, techniques, and concepts. (See page 9 for details.)

Preview of Integrating Materials and Manufacturing Innovation (IMMI): Learn more about TMS's new Open Access journal that combines peer review rigor with enhanced digital content to rapidly share knowledge and learning on innovations, from materials discovery through manufacturing. Opportunities to interact with the *IMMI* editor, Chuck Ward, will be presented throughout the conference.

Annual Meeting of the Membership: Start your conference by attending this important membership engagement opportunity—highlighted by the official introduction of **Materials Innovation @ TMS**, (See page 6 for details.)

For additional information, stop by the Materials Innovation @ TMS Information Center at the TMS Member Welcome Center or visit our website at materialsinnovation.tms.org.



TMS 2012

141st Annual Meeting & Exhibition

Lectures & Luncheons

Extraction & Processing Division Distinguished Lecturer-Plenary Session
International Smelting Technology Symposium
(Incorporating the 6th Advances in Sulfide Smelting Symposium)

Monday, March 12 • 8:40 a.m.
Dolphin Hotel, Northern A3



Speaker: **Theo Lehner**,
Boliden Mineral AB, Sweden

Topic: Conservation & Development: Industrial Learning in Non-Ferrous Smelting

About the Topic: This lecture will present thoughts and experience on the following issues in Non-Ferrous Smelting: conservation and its corollary waste; development; industrial learning curves. Waste occurs in many shapes, be it losses of material, loss of health, loss of ability or knowledge. Development in non-ferrous smelting over the last decades has changed many a flow sheet, but also ended many projects. Operations have adapted to new processes and new conditions.

Young Leaders Tutorial Luncheon Lecture

Tuesday, March 13 • Noon
Swan Hotel, Northern C



Speaker: **Michael Demkowicz**,
Massachusetts Institute of Technology, USA

Topic: Becoming a Better Scientist by Learning the History of Science

About the Topic: A scientist educated in the current curricula finds it difficult to defend scientific perspectives to skeptical non-scientists. He will propose that this educational gap be filled by making the history of science part of the typical science curriculum. In this talk, Demkowicz will present several topics from the history of science that could serve as case studies to be incorporated into such a class.

Light Metals Division Luncheon Lecture

Wednesday, March 14 • Noon
Swan Hotel, Osprey



Speaker: **Diana Bauer**,
Director of the Office of Economic Analysis, U.S. Department of Energy's Office of Policy and International Affairs.

Topic: The Department of Energy's 2011 Critical Materials Strategy

About the Topic: Bauer will present an overview of the DOE's Critical Materials Strategy.

Invited Talks



Speaker: **Brajendra Mishra**,
AIME President, a professor at the Colorado School of Mines and 2006 TMS President

Brajendra Mishra will present two talks:

IOMMMS Global Materials Forum: Materials in a Green Economy: An International Perspective Symposium

Monday, March 12 • 2:10 to 2:30 p.m.
Dolphin Hotel North A4

Presentation Title: The Role of Materials Recycling in Economic Sustainability.

Integrative Materials Design: Performance and Sustainability Symposium

Tuesday, March 13 • 11:05 a.m.
Dolphin Hotel Europe 2

MEETING INFORMATION

Award-Winning Speakers

Extraction & Processing Division/Materials Processing & Manufacturing Joint Division Luncheon and Institute of Metals/ Robert Franklin Mehl Award Lecture

Tuesday, March 13 • Noon
Swan Hotel, Northern C



Speaker: **Subra Suresh**,
Director of the U.S. National
Science Foundation (NSF)

Topic: Nanomechanics of Engineered and Biological Materials

Vittorio de Nora Prize Lecture

Tuesday, March 13 • 11:25 a.m.
Dolphin Hotel, Europe 5



Speakers: **Antoine Allanore**,
Massachusetts Institute of Technology, USA; and



James Yurko,
Electrolytic Research Corporation,
USA

Topic: Development of Electrometallurgical Processes for 21st Century Metal Extraction

About the Topic: This presentation will first briefly present some existing extraction methods, in particular electrometallurgical ones, pointing-out the advantages and issues related to the current state-of-the art. The second part of the talk will present how breakthrough electrochemical processes have recently been developed to adapt to environmental and energy constraints, taking the example of low- and high-temperature electrochemical extraction processes scaled-up for transition and light metals.

2012 Shri Ram Arora Award

Wednesday, March 14 • 3 p.m.
Swan Hotel, Pelican 2



Speaker: **Anjali Sharma**,
University of Delhi

Topic: Novel Sensor Structure of SnO₂ Thin Film Integrated with Catalytic Micro-Discs for the Detection of Trace Level NO₂ Gas

About the Topic: An improvement in the sensing response, response time and recovery time could be attributed to the spill-over of sensing gas molecules over the uncovered surface of SnO₂ thin films by WO₃ micro-discs catalyst.

JIM International Scholar Award Winner

Tuesday, March 13 • 8:30 a.m.
Dolphin Hotel, Southern II



Speaker: **Noritaka Saito**,
Kyushu University

Topic: Effect of Shear Stress on Crystallization Behavior of Mold Flux for Continuous Casting

About the Topic: This presentation will focus on how modern steelmaking involves handling slags and fluxes mostly in the temperature region between liquidus and solidus, to fully exploit their functional capabilities and the various methods researchers have developed to study the crystallization behavior of them.



TMS 2012

141st Annual Meeting & Exhibition

Networking & Social Events

Student Mixer

Sunday, March 11 • 8:30 10:30 p.m.
Dolphin Hotel, Southern III


Meet and mingle with the next generation of materials scientists and engineers as peer mentors in an informal social setting.

President's Welcoming Reception

Monday, March 12 • 5 to 6:30 p.m.
Dolphin Resort, Pacific Room

Gather with 2011 TMS President Garry Warren and colleagues for an informal social event in the exhibition hall.

Honorary & Memorial Dinners

All honorary dinners will be held Monday, March 12. Tickets are needed for admission to these events and may be purchased at the Registration Desk in Dolphin Resort, Atlantic Room. 

T.T. Chen Honorary Dinner

6:30 to 8 p.m. • Dolphin Resort, Northern B Room

Emeritus Professor George D.W. Smith Honorary Dinner

6:30 to 8 p.m. • Swan Resort, Lark Room

Robert Ritchie Honorary Dinner

6:30 to 8 p.m. • Swan Resort, Osprey 1

Randall M. German Honorary Dinner

6:30 to 8 p.m. • Swan, Toucan Room

Dinner in Memory of Patrick Veysseyre

6:30 to 8 p.m. • Swan, Osprey 2

MEETING INFORMATION

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HYDRO

141st TMS-AIME Annual Awards Banquet

including Dinner, Awards Presentation, and Installation of the 2012 President

**Tuesday, March 13,
World ShowPlace Pavilion, EPCOT**

TMS will honor the best among the materials science & engineering community. Incoming 2012 TMS President Wolfgang Schneider will also be recognized and will present his vision for the new year. This year, the banquet will be held in the **World ShowPlace Pavilion in EPCOT** and will include a **Disney fireworks display, "IllumiNations: Reflections of Earth,"** to close the event. **Shuttles will board at 5:30 p.m. outside of the Europe Ballrooms Foyer on the Lobby/3rd Level of the Dolphin Hotel and depart for EPCOT at 5:45 p.m.**

Attendees are reminded to wear their name badges and bring their banquet tickets in order to board the busses and gain admittance to the **EPCOT World Showplace**. For guests needing assistance, a shuttle will be available for transport to the private area.

Following the banquet, TMS staff and Walt Disney World Guides will direct guests to the **Italy Pavilion Dock** for the fireworks show and accompanying dessert. Shuttles will meet guests behind the Italy Pavilion for transport back to the Swan and Dolphin, the Coronado Springs, and the Caribbean Beach Resorts at the conclusion of **IllumiNations**.

ADVANCE TICKETS ARE REQUIRED FOR THIS LIMITED SEATING EVENT. 



**Wolfgang Schneider,
2012 TMS President**

About the 2012 TMS President

Wolfgang Schneider is the head of the research and development center of Hydro Aluminum Rolled Products Business in Bonn, Germany and is also a professor of metallurgy at the Technical University of Berlin. A TMS member since 1996, Schneider's vision for his presidency is growing the mission of TMS, with more emphasis on professional development.

"During my presidency, my focus will be on innovation that can expand the product and service portfolio of TMS. One specific area I feel requires more attention is our professional education strategy. I would also like to see more emphasis on the technical agenda and volunteer structure with the focus on technical divisions and committees, which are responsible for the major programming activities of TMS." Schneider received his Dipl.-Ing. degree in foundry technology, as well as his doctorate in metallurgy, from the Technical University of Berlin. He has published more than 140 technical papers and is named as an inventor in nine patents.

As a member of the Society, Schneider served as chair of the TMS Light Metals Division from 2007-2010 and on the TMS Board of Directors from 2003 to 2006 in the membership development area. He has also volunteered in various other capacities for TMS since 1997. His service included: Cast Shop Technology Symposium subject chair, Aluminum Committee chair, Strategic Advisory Committee member, and Nominating Committee member. Schneider has also received several Society awards, including the TMS Light Metals Award in both 1990 and 1995. He has been active in a number of other societies, such as the German Society of Material Science DGM and the German Foundrymen Society VDG.



Society Awards presented by 2011 TMS President Garry Warren

Garry W. Warren is professor in the Department of Metallurgical and Materials Engineering, and Director of the Materials Science Program at the University of Alabama, Tuscaloosa. He is active in the TMS Extraction & Processing Division (EPD) and has served in numerous capacities. Warren has also served at the society level on the TMS Programming Committee, the TMS Financial Planning Committee, the TMS Publications Coordinating Committee, and the TMS Board of Directors.

SOCIETY AWARDS

TMS Fellows Class of 2012

Ian Baker

Sherman Fairchild Professor of Engineering,
Dartmouth University

David Dunand

James and Margie Krebs
Professor, Northwestern University

Sung-Kwon Kang

Research staff, IBM Corporation

Pradeep Rohatgi

Professor, University of Wisconsin

Alexander Scott Distinguished
Service Award

Ramana Reddy

University of Alabama

Application to Practice Award

Mark Taylor

University of Auckland

Brimacombe Medalist(s)

Robert Hyers

University of Massachusetts

Paul Krajewski

General Motors Company

Zi-Kui Liu

Pennsylvania State University

Bruce Chalmers Award

A. Lindsay Greer

University of Cambridge

Cyril Stanley Smith Award

Mats Hillert

Royal Institute of Technology

Early Career Faculty Fellow Award

Michael Demkowicz

Massachusetts Institute of
Technology

Educator Award

Marc DeGraef

Carnegie Mellon University

Institute of Metals/Robert Franklin

Mehl Award

Subra Suresh

National Science Foundation

Morris Cohen Award

Michael Ashby

University of Cambridge

Shri Ram Arora Award

Anjali Sharma

University of Delhi

Vittorio de Nora Prize for
Environmental Improvements in
Metallurgical Industries

Antoine Allanore

Massachusetts Institute of
Technology

James Yurko

Electrolytic Research Corp.

DIVISION AWARDS

*Presented at technical
division-related events.*

Electronic, Magnetic & Photonic Materials Division

Distinguished Scientist/Engineer

KN Mani Subramanian

Michigan State University

Distinguished Service

Srinivas Chada

Power-One Renewable Energy
Solutions

John Bardeen Award

John William Morris, Jr.

University of California

JEM Best Paper

Joyelle J. Harris

Exponent Failure Analysis
Associates

Extraction & Processing Division

EPD Distinguished Lecturer

Theodor Lehner

Boliden Mineral AB

EPD Distinguished Service

Tzong Chen

CANMET-MMSL

Technology Award

Jiann-Yang "Jim" Hwang

Xiang Sun

Xiaodi Huang

Michigan Technological University

141st TMS-AIME Annual Awards Banquet

including Dinner, Awards Presentation, and Installation of the 2012 President

DIVISION AWARDS

Science Award

James. E. Miller

Richard B. Diver

Nathan P. Siegel

Eric N. Coker

Andrea Ambrosini

Daniel E. Dedrick

Mark D. Allendorf

Anthony H. McDaniel

Gary L. Kellogg

Roy E. Hogan

Ken S. Chen

Ellen B. Stechel

Sandia National Labs

Light Metals Division

Distinguished Service Award

Eric Nyberg

Pacific Northwest National Lab

Technology Award

Mark Taylor

University of Auckland

Light Metals Award

Xiangwen Wang

Garry Tarcy

Eliezer Batista

Geff Wood

Alcoa Inc

Aluminum Reduction Technology
Award

Feng Naixiang

Northeastern University

Tian Yingfu

Chongqing Tiantai Aluminum

Industry Co Ltd

Peng Jianping

Wang Yaowu

Qi Xiquan

Tu Ganfeng

Northeastern University

Bauxite & Alumina Award

Lucy Martin

Steven Howard

Bechtel Australia Pty Ltd

Electrode Technology for Aluminum
Production Award

Olivier Trempe

Daniel Larouche

Michel Guillot

Mario Fafard

Universite Laval

Donald Ziegler

Alcoa Inc

Warren Peterson Cast Shop for
Aluminum Production Award

Dmitry Eskin

Brunel University

Mehdi Lalpoor

Delft University of Technology/

Materials Innovation Inst (M2i)

Laurens Katgerman

Delft University of Technology

Energy Best Paper – Professional
Award

Peter Loutzenhiser

Anastasia Stamatian

ETH Zurich

Willy Villasmil

Anton Meier

Paul Scherrer Institute

Energy Best Paper – Student Award

Peng Li

Qing-bo Yu

Qin Qin

Northeastern University

JOM Best Paper Award

Pascal Coursol

Patrick Coulombe

Serge Gosselin

Dany Lavoie

Aluminerie Alouette

Jean-Marc Simard

Exaprom

Jerry Marks

J. Marks and Associates

Sylvain Fardeau

Rio Tinto Alcan

Energy Best Paper

Peter G. Loutzenhiser

Anastasia Stamatian

Aldo Steinfeld

ETH Zurich

Willy Villasmil

Anton Meier

Paul Scherrer Institute

Magnesium Best Paper -

Application Award

Kazutaka Okamoto

Hitachi Research Lab

Masato Sasaki

Norikazu Takashi

Hitachi

Qudong Wang

Yan Gao

Dongdi Yin

Changjiang Chen

Shanghai Jiao Tong University

Magnesium Best Paper -
Fundamental Research Award

Kiran Solanki

Mehul Bhatia

Arizona State University

Amitava Moitra

Mississippi State University

Magnesium Best Paper -
Student Award

Lennart Stutz

Helmholtz-Zentrum Geesthacht

GmbH

Jan Bohlen

Dietmar Letzig

Karl Kainer

GKSS Forschungszentrum

Geesthacht GmbH

Materials Processing & Manufacturing Division

Distinguished Scientist/Engineer
Award

John Morral

Ohio State University

Distinguished Service

Joy Forsmark

Ford Motor Company

Structural Materials Division

Distinguished Scientist/Engineer
Award

Yuntian Zhu

North Carolina State University

Distinguished Service Award

Eric Taleff

University of Texas

JOM Best Paper Award

Scott Hollister

University of Michigan



AIME Awards Presented by Brajendra Mishra

Brajendra Mishra is president of The American Institute of Mining, Metallurgical, and Petroleum Engineers. A member of TMS since 1992, Mishra served as president in 2006. He is a professor of metallurgical and materials engineering and the associate director of the Kroll Institute for Extractive Metallurgy and the Advanced Coatings and Surface Engineering Laboratory, Colorado School of Mines. He is also the associate director of the National Science Foundation Industry-University Cooperative Research Center for Resource, Recovery and Recycling.

AIME AWARDS

AIME Henry DeWitt Smith
Scholarship

Jennifer Carter

The Ohio State University

Eric Gratz

Boston University

Karem Tello

Colorado School of Mines

Mengtao Xie

Illinois Institute of Technology

AIME Honorary Membership

David Laughlin

Carnegie Mellon University

AIME Champion H. Mathewson
Award

Adam L. Pilchak

U.S. Air Force Research Laboratory

Robert E.A. Williams

James C. Williams

The Ohio State University

AIME Rossiter W. Raymond
Memorial Award

David Rowenhorst

Alexis Lewis

Naval Research Laboratory

Robert Lansing Hardy Award

Andrew Minor

University of California

STUDENT AWARDS

2011 ASCE Alfred Noble Prize

Markus Buehler

Raffaella Paparcone

Massachusetts Institute of
Technology

Graduate Outstanding Student Paper

First Place: **Zhinan An**

University of Tennessee

Second Place: **Indranil Lahiri**

Florida International University

Undergraduate Outstanding Student
Paper

First Place: **Sumit Goenka**

Carnegie Mellon University

Second Place: **Tasha Totten**

Washington State University

TMS J. Keith Brimacombe
Presidential Scholarship

Rachel Garrick

University of Illinois

**Young Leader Professional
Development Award Winners**

EMPMD Young Leader Professional
Development

Chao-Hong Wang

National Chung Cheng University

Ashwin Ramasubramaniam

University of Massachusetts

EPD Young Leader Professional
Development

John Carpenter

Los Alamos National Lab

Soobhankar Pati

Metal Oxygen Separation
Technologies

LMD Young Leader Professional
Development

Qizhen Li

University of Nevada

Preteesh Patel

Light Metals Research Center

OTHER AWARDS

MPMD Young Leader Professional
Development

Nathan Mara

Los Alamos National Lab

Kantesh Balani

Indian Institute of Technology

SMD Young Leader Professional
Development

Nima Rahbar

University of Massachusetts

Clarissa Yablinsky

University of Wisconsin

Young Leader International Scholar
Award

Douglas Spearot

University of Arkansas



TMS 2012

141st Annual Meeting & Exhibition

Student Activities

Sunday

TMS2012 Materials Bowl

Noon to 8:30 p.m. • Dolphin Hotel, Southern IV
Elimination Rounds – Noon to 3 p.m.
Final Championship Round – 8:00 p.m.

Student teams compete for cash prizes and earn the right to take home the traveling trophy after conquering three rounds of intense, materials science-based questions.

Student Mixer

8:30 to 10:30 p.m. • Dolphin Hotel, Southern III

Put on your dancing shoes to meet and mingle with peers in an informal social setting.

Monday

Poster Contest Judging

5 to 6:30 p.m. • Dolphin Hotel, Atlantic

Tuesday

Best of Show Judging – Ribbon Presentation

10:30 to 11:30 a.m. • Dolphin Hotel, Atlantic

Career Forum

3 to 5 p.m. • Swan Hotel, Osprey 2

Organized by the TMS Young Leader Committee, this session will feature speakers from a variety of materials science backgrounds and career stages who discuss how to navigate a career path to ultimate goals.

Career Panel

Julia Greer,
Cal Tech

Eric Brown,
Los Alamos National
Laboratory

Frank DelRio,
NIST

Alpesh Shukla,
Lawrence Berkeley National
Laboratory

Paul Ohodnicki,
National Energy Technology
Laboratory

Jud Ready,
Georgia Tech

George T. "Rusty" Gray III,
Los Alamos National
Laboratory

Eric Schmidt,
V&M Star

Frank Balle
University of Kaiserslautern

Chris Weinberger,
Sandia National Laboratory

SPECIAL INFORMATIONAL SESSION: Congressional Science and Engineering Fellowship Program

Monday, March 12 • 1 to 2 p.m.
Swan Hotel, Parrot 2 Room

Speakers:



Jennifer Nekuda Malik

2011-2012 TMS/MRS Congressional Science and Engineering Fellow

Topic: Engineering Public Policy: Science in Government



Edward Herderick

2009-2010 TMS/MRS/ACerS Congressional Science and Engineering Fellow

Topic: The Transition from PhD candidate to Congressional Staffer to Engineer in the Materials Industry

Have you ever considered learning about the field of science policy in the U.S. Senate and House of Representatives?

The TMS/MRS Congressional Fellowship Program offers an amazing opportunity for scientists at all stages of their careers to spend a year as a special legislative assistant in the United States Congress in Washington, DC.

TMS2012 offers a snapshot of this experience via this informational session featuring testimonials from Jennifer Nekuda Malik, current Fellow, who is a staff member on the Senate Energy and Natural Resources Committee, and Edward Herderick, who served on the staff of Ohio Senator Sherrod Brown during his Fellowship. The pair will discuss their day-to-day agenda, education, and benefits to their personal career advancement. An opportunity for questions and discussion will follow.

MEETING INFORMATION

Mark Your Calendar

Upcoming Meetings

TMS provides numerous opportunities for advancing research and collaboration on the latest technology through a series of diverse conferences and workshops. For the ultimate in professional development and networking, make the face-to-face connections at these events designed to engage the materials science and engineering community.

For more information visit the [TMS Meetings and Events page at www.tms.org/Meetings/meetings_events.aspx](http://www.tms.org/Meetings/meetings_events.aspx).



2012 Near Net Shape Manufacturing Workshop

April 11-13, 2012

iWireless Center, Moline, Illinois • USA

13th International Conference on Aluminum Alloys (ICAA -13)

June 3-7, 2012

Carnegie Mellon University • Pittsburgh, Pennsylvania

2012 NanoNuclear Workshop

June 5-7, 2012

Gaithersburg Marriott Washingtonian Center, Gaithersburg, Maryland

International Conference on 3D Materials Science 2012

July 8-12, 2012

Seven Springs Mountain Resort • Seven Springs, Pennsylvania

2012 Methods for 3D Microstructural Studies Workshop

July 13-14, 2012

Carnegie Mellon University • Pittsburgh, Pennsylvania

TMS 2012 Industrial Aluminum Electrolysis Course: The Definitive Theory and Practice of Primary Aluminum Production

September 9-14, 2012

Rio Tinto Alcan • Jonquiere, Quebec, Canada

Superalloys 2012: The 12th International Symposium on Superalloys

September 9-13, 2012

Seven Springs Mountain Resort • Champion, Pennsylvania

Materials Science & Technology 2012 Conference & Exhibition

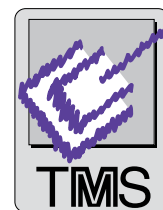
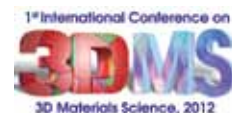
October 7-11, 2012

Pittsburgh, Pennsylvania

TMS 2013: Linking Science and Technology for Global Solutions

March 3-7, 2013

San Antonio, Texas



TMS

The Valuable Resource that Keeps on Giving...

TMS 2012 Annual Meeting Proceedings

The following stand-alone book titles and supplemental proceedings will be available:

- 3rd International Symposium on High Temperature Metallurgical Processing
- CFD Modeling and Simulation in Materials Processing
- Characterization of Minerals, Metals, and Materials
- Electrometallurgy 2012
- Energy Technology 2012
- EPD Congress 2012
- International Smelting Technology Symposium
- Light Metals 2012
- Magnesium Technology 2012
- TMS2012 Supplemental Proceedings: Volume 1: Materials Processing and Interfaces
- TMS2012 Supplemental Proceedings: Volume 2: Materials Properties, Characterization, and Modeling
- T.T. Chen Honorary Symposium on Hydrometallurgy, Electrometallurgy and Materials Characterization

Attendees may purchase books at the Wiley booth located adjacent to the Member Welcome area outside the exhibit hall.

Don't Miss These TMS-Wiley Book Author Events!

Meet an authority on materials processing applications, Arthur E. Morris, coauthor of *Handbook on Material and Energy Balance Calculations in Materials Processing, Third Edition*. Purchase a signed copy of his book for a special show price of \$99.95.*

Take a look at engineering education today—with an eye to tomorrow—with Diran Apelian, coeditor of *Shaping Our World: Engineering Education for the 21st Century*. Buy a signed copy of his book for a special show price of \$35.*

Stop by the Wiley booth in the registration area for more information.

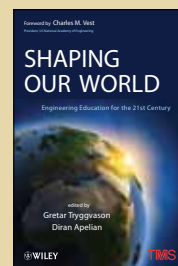
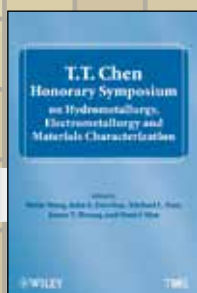
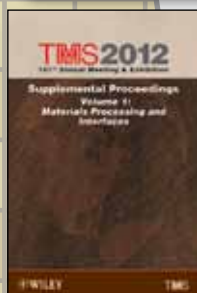
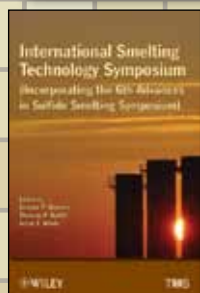
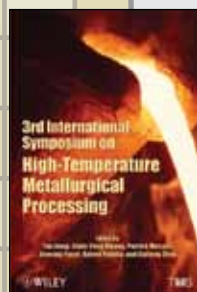
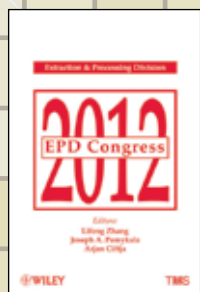
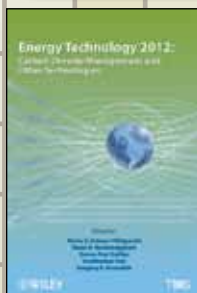
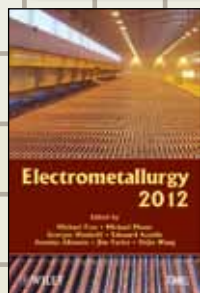
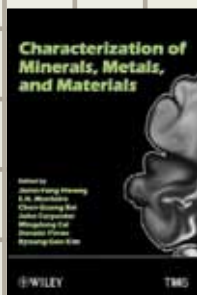
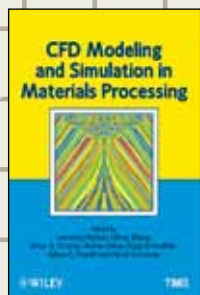
Author Signing Hours:

Morris: Monday, March 12, 2 to 3 p.m.

Apelian: Tuesday, March 13, Noon to 1 p.m.

Cookies and coffee will be served!

*Discount available only at the TMS2012 Annual Meeting.



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University of Alabama – Tuscaloosa, USA

Past President:

George T. “Rusty” Gray III

Los Alamos National Laboratory, USA

Vice President:

Wolfgang Schneider

Hydro Aluminum Rolled Products GMBH, Germany

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Sandia National Laboratory, USA (Incoming)

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Stanley Howard

South Dakota School of Mines and Technology, USA

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University of Massachusetts, USA (Incoming)

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Neville Moody

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TMS 2012
141st Annual Meeting & Exhibition

26th EXHIBITION

March 11-15, 2012 • Swan & Dolphin Resort
Orlando, Florida

Exhibit Hours

Monday, March 12.....	12 p.m. - 6:30 p.m.
Tuesday, March 13.....	10:30 a.m. - 6:00 p.m.
Wednesday, March 14.....	10:30 a.m. - 3:00 p.m.

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TMS 2012

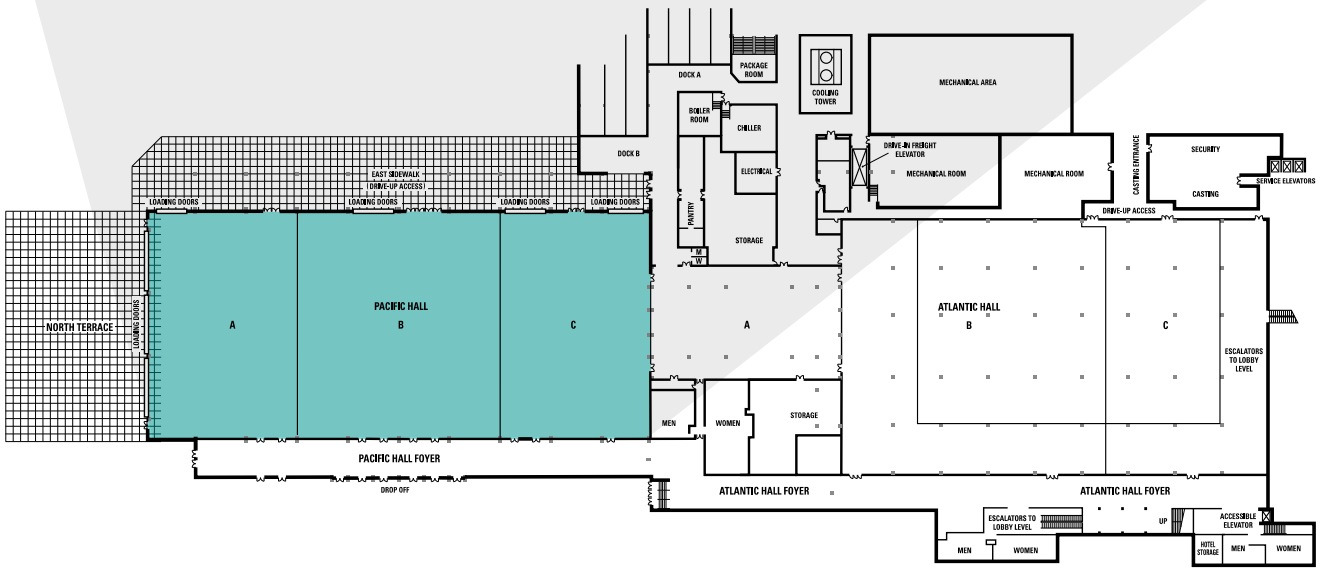
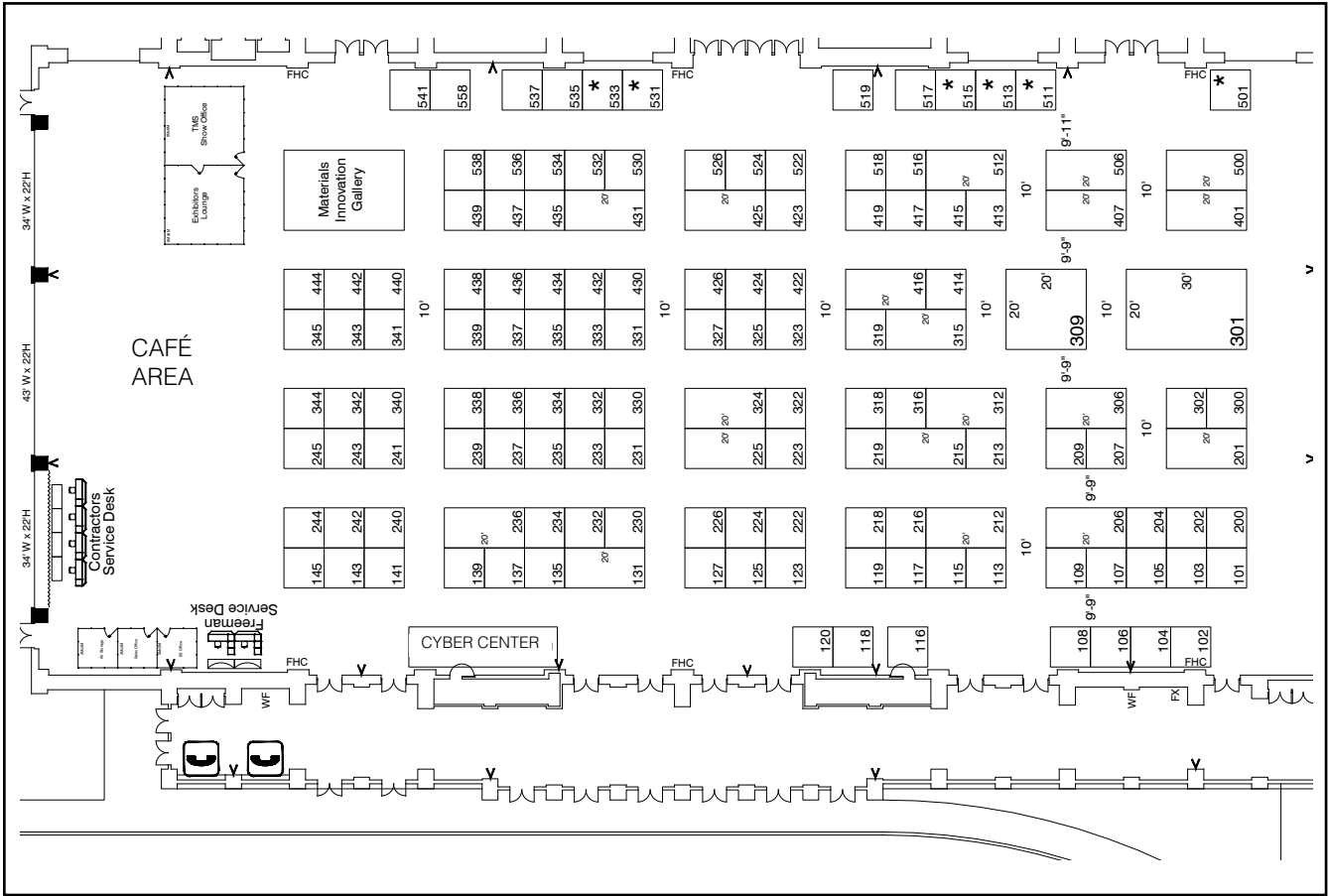
141st Annual Meeting & Exhibition

Exhibiting Companies

(as of January 30, 2012)

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A global leader in equipment and services for the power generation, power transmission and rail transport markets, Alstom has placed sustainable growth at the centre of its strategy, by developing innovative, environmentally friendly technologies. Each day, Alstom's employees, spread throughout more than 70 countries, work to make our future better.

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We are Shaping the future





Company Descriptions

ABB Inc.

Booth #300

ABB Analytical Measurements 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 39 years of experience in analytical instrumentation, ABB has established itself as a worldwide leader in inclusion and hydrogen measurements in liquid aluminum. The company offers a complete range of analytical solutions to the aluminum industry: AISCAN™ hydrogen analyzer, LiMCA inclusion analyzer, Prefil®-Footprinter melt cleanliness analyzer, PoDFA inclusion identification and quantification analysis. ABB also offers metallographic analysis service for its customers.

Across International

Booth #113

Founded and based in New Jersey, United States, Across International supplies crystal substrates, laboratory equipment, in the area of heat treatment and material processing for universities, research facilities and labs. We have more than 15 years of industrial manufacturing experience in drying ovens, ball mills, lab furnaces, pellet presses and pressing dies.

Our goal is to build up business partnerships with friends around the world. We provide quantity discounts and will reply to your requests within the same business day; 100% customer satisfaction is always our first priority.

Advanced Dynamics Corp., Ltd.

Booth #101

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.

Advanced Scientific Technology & Management Research Institute

Booth #226

Almeq Norway AS

Booth #506

ALMEQ Norway AS is an engineering and marketing company for a wide range of equipment and services to aluminium smelters worldwide.

The long term objective for the company is to be a leading supplier of own equipment as well as an export marketing partner for other well accepted manufacturers of machines and equipment for the primary aluminium smelters worldwide.

Aluminium International Today

Booth #105

Aluminium International Today is the aluminium industry's leading international publication reporting on aluminium production and processing. Founded in 1989, it provides a wealth of technical features aimed at equipping producers and processors with information on latest developments. Added to this is a digest of industry news, contracts, events, new technology 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. E-mail aluminium@quartzltd.com and visit www.aluminiumtoday.com.

AluminiumNetwork.com

Booth #417

A Global Network for the Primary Aluminium Industry, AluminiumNetwork.com is your internet-based portal to supply and support you with a wide range of services; your meeting place with like-minded partners who can assist in improving your business and accelerate your project.

The main focus of aluminiumnetwork.com is the primary aluminium industry and it is aimed particularly at:

- Primary producers
- Suppliers of raw materials or intermediates
- Equipment suppliers
- Providers of services, including consulting services and project support.

The AluminiumNetwork.com Consultants / Freelancers database is the perfect source for independent expertise in all of the engineering disciplines, from alumina through to primary aluminum production, including all the support functions of the process. By providing a global platform, AluminiumNetwork.com is THE place to meet with Consultants and Freelancers within the primary aluminum industry. The clients of AluminiumNetwork.com will have access to the Consultants and Freelancers database and will be able to select their required need by qualification and skills.

Please visit www.AluminiumNetwork.com for detailed information.

Company Descriptions

Astrium North America

Booth #333

Astrium North America is a U.S. based company specializing in program and project management, software engineering, external carrier development and integration services, experiment and payload processing, life and physical sciences hardware and flight simulation and training for the international space community.

ATR

Booth #316

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://atrnsuf.inl.gov>.

AUMUND Foerdertechnik

Booth #501

With their proven track record in materials handling and storage from mineral processing to hot materials handling the AUMUND Group offers engineered and cost effective solutions for the primary aluminium production process.

Controlled cooling and clean handling of bath material in the primary aluminium smelting process with the AUMUND Cooling conveyor for hot bath material:

- 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

AUMUND's head office is located in Rheinberg, Germany. E-mail at metallurgy@aumund.de. Contact Person/Designation: Matthias Moritz / General Manager

Beijing Antaike Information Development Co., Ltd

Booth #332

Beijing Antaike Information Development Co., Ltd, relying on the industrial status and background of China Non ferrous Metals Industry Information Center, focuses on researching and analyzing the production, consumption, market, management, and industrial policies of non ferrous metals industry and uses the information within the industry to push forward the overall development of the industry. We provide information and consultancy services for global metals markets, and the construction of enterprise information technology as well as their brand promotion. 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.

Big C: Dino-Lite Scopes

Booth #340

Big C offers the Dino-Lite Portable Digital Microscope, which provides high-quality microscopy video interfacing to PC and MAC with clear and steady imaging and 10X–200X magnification. The included software "DinoCapture" makes it easy and convenient to take snapshots, record videos, manipulate images, and save and e-mail discoveries. It is a single lens device with diverse applications.



Company Descriptions

Boreal Laser Booth #319

Boreal Laser makes GasFinder laser based toxic and hazardous gas detectors that are used in a variety of open path (ambient, environmental and safety), stack, vent and process monitoring applications. Portable GasFinders are light, battery operated and easy to set up and use. Multiple path/point GasFinder MC systems can monitor up to eight paths or points with a single analyzer. Both portable and fixed GasFinders are self-calibrating, robust, reliable and maintenance free. GasFinders benefits also include fast one second response, lack of interference from other gases and low cost of ownership. GasFinders are currently available for hydrogen fluoride (HF), hydrogen chloride (HCl), hydrogen sulfide (H₂S), ammonia (NH₃), methane (CH₄), carbon dioxide (CO₂), hydrogen cyanide (HCN), ethylene (C₂H₄) and acetylene (C₂H₂). Typical applications include Aluminum smelting, Refineries (esp. HF Alkylation), Petrochemical and Chemical Plants, Gas Production and Processing, Green House Gas applications, plus Bricks and Ceramics.

Brochot

Booth #200

Brochot SA is the descendent of a very old industrial company going back to the early 19th Century. The Brochot family remained the owners until 1986, when it was bought by its present management.

During the years 1986 to 1992 the new owners were to develop the firm both internally and by external acquisitions along two lines:

- Increasing its sub-contracting work, a thriving activity at the time
- Developing the range of equipment for the production of primary aluminium BROCHOT concentrated on developing and rounding out its know-how in the design and building of special equipment for industry, in the automated "mechelle mechanical" area.

Despite having skills and references in other sectors, such as the motor and railway and printing industries, for several years BROCHOT has, for several years seen the bulk of its turnover come from companies producing primary aluminium and magnesium.

Buss AG

Booth #116

Buss AG is an established Swiss manufacturer of value-added mixing and kneading systems for various applications.

The genuine Buss Kneader technology, developed by Buss AG in 1945, has meanwhile made its mark in the aluminium and other industries. Today, more than 2500 BUSS Kneaders are in operation worldwide, 250 thereof in the continuous production of carbon pastes.

For nearly 60 years, the Buss Kneader has been the benchmark for reliable and cost-effective mixing of anode pastes. Now Buss AG is proud to present a new Kneader generation, the four-flighted KX series, designed for even more intensive mixing and micro-dispersion at considerably higher output rates and lower investment cost.

The genuine Buss Kneader technology is the best choice for a reliable low production cost and customer approved production of high quality anodes.

Buss ChemTech and Laeis

Booth #431

Buss ChemTech AG (BCT):

as the world leader in equipment supply and technologies for the aluminium industry based on 60 years experience, offers high developed and fully dedicated applications for Anode manufacturing and Aluminium Fluoride production, covering:

- Modular and fully continuous running Green Anode Plants, e.g. the KAS Carbon Plant in Pavlodar
- Pitch Melting Plants based on unique, highly efficient function incl. appropriate storage
- BCT Paste Kneader with latest major improvements, the most efficient paste preparation application
- Coke Preheater, Paste Cooler and Hydraulic Anode Press integrated to the process

BCT is providing original parts and worldwide on-site support for all maintenance, operating and process aspects to ensure you an efficient and reliable production.

Since September 2011, Buss ChemTech is joining KRESTA Industries, a private owned industrial group with 700 employees, own fabrication facilities and full EPC services. A further step to successfully serve our customers with guaranteed solutions.

www.buss-ct.com

LAEIS GmbH:

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.

www.laeis.eu

Company Descriptions

CA Picard International

Booth #415

C.A. PICARD is specialized in manufacturing of high quality wear parts for continuous kneaders for the manufacture of green anodes for the primary aluminum industry.

PICARD manufactures kneading teeth, wearing plates / liners and screw flights out of high wear resistant qualities.

Chongqing Runji Alloy Co., LTD. / Okaya (U.S.A.), Inc

Booth #323

We specialize in producing all kinds of alloying tablets. We are continuing to improve, modernize and expand our company's production capacity in order to increase productivity and efficiency. Our acquisition of the largest Mn ore mines in Jingxi County, Guangxi province of China, has increased our capacity to more than 3 million tons and our new production line of Mn flakes has also been completed with an annual capacity of 30,000 tons. With the development of these programs along with our state-of-the-art production management, technologies and facilities, we can guarantee enough raw material supply at very competitive price levels while maintaining our high level of quality.

Information about our partners: Okaya (U.S.A.), Inc. is an international trading house that provides representation in North America for Chongqing Runji Alloy Company, LTD. This partnership is an example of Okaya's expansion of our business domain from its core area of iron and steel to various related fields of business. We can also perform marketing, logistics and processing functions to fulfill our role as the "Best Global Sourcing Partner". As an independent trading company with a high level of flexibility, Okaya will continue to propose insightful and creative business opportunities by looking at various areas with a broad perspective. Also visit us online at www.okaya.co.jp/en



TMS 2012 MARCH 11-15, 2012 • ORLANDO, FL
141ST ANNUAL MEETING AND EXHIBITION

CARBONE SAVOIE
LEADER IN CATHODIC SOLUTIONS FOR THE ALUMINIUM INDUSTRY

 CARBONE SAVOIE

The banner features a woman on the left, a cityscape with a large building in the center, and a stylized sunburst background. The text is prominently displayed in the upper and lower portions of the image.



Company Descriptions

CIMM

Booth #426

As the company certified by ISO9001:2008 and international projects contractor accredited by P.R.China, CIMM GROUP is a healthy and fast growing integrated multinational corporation professionally engaged in providing technology, engineering, manufacturing, trade and EPC service in fields of aluminium and steel, minerals, metals and metallurgy, cement and construction, refinery and petrochemical, ports and shipyards, oil and gas, power generation and transmission, green resource, and energy, etc.

CIMM GROUP is also the leading raw material and equipments supplier for aluminium smelters. Some of the products are aluminium fluoride and cryolite, anode, cathode, silicon metals, refractory, insulation bricks, silicon nitride bonded silicon carbide blocks, CPC, aluminium tablets, etc. and some of equipments are Pot Tending Machine, Stacking Crane, Furnace Tending Assembly, Aluminium Ladle cleaning Machine, Vibration Machine, Anode Clamp, Crush Breaker and assorted Spare Parts, etc., which have been supplied to overseas markets to establish good and steady relationships with Australia, Brazil, India, Russia, Middle East, Kazakhstan, Europe, USA, etc. The supplied products have a great reputation among our customers. CIMM GROUP is always committed to be a trustworthy business partner.

Claudius Peters

Booth #318

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.

CMI Novacast Inc

Booth #131

CMI Novacast Inc. is a privately held company founded in 1972 as Cast Metals International by Paul R. Gouwens. At that time, it was a consulting firm endeavoring to introduce new technologies to the United States from foreign countries. One of the companies introduced was GAAA of Lyon, France. GAAA was in the business of producing electromagnetic pumps for metering of molten metal.

GAAA opened an office in Elk Grove Village, Illinois, in 1973 to service the North American market. GAAA was purchased by Novatome in 1978, and in 1981 the French government nationalized Novatome with the requirement that all work in aluminum cease. At that time, Cast Metals International changed its name to CMI Novacast Inc. and took over the production and sale of the pumps as designed by Novatome.

CMI Novacast's commitment to all customers is to deliver the most reliable, predictable, and high-performance low pressure or gravity casting system in the industry.

Colt International

Booth #104

Colt is a global supplier and manufacturer of natural and mechanical ventilation systems.

The principal activity of Colt is the supply of specialist products and systems in the field of building services with particular emphasis on gravity ventilation and the environmental control of industrial and commercial buildings. Especially for the aluminum industries, Colt is supplier of

- Static Roof Ventilators for reduction area and anode bake building
- Controllable Air intake louvers for air intake in the basement of reduction, anode bake buildings and cast houses
- Claustra Wall , manufactured from reinforced fiber plastic
- Pot hoods/covers for pots.

MISSION STATEMENT: Our vision is to make the world a better place in which to live and work by helping to make the environment associated with buildings healthy, safe, productive and comfortable.

CompuTherm LLC

Booth #518

CompuTherm, LLC, expertise in thermodynamics and kinetics, develops computational tools for industrial applications in the broad field of materials science and engineering. The products of CompuTherm include the Pandat software and thermodynamic databases for numerous alloy systems, such as Al-, Ni-, Ti-, Mg-, Fe- based alloys. These products are currently used by hundreds of users worldwide. Pandat is a powerful software package for the calculation of multi-component, multi-phase equilibrium and related properties. In addition to the phase diagram calculation and optimization modules,

a precipitation module and a diffusion module are currently being developed in the framework of the Pandat software. In the past 15 years, CompuTherm has collaborated with academic and industrial partners and has worked on many government-sponsored projects. CompuTherm also develops tailor-made software and databases for specific applications, provides consulting services to materials industries and collaborates with other institutions working on challenging programs with potential commercial payoffs.

Company Descriptions

CSM Instruments

CSM Instruments has been leader in the development of instruments for advanced materials testing for over thirty years.

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 Instruments manufactures standalone instruments as well as testing modules that can be combined together on an automated platform.

Additionally, we have a thorough sample testing service and demonstration laboratory in Boston, MA where you can send us your samples for evaluation or take a firsthand look at our instruments.

Booth #231

Cytec Industries, Inc.

Cytec collaborates with mining companies to optimize their operations through the delivery of innovative chemical technologies. We utilize our superior application expertise to develop solutions based on our customer's specific needs. We offer technologies that:

- Decrease the cost of operations
- Provide better recovery and selectivity
- Process difficult ores
- Prevent or limit employee's exposure to hazards
- Optimize the use of natural resources
- Minimize waste and re-tooling
- Do not require on-staff scientists or engineers

Cytec is committed to partnering with our customers to meet their needs. Our network of technical staff provides on-site technical assistance worldwide. We are dedicated to on-time delivery, even to the worlds harder to reach areas. Our unique approach to servicing our customers has made Cytec the leading provider of reagents to the mining industry.

Booth #512




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Company Descriptions

Daifuku Webb Co/Webb Aluminum

Booth #312

Daifuku Webb Company is a recognized leader in the field of engineered material handling systems and equipment. Our full line of integrated material handling products are computer controlled to efficiently automate rod/anode assembly, and green or baked anode operations.

Our product line includes:

- Automatic Guided Vehicles
- Power and free conveyors
- Roller conveyors
- Heavy-duty chain conveyors
- Automated Storage and Retrieval Systems
- Custom designed automation equipment

From raw materials handling and transport to anode, molten metal, and cast ingot handling to automated storage of work-in-process and finished product, Daifuku Webb Company has nearly 50 years of material handling and control experience in the Aluminum Industry.

Danieli Corus Technical Services

Booth #115

Using proven technology, Danieli Corus helps clients in the primary metals industry achieve maximum performance. We bring reliability, economic benefits and minimized emissions to aluminium producers world-wide.

Based on specialized know-how and vast experience, Danieli Corus offers engineering and contracting services as well as consultancy at all levels of development. Danieli Corus is a client-focused, solutions-driven company. It offers an integrated approach to all aspects essential to success in an increasingly competitive global industry.

Danieli Corus provides efficient, cost-effective and versatile scrubbing technologies for the aluminium smelting industry. We are best known for our proprietary dry scrubbing technology, incorporating the patented vertical radial injection (VRI) system, for the control of emissions from potlines, carbon anode baking furnaces and green carbon plants. Danieli Corus also commissioned the two largest wet scrubbers ever built at an aluminum smelter for the reduction of sulfur emissions from the potlines.

Today, based on our proprietary dry scrubbing technology and our versatile wet scrubbing technology, numerous fume and gas treatment plants have been built for primary aluminium smelters around the world.

Dubai Aluminium Co., Inc.

Booth #517

Dubai Aluminium ("DUBAL") owns and operates one of the world's largest single-site primary aluminium smelters. The DUBAL complex, built on an 480-hectare site in Jebel Ali, Dubai, comprises a one million mtpa smelter, a 2,350 MW power station (at 30°C), a large carbon plant, extensive casting operations (1.267 million mtpa), a water desalination plant and other facilities.

High quality aluminium products are made in three main forms: foundry alloy for the automotive industry; extrusion billet for construction, transport and industrial applications plus billets for forging processes in automotive industries; and high purity aluminium for the electronics and aerospace industries. More than 300 customers are served in at least 45 countries worldwide, predominantly in the Far East, Europe, the ASEAN region, the MENA region and North America. A quality-focused, customer-centered and innovation-drive organization, DUBAL holds ISO 9001, ISO/TS 16949, ISO 14001, ISO/IEC 27001, ISO/IEC 20000-1, and OHSAS 18001 certification.

DUBAL also owns 50% of Emirates Aluminium ("EMAL") in Al Taweelah, Abu Dhabi, where Phase I with a smelter capacity of 750,000 mtpa was fully commissioned by the end of 2010. EMAL Phase II is currently under construction. With a view to securing its alumina requirements, DUBAL has invested actively in greenfield bauxite/alumina projects in Republic of Guinea, Brazil, Cameroon and India. These projects are in various stages of development.

DUBAL's in-house developed, proprietary reduction cell technologies, DX Technology and DX+ Technology (operating at 380 kA and 420 kA respectively), currently rank among the best reduction technologies available. DX Technology has already been installed at industrial scale at DUBAL (40 cells) and EMAL Phase I (756 cells); while DX+ Technology has been specified for EMAL Phase II (444 cells).

EBSD Analytical

Booth #233

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 16 years experience in EBSD, you can trust that the results we provide will be of the highest quality.

Company Descriptions

EDAX Inc.

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).

EDAX's two TEAM™ analysis systems, TEAM™ EDS and TEAM™ Pegasus are both easy to use and offer Smart Features, which provide analytical intelligence to enable users to easily obtain exceptional results. TEAM™ EDS is the industry's most advanced EDS Analysis System. The newly released TEAM™ Pegasus is a world class materials characterization solution, providing users with both crystal structure and elemental composition results in one easy-to-use EBSD/EDS package. In addition the Orbis micro-XRF elemental analyzer provides small and micro-spot analysis and mapping.

EDAX also offers camera and detector solutions to meet all your analysis needs.

EDAX develops the best solutions for micro- and nano-characterization, where elemental and/or structural information is required, making analysis easier and more accurate. www.edax.com

EGYPTANODE

EgyptAnode is a merchant coke calcining and baked carbon anode production facility, aiming to produce high quality carbon materials to be used in the aluminium industry worldwide. EgyptAnode is set to build its own calciners as a 1st phase of its project, with a 300,000 MT capacity of high quality calcined coke (Anode & Fuel grade) with start-up scheduled in 3rd Quarter 2013, while the anode production is scheduled to be in 2015.

The facility is located in Suez, Egypt, on the Southern entrance of the Suez Canal, on the Red Sea, and a short distance from Egypt's Mediterranean ports, giving it an ideal location to the Middle East market, Europe, and the Americas.

Eirich Machines, Inc.

Eirich Machines designs, manufactures and supplies batch and continuous machinery and systems for the processing of raw materials, compounds, waste and residues in a wide range of industries. Our complete line of products for mixing, agglomerating, pelletizing, grinding, granulating and plasticizing range from laboratory size units to 250 ft³ capacity machines. Eirich High Intensity Mixers 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.

Booth #218

Energoprom Group

Energoprom Group is one of the most efficient companies of non-raw material sector of the Russian economy, runs business globally and supplies more than 50% of its production to the world market.

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

The main activity - production of high technological electrode, cathode and other carbon and graphite products for steel, aluminum, ferroalloy, silicon, chemical, nuclear and engineering industries.

The Group includes five companies: NovoCherkassk, Novosibirsk, Chelyabinsk Electrode Plants, Doncarb Graphite and Aviauglerod, which are located in close proximity to consumers.

Farra Engineering, Ltd.

Farra Engineering is a New Zealand based company that in conjunction with aluminium smelters in New Zealand and Australia has developed two machines to increase efficiency and safety in the carbon bake plants.

The Pit Maintenance Unit (PMU) provides easy and safe access to the bake pits for routine maintenance, utilizing one or two traversing cages that lower down into the pits. The unit can service up to 8 pits before simply relocating via the overhead crane and the beautifully balanced single point lifting attachment on the unit. To complement this we have developed a Flue Wall Building Station (FWBS) that allow tradesmen to safely and efficiently build the brick flue walls from an elevated platform, utilizing four interconnected rack and pinion drives to keep the flue wall rock steady and perfectly level. The wall drops down after every completed row of bricks and once fully completed it is easily removed for subsequent installation in the bake pits.

Our PMU's are installed in most recent new builds including Qatalum and Emirates Aluminium in the Middle East and the FWBS in the Hydro smelter at Kurri Kurri in Australia.

Booth #522

Booth #202

Booth #526



TMS 2012

141st Annual Meeting & Exhibition

Company Descriptions

Fives Solios

Booth #407

FIVES SOLIOS is one of the companies of Fives, a major International Group, with considerable experience in industrial engineering and management of large projects all over the world. Fives Solios is specifically dedicated to the Aluminium Industry and develops innovative solutions in order to comply with more and more stringent environmental standards while increasing safety and reliability. Fives Solios most particularly works on reducing energy consumption in its process technologies.

- Reduction: Gas Treatment Centers on electrolysis pots and Bath Processing Units.
- Carbon: High Capacity Green Anode Plants, Pitch storage and processing, Liquid Pitch Marine Terminal, Firing & Control Systems for anode baking furnaces, and Fume Treatment Centers on anode baking furnaces.
- Casthouse Area: Melting and Holding furnaces including water cooling systems as well as integration of downstream casting machines, Heat Treatment furnaces for rolling mills and associated control systems.
www.fivesgroup.com

FLSmidth

Booth #225

FLSmidth is your major equipment supplier from Bauxite Mining and Refining through Calcination and Smelting. Every day, worldwide, our equipment crushes, conveys, grinds, digests, clarifies, precipitates, stores, and calcinates bauxite to produce alumina. Combining the respected brand names of MÖLLER, KOCH-MVT, FULLER-TRAYLOR, WEMCO, EIMCO, DORR-OLIVER, PNEUMAPRESS, KREBS, ABON, RAHCO, CEntry, Conveyor Engineering and Raptor, FLSmidth offers a broad range of equipment and processes while increasing recoveries, lowering energy consumption, and providing proven reliability. We also offer metallurgical testing utilizing the expertise of FLSmidth Dawson's metallurgical laboratories. FLSmidth is your One Source, One Partner providing integrated solutions that will save you valuable time on your project schedule!

2012 EXHIBITION DIRECTORY



Solid leadership in a constantly *changing* world.

With a global reach spanning six continents, Koppers is a leading integrated producer of carbon compounds and treated wood products essential to many world industries.

True leadership begins with Koppers employees. We embrace safety, health, environmental stewardship and personal integrity in everything we do and in every product we produce. We give back to our communities in so many ways and we don't just talk sustainability, *we live it.*

To learn more about our standards of leadership, visit us at www.koppers.com.



436 Seventh Avenue Pittsburgh, PA 15219-1800
www.koppers.com

Company Descriptions

Gannon University

Booth #139

Founded in 1925 in Erie, Pennsylvania, Gannon University is a comprehensive Catholic institution that encourages the professional and personal growth of its students through a holistic education. Gannon University offers an Online Master's in Engineering Management (MS-EM) degree designed to help professional engineers put their careers on track for increased responsibility as an engineering manager or project director. The online engineering management program curriculum blends the best in advanced engineering studies and advanced coursework in business. Engineering professionals who complete Gannon University's MS-EM are poised to assume additional leadership responsibilities to advance their career.

Gautschi Engineering GmbH Booth #212

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

GE Aviation

Booth # 207

GE Aviation is the world's leading producer of large and small jet engines for commercial and military aircraft. We also supply aircraft-derived engines for marine applications and provide aviation services. GE Aviation's technological excellence, supported by continuing substantial investments in research and development, has been the foundation of growth, and helps to ensure quality products for customers.

GES

Booth #219

GES, supplying quality graphite to various industries for over 25 years, represents some of the leading graphite producers worldwide. The fine grain extruded, molded and iso-molded grades cover three distinct grain sizes. Offerings include cathode blocks, rods for molten metal pump shafts and support posts, large block for pump bases, and rounds for rotor heads. GES provides competitive pricing, technical support, and convenient warehousing to meet your needs. Our Technical Sales personnel will be available in our booth to discuss your application and which grades will meet your requirements.

Gillespie + Powers, Inc.

Booth #324

A Corporation engaged in the design, supply, installation, and maintenance of industrial aluminum melting and process furnaces, refractory systems, acid-proof construction, and specialty refractories, as in waste incineration.

GLAMA Maschinenbau GmbH

Booth #201

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
- Hammer Crustbreakers
- Tapping Trucks
- Anode Pallet Transporters
- Furnace Charging Machines
- Furnace Tending Machines
- Ladle Charging Trucks
- Butt Cleaning Manipulators
- Coil Lift Trucks
- Molten Metal Carriers

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, Inc.

Booth #103

A comprehensive range of equipment and unsurpassed reliability and efficiency are at the heart of GNA alutech's success. Leading aluminum works all over the world rely on GNA alutech products and technologies, proof of the company's capacity to respond to the multiple needs and stringent requirements of its clients.



Company Descriptions

Goodfellow Corporation

Booth #341

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.

Visit Goodfellow Corporation at website: www.goodfellowusa.com or e-mail info@goodfellowusa.com

Gouda Refractories

Booth #414

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.

Guangxi Bama Zhengyu Titanium Industry Co., Ltd

Booth #209

Guangxi Bama Zhengyu Titanium Industry Co., Ltd is a professional manufacturer of Aluminum master alloys and Aluminum alloying additives in China. We always take innovation as the power of development. We are highly professional, well educated, diligent and full of vigor. In principle of good honesty, equality and mutual benefits, we always keep the modest and prudential attitude, develop more new products, make more friends globally, and provide our customers with qualified products and good service.

Harper International

Booth #236

Harper International is a global leader in complete thermal processing solutions, as well as technical services essential for the production of advanced materials. Harper serves advanced, cutting-edge material markets with custom-engineered thermal processing systems. Our support to these emerging industries begins in early stages of research and development, whether at corporate R&D centers, universities, government institutions, or start-ups. Harper is a partner through the entire development process assisting in the scale up and commercialization of advanced materials that will change our everyday lives. One thing you won't see at Harper is a cookie cutter line of products that we work to fit into your requirements. We specialize in first-of-a-kind solutions using our exceptional depth and breadth of knowledge. Harper's culture is one of real ingenuity and creativity – we are constantly challenging ourselves to craft the best-engineered technology solutions for our customers' needs.

Company Descriptions

Hencon BV

Hencon provides a complete range of heavy duty vehicles and vacuum technology solutions for aluminium smelters, aluminium foundries, light metal producers, industrial plants and mining applications. Originally a Dutch company, we developed a broad experience in the supply of solutions for customers in the light metal industry. With our solutions we want to make the difference for our customers and commit ourselves to measurable cost savings. Therefore we design machines that are safe to use and easy to operate and maintain. While at the same time our company is committed to offering you the support you require to make your business a success.

We think global and act local. This resulted in the unique concept of business units of Hencon on your doorstep: such as our service and production plants in the Netherlands, Russia, South Africa, Mozambique and India up to today.

Our goal is to offer our customers solutions to enable them to strive for continuous operating excellence in the lower cost curve of the industry.

With Hencon, you select a partner who has over 55 years of experience in the industry. We translate this knowledge into a durable partnership that shows commitment, creativity and entrepreneurship, in order to make our customers excel.

Whenever you would have questions about vacuum technology solutions, transport equipment and plant logistics; feel free to contact us for:

- Feasibility studies
- Know-how and analyses
- Training
- Support
- New equipment
- Maintenance solutions

Hencon offers tailor-made solutions with a clear eye for your specific needs and production processes. Combined with our know-how, we make the difference with solutions that offer you value for money.

Our clients can be found worldwide in the following countries: Argentina, Australia, Bahrain, Belgium, Brazil, Canada, China, Czech Republic, Denmark, Egypt, France, Germany, Greece, Hungary, Iceland, India, Indonesia, Cameroon, Mexico, Montenegro, Mozambique, Netherlands, New Zealand, Norway, Oman, Poland, Qatar, Romania, Russian Federation, Saudi Arabia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, United Arab Emirates, United Kingdom, United States of America and Venezuela.

Booth #102

Hysitron

As world leader in nanomechanical test instruments, Hysitron is dedicated to providing next-generation testing solutions for nanoscale mechanical characterization. Hysitron's nanomechanical test instruments provide in-situ SPM imaging in addition to the quantitative measurement of multiple mechanical properties, including hardness, modulus, fracture toughness, interfacial adhesion, and wear resistance. Our instruments feature a full suite of advanced complementary techniques, including nanoDMA® III to continuously obtain elastic-plastic and viscoelastic properties of materials as a function of indentation depth, frequency, and time. Additional Hysitron hybrid techniques include nanoECR® for simultaneous electrical and mechanical property measurements, Modulus Mapping for high resolution property mapping, and elevated temperature testing to determine material properties at operating or processing temperatures. Stop by our booth to see how the industry-leading TI 950 TriboIndenter redefines the world of nanomechanical testing. Hysitron will also be showcasing the PI 95 and PI 85 PicoIndenter®, truly quantitative depth-sensing indenters capable of in-situ observation during testing inside a TEM and SEM.

Booth #416

ICE Publishing

Booth #500

ICE Science is the new flagship journal collection from ICE Publishing inspiring fresh thinking on how breakthrough research can be practically applied to make energy, materials and medicines ever more efficient and effective. Launching with a series of full-color, bi-monthly journals in 2012, the collection aims to deliver a truly holistic overview of each scientific discipline, bringing together communities that traditionally work in silos to ensure important discoveries and applications are accessible to all those in the field. The first two editions of 'Bioinspired, Biomimetic and Nanobiomaterials', 'Emerging Materials Research' and 'Nanomaterials and Energy' are available free on our booth.

ICE Publishing is the publishing division of the Institution of Civil Engineers (ICE). We produce a wide range of publications sharing expert advice, leading research and best practice. With a history of making research in engineering and allied sciences practically useful since 1836, we offer a unique breadth of experience.



Company Descriptions

InfoSol Inc.

InfoSol is a leading provider of Business Intelligence solutions. With an in-house product development team and partnerships with other leading Business Intelligence solutions providers around the world, InfoSol offers the "best in class" and most innovative add-on solutions. These solutions include InfoBurst for Automated Report and Dashboard Bursting/Publishing, along with Intelligent Cache Query for optimal Xcelsius dashboard performance and scalability.

Having more than fifteen years experience in providing end-to-end Business Intelligence applications, InfoSol sees beyond the data to deliver visionary solutions that inspire.

Innovatherm GmbH + Co., KG

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

Booth #224

International Aluminium Journal

Booth #235

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. Published by Giesel Verlag GmbH; visit www.alu-web.de and www.giesel.de.

Jordan Valley Semiconductor

Booth #107

Jordan Valley is the leaders in X-ray metrology for semiconductors and thin films, with a range of products to suit all needs. Our products range from fully automated systems for specialist semiconductor fabs (JVX range) through to diffractometers for compound semi manufacturers (QC3, QC-Velox and QC-RT) and state of the art general research diffractometers (D1).

With the acquisition of Bede Scientific in 2008, Jordan Valley has over 30 years experience in a wide range of X-ray metrology methods including X-ray diffraction (XRD), X-ray reflectivity (XRR), high resolution XRD (HRXRD), X-ray Fluorescence (XRF) and X-ray topography (XRT). The systems are designed to be simple to use yet powerful enough to perform the most demanding measurements. Automation of the alignment, measurement and analysis is available on all systems to remove the necessity of highly trained operators being required for routine measurements. The simulation software (RADS, REFS) is generally regarded as the industry leader for HRXRD and XRR analysis.

Jordan Valley systems are installed in major semi manufacturers production lines, R&D labs, LED manufacturers, GaAs and InP production lines as well as many universities and research institutes worldwide.

Company Descriptions

Kempe International

Booth #315

Kempe is the largest provider of asset and maintenance services in the aluminium smelting industry and has the most extensive product range for the aluminium smelting industry and is one of the top five global suppliers.

Kempe is currently supplying the Anode Rodding Shop and Anode Handling System for Ma'aden Aluminium and the Bath Treatment Plants for Hindalco Mahan & Aditya Smelters. We have recently installed the CBF4 Anode Handling & Transfer System at Boyne Smelters.

Kempe works for 30 smelters in 21 countries across 7 regions – Australasia, Middle East, Africa, Asia, Europe, North America, and South America. Kempe has in-house manufacturing in Australia, China, UAE & Mozambique.

Kempe has more than 2,000 employees globally, which includes in-house construction crews & equipment.

Kempe will be available at TMS to discuss potential client requirements in the various areas of aluminium smelting including – Anode Handling & Cleaning, Rodding Shops, Bath Removal (hot & cold), Bath Cooling & Processing, and other Carbon, Potroom and Casthouse equipment.

Light Metal Age

Booth #216

Light Metal Age is the pre-eminent magazine of the light metal world. In 2012, we are pleased to celebrate our 70th anniversary of publication, covering primary production and semi fabrication of the light metals aluminum, titanium, and magnesium. Circulation is international and goes to primary and secondary smelters; casthouses; extrusion operations; rolling mills; sheet, rod, and wire mills; and foundries. Coverage of associated metal processes and equipment includes DC casting, surface technologies such as anodizing, furnaces and melting, degassing and filtration, automation and instrumentation, and handling. Recipients are executives, general managers, plant managers, technicians, metallurgists, chemists, and engineers responsible for fabrication, production, and operations.

Light Metal Age also produces select article archive content on CDs, including the Titanium Article Archive (Nov. 1945 – Aug. 2009) and the Magnesium Article Archive (May 1943 – August 2011), as well as the Aluminum Extrusion Article Archive (July 1943 – April 2011). For more information, visit Light Metal Age on the web at www.lightmetalage.com.

Linde LLC

Booth #120

Linde, a leading global industrial gases company, provides industry-leading portfolio solutions for the aluminum industry ranging from gases and equipment to process consulting and services. These solutions enable our customers to increase productivity, lower fuel consumption and other costs and reduce emissions.

We offer dedicated applications for every step in the aluminum process chain, all designed to help you reduce fuel consumption and emissions, and improve quality:

- Low-temperature oxyfuel melting technologies to increase the melt rate, cut energy costs and reduce emissions
- Refining to improve the quality of the final product by purging the melt with gases to remove hydrogen, non-metallic inclusions and unwanted trace elements
- Heat treatment in the form of annealing in a protective nitrogen atmosphere to reduce oxidation and discoloration
- Extrusion cooling and shrouding with liquid nitrogen to raise production rates, improve surface finish and increase die lifetime.

LP Royer, Inc.

Booth #204

For all workers in the metallurgical industry, L.P. Royer is your "one stop" supplier for specialized and innovative safety footwear since 1934, visit us and see "THE SMELTER BOOT". The XSPAN® soling technology, unique to L.P. Royer in North America, adds to the mix to bring you a lighter dual density rubber sole that protect from heat and extreme cold and offer superior traction, shock absorption and durability. With our wide range of adapted protection including internal and external metatarsal protection, nonmagnetic toe protection you will find the best style for you. L.P. Royer products meet CSA, ASTM CE marking quality standards.

Maney Publishing

Booth #232

Maney delivers a personalized service to authors, societies, readers and libraries for the publishing and international dissemination of high quality, peer-reviewed scholarly research.

Specializing in print and electronic journal publishing, Maney is committed to technical and editorial innovation combined with traditional values of quality and collaboration.

Maney publishes an impressive collection of highly regarded, peer-reviewed journals covering both niche and general topics in materials science and engineering. Coverage ranges from fundamental research to engineering application and from the extraction and refining of minerals to the characterization, processing and fabrication of materials and their performance in service.



Company Descriptions

Materials Innovation Gallery Booth

#441

Welcome to TMS's showcase of ideas on how the techniques and principles that form the foundation for Materials Innovation @ TMS—the Society's exciting new strategic initiative—can revolutionize the design, development and deployment of advanced materials.

Browse the gallery of scientific and technical posters and displays that present "materials innovation in action." Network with individuals and companies who offer tools, support, and services that can enable you to implement these approaches within your own organization or team. Learn about the array of resources and opportunities that are being offered as part of Materials Innovation @ TMS. A special feature of the TMS 2012 Exhibition, the Materials Innovation Gallery will be open throughout the conference during regular exhibit hours, so stop by often!

Materials Innovation @ TMS is focused on significantly reducing the time and costs associated with materials development through the advancement of a seamless and dynamic innovation infrastructure that unifies and streamlines design and manufacturing processes. The Materials Innovation Gallery

has been designed to provide a visually compelling glimpse of how these concepts can potentially transform the future of materials and manufacturing innovation.

Mecfor Booth

#430

For the last 15 years, we have design and manufactured specialized equipment for the Aluminum production sector. We are present in many countries worldwide and part of the 4 or 5 worldwide manufacturers, thus the only one in America. Our main products are, crucible carriers, anode carriers, anode grooving, descaling robots, skimming stations, mobile equipment for loading, custom made specialized equipment.

Metallurgical & Materials Society of CIM

Booth #230

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

Anode Baking Furnace



- Refractory Bricks & Special Shapes (Low Creep 42% to 55% Al₂O₃)
- Heat & Air Setting Refractory Mortars
- Precast Prefired Monoblocks for Flue Walls
- Burner Blocks & Roof Anchors

Aluminium Melting/Holding & Reverberatory Furnaces


- Phosphate Bonded Non-wetting Bricks & Mortars (upto 85% Al₂O₃)
- Chemical Bonded Ramming Refractory for Repair Lining
- High Alumina Bricks & Mortars (42 to 60% Al₂O₃)
- Non-wetting Castables for Metal Contact Lining

Hot Metal Transfer Ladles

- Non-wetting Monolithics Lining
- Thermal Shock Resistant High Alumina Brick Lining

REFRACTORY SOLUTIONS FOR THE ALUMINIUM INDUSTRY




Aluminium Cast House

- Monolithic Lining for Degasser
- Wear Resistant Precast Prefired Shapes & In-situ Castables for Metal Conveying Line

Aluminium Pot Cell

- Dry Impervious Material
- High Strength Castable Material (Claycrete Al)
- Castable C 640
- Clayburn Bedding Mix

DRI-BARRIER MIX® INSTALLATION



30D, Jawaharlal Nehru Road, Kolkata - 700 016, India
Tel. : +91 33 2249 6507

Works : Ipitata Nagar, Dhenkanal - 759013, Odisha, India
Tel. : +91 6762 228071, 228928, E-mail : mktg@nilachal.in

www.nilachal.in

Company Descriptions

Micro Materials Ltd

Booth #432

Micro Materials Ltd (MML) - A wealth of mechanical property measurements in one instrument: The NanoTest Vantage system carries out a range of nanomechanical property measurements:

- Nanoindentation
- Nano-scratch and wear
- Nano-impact and fatigue
- Nano-fretting

Optimize material properties under true "in-service" conditions: The instrument can operate under a range of environmental conditions: high temperature up to 750 C, in liquids, and under non-ambient gases.

Unique capability: The high temperature testing module allows testing of a sample heated up to temperatures of 750 C. The patented MML nano-impact and fatigue system affords unrivalled information on fracture and fatigue behavior.

A trusted manufacturer: Established in 1988, MML's global customer base includes leading research institutes such as MIT, Cambridge and Oxford Universities.

Details from: Denise Hoban, International Business Development Director, denise@micromaterials.co.uk or www.micromaterials.co.uk

Moduloc Ltd, a Rotaloc company

Booth #434

- Engineered Solutions for the Metals Industry
- Industrial Sensors and Measurement Systems
- Laser Based Measurement Systems of hot or cold product for length, width or positioning
- Industrial Part Marking and Reading Solutions
- Digital Laser Level Counters
- Industrial Vision Systems
- Hot Metal Detectors
- Wireless Safety and Radio Remote Control
- Material Handling Solutions

MTI Corp

Booth #330

MTI Corporation, founded in 1994 by a group of material researchers from MIT and UC Berkeley, has now become the leading manufacturer of oxide crystals and substrates in the world, thanks to venture capital from Silicon Valley. MTI continues to develop new crystal substrates and maintain high quality of its single crystal substrates. MTI is equipped with the latest state of the art instruments, which allow achievement of the highest standard. We strive continuously to keep pace with customers' increasing demands on super-smoothness, super-flatness, and super-cleanliness. In 2000, by popular demand, MTI started to manufacture precision bench-top machines for material processing, analysis, and crystal wafer containers.

MTI currently operates three production factories in China. This allows for the possibility of providing high quality and low cost precision machines for material research and R&D Labs, including: low speed cutting saw, wire diamond saw, auto polishing machine, high temperature oven, tube furnace, X-Ray crystal orientation machine, and Mini XRD, as well as complete set of equipments for research of rechargeable battery materials. Simple to operate, low cost, and commitment to our customers is our priority. MTI strives to become the world's leader in bench-top machines for material lab.

MTS Systems Corp

Booth #331

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. Reliable, high-performance MTS solutions are deployed across a diversity of industries such as aerospace, power generation, civil engineering and automotive, accurately and efficiently meeting the most demanding materials testing requirements.

The MTS portfolio is engineered to address a full spectrum of materials testing requirements - from tension/compression to fracture mechanics to complex multi-axial fatigue studies at elevated temperatures. This portfolio features: high-performance servohydraulic, static-hydraulic and electromechanical testing systems; versatile, high-resolution controls; proven application software; precision accessories; robust environmental simulation systems; and unmatched service and support.

Explore the MTS booth and discover how innovative MTS test solutions and decades of industry expertise can optimize the effectiveness and efficiency of your materials research, development and production programs.

Nanovea

Booth #511

Nanovea designs and manufacture Profilometers, Mechanical Testers & Tribometers to combine the most advanced testing capabilities in the industry: Scratch Adhesion, Indentation Hardness, Wear Friction & 3D Non-Contact Metrology at Nano, Micro & Macro range. Unlike other manufacturers Nanovea also provides Laboratory Services, offering clients availability to the latest technology and optimal results through improvements in material testing standards.



Company Descriptions

National Filter Media Corporation Booth #519

At National Filter Media we take pride that we are one of the world's oldest and largest providers of air pollution control and liquid filtration products. NFM has achieved success by adhering to the same business principles practiced since the firm was founded in 1906. We believe in building partnerships with our customers and in earning their business every day. The technology has changed since 1906, but our commitment remains the same. We want to be long term partners with our customers.

Nederman Booth #339

Nederman has been in business since 1944 and is one of the world's leading companies supplying products and services to protect our environment. The new headquarters in Thomsville, NC and sales/manufacturing in Westland, MI and Reno, NV bring even greater capabilities to design, manufacture, install and service our products nationwide, providing you with complete turnkey solutions.

Our new product offering includes systems for the extraction and filtration of dust, gas, smoke, and automobile exhaust fumes, equipment for industrial cleaning, as well as at source extraction equipment and clamp-together ducting.

Netzsch Booth #327

Thermal analysis, calorimetry, thermal properties, & contract testing services; DSC, DTA, TGA, STA (Simultaneous DSC/DTA-TGA) from cryogenic to +2400C, evolved gas analysis by coupled FTIR, MS, and a new GC-MS system, adiabatic reaction calorimeters (ARC & APTAC) to measure thermal & pressure properties of exothermic chemical reactions, new MMC 274 tabletop reaction calorimeter, dilatometers, thermal conductivity, thermal diffusivity by laser flash & xenon flash to +2800C, DMA, TMA, and DEA - dielectric analysis for in-situ thermoset cure monitoring.

NFC - China Nonferrous Metal Industry Booth #425

China Nonferrous Metal Industry's Foreign Engineering & Construction Co., Ltd. (NFC) was founded in 1983. It is a state-controlled holding company listed on Shenzhen Stock Exchange in 1997. As a China leading enterprise engaged in general contracting of overseas nonferrous metal (particularly 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 and etc. It is also listed on ENR as one of the top 225 international contractors for consecutive years. With competitive edges in technology and rich experience in EPC contracting, NFC has consistently

been dedicated to global nonferrous metal industry. NFC is capable and willing to work with world partners by providing a portfolio of services including technologies, equipment supply and management.

NIST/Measurement Services Division Booth #222

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 #306

NNSC has built a strong technical force based on specialists who individually have up to 25 years experience in Primary Aluminium Industry for Potroom as well for Carbon Area, being 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.

Olympus Innov-X Booth #422

Olympus Innov-X provides portable handheld X-Ray Fluorescence (HHXRF) analyzers for simple, non-destructive sorting of challenging grade separations, alloy chemistry and grade ID in seconds. They provide highly specific material chemistry to rapidly and accurately 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

Company Descriptions

and large touch screen interface.

Opsis

Booth #419

Opsis is a worldwide supplier of gas monitoring systems for process control applications, industrial continuous emission monitoring and ambient air quality and fence-line monitoring.

Systems use open path UV-DOAS, FTIR and laser diode TDL technologies. Monitoring solutions are provided as integrated systems including gas measurements, additional sensors such as flow and temperature and software applications for reporting and networking.

Opsis systems have been implemented in applications in a wide range of industries globally, including aluminum smelters, power plants, incinerators, cement plants and sulfuric acid production plants.

The Opsis system does not need to extract any sample of the gas making it effective to measure reactive components such as ammonia, and strong acids. Same is applicable in case gas condition is either extremely corrosive or hot, or both.

Gaseous components that can be measured include, for example: SO₂, SO₃, NO_x, CO, CO₂, H₂O, NH₃, HCL, HF, CL₂, CLO₂, HCHO, BTX, O₃, Hg, HgTot. Measurements are certified under TUV, MCERTS and EPA.

A worldwide network of skilled distributor companies is available for sales and support. Opsis is a ISO 9001 and ISO 17025 certified company.

Outotec Ltd.

Booth #309

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. The company has over 50 years experience helping customers worldwide in both segments of the aluminum process to reach their goals. What sets Outotec apart from its competition?

They are there to help their customers from start to finish in terms of plant design, and they customize solutions to fit a client's specific needs. Outotec's processes and equipment have become industry standards and their references stretch back decades – a track record that has led to their current reputation as a leading innovative technology partner. The company also offers innovative solutions for the chemical industry, industrial water treatment and the utilization of alterna-

tive energy sources.

Parker Hannifin

Booth #206

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.

Photron Inc.

Booth #335

Photron offers a wide range of high-speed cameras; from HD resolution to 2,000 frames per second (fps), through dual miniature heads providing 2K fps for real time image processing, to the world's fastest mega pixel high speed camera providing reduced resolution to over one and a half million fps.

Precision Light and Air Ltd.

Booth #105

Precision Light and Air (PLA) is an Australian based industrial instrumentation manufacturer specializing in process analyzers for mining and metals industries. These analyzers are particularly suited for high temperature and high scale applications as in alumina and nickel refineries. Our flag ship Smartdiver is regarded as the industry standard for measuring mud level, clarity, interface and tank profiles in the most hostile operating environments. Other analyzers supplied globally by PLA include non-nuclear density gauges, slurry liquor phase density refractometers, inline ceramic conductivity meters and suspended solids meters. With a support team ranking second to none, PLA remains a premier solution provider in industry.



Company Descriptions

Proto Manufacturing

Booth #123

PROTO Manufacturing is a leading provider of portable and laboratory based x-ray diffraction systems and services including:

- X-ray diffraction residual stress measurement
- X-ray diffraction retained austenite and nitride analysis
- Laue single crystal orientation systems
- Custom powder diffraction systems
- Fine focus and micro focus x-ray tubes
- Electropolishers

PROTO Manufacturing also provides measurement services through its laboratories in the United States, Canada and Japan. Visit online at <http://www.protoxrd.com> or by e-mail at xrdlab@protoxrd.com.

RHI AG

Booth #516

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 #513

Since 1924 dedicated to the design and construction of furnace plants for carbon products (OPEN as well as CLOSED type), RIEDHAMMER is presently the only independent supplier worldwide being able to deliver complete solutions and technology for baking of anodes, cathodes, electrodes and special carbon products. More than 85 years of experience and know-how guarantee a high economic efficiency and reliability of the plants. In total RIEDHAMMER has executed more than 300 bake furnace projects in 25 countries. Our reference list includes major global players in the production of primary aluminum with pre-baked technology as well as top suppliers of cathodes and electrodes respectively for the aluminum and steel industry.

Rio Tinto Alcan

Booth #301

Global leader in the aluminium industry

Building on more than a century of experience and expertise, Rio Tinto Alcan is a global leader in the aluminium industry. We supply high quality bauxite, alumina and aluminium worldwide and our AP smelting technology is the industry benchmark. Our enviable hydroelectric power position delivers significant competitive advantages in today's carbon constrained world. Rio Tinto Alcan is the aluminium product group of Rio Tinto, a leading international business 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.

Sente Software Ltd.

Booth #338

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.

SLM Co., Ltd

Booth #240

We are an Aluminium Master Alloys Manufacturer located in Korea. Our company is specialized in Grain Refiners(AlTiB Alloys), Modifiers(AlSr Alloys) and Other Aluminium Alloys such as AlTi, AlB, AlV, AlMg, AlMn etc. We produce aluminium alloys in various forms such as Rod in coil, Cut Rod, Bar and Plate.

We have been producing high quality of Aluminium Master Alloys for 19 years and we export to over 20 countries. We supply high quality materials at competitive price.

We are looking for distributors now. Please visit our stand!

Company Descriptions

STAS

Booth #302

STAS is a Canadian based company specialized in the fabrication of process technologies for the aluminium industry.

The company has over 20 years experience, 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. STAS is a world leader in providing various equipment designed to improve productivity and the quality of molten aluminium.

Three main product lines are available:

1. Casthouse technologies, which include the Alcan Compact Degasser (ACD), the Rotary Flux Injector (RFI), the Inert Gas Dross Cooler (IGDC), the Deep Bed Filter (DBF) and the Treatment of Aluminium in Crucible (TAC).
2. Crucible cleaning shops, which include crucible cleaning systems, crucible preheating systems, and siphon tube cleaners and preheaters.
3. Pot room and rodding shop equipment, which include fume hoods to reduce HF emissions, anode positioning systems, anode stub inspection systems and anode butt inspection systems.

Sunstone

Booth #215

Sunstone Development Co., Ltd. ("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 in as many countries. Sunstone provides anodes to aluminium smelters in North America, Europe, Russia and the Middle East. The company holds ISO 9001, ISO 14001 and OHSAS 18001 certifications.

Other products and services supplied by Sunstone include calcined petroleum coke, cathode blocks, anode paste, cold ramming paste, anode slot sawing machinery, anode cleaning machinery, pot shells, anode yokes and other various equipment used by the aluminium industry.

Our company's mission is:

- To be the world's largest merchant anode manufacturer and supplier. To provide the highest quality integrated solutions and project management for the global electrolytic aluminium industry.
- To be recognized as the company with the "Best Practice" in the comprehensive utilization of resources in the prebaked anode industry.
- To be recognized as the company with the most environmentally friendly and energy efficient process that produces innovative and technologically superior anodes.

Techmo Car

Booth #413

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 Chargers and Crust Breakers. Beside its line of purposed designed vehicles, Techmo provides a number of stationary equipment such as Crucible Cleaning Machines, the Crucible Tilting stations and the Anode Butts Cleaning Stations.

Tenova Core

Booth #334

Tenova Core 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 also provides a wide range of heat treating, reheating and specialty furnaces as well as technical and spare parts services. Booth Personnel: Thomas Walsh, Bill Barraclough, Bert Mangold; visit Tenova Core online at www.tenovacore.com.

Thermo Scientific

Booth #423

Thermo Scientific product portfolio provides world-class solutions for analytical microscopists. See the QuasOr EBSD system and experience the seamless integration of EDS, WDS and EBSD in the NORAN System 7 X-ray microanalysis system. Also see our EDXRF, WDXRF/XRD and OES products for materials characterization in terms of qualitative and quantitative elemental/phase composition.

Thermo-Calc Software

Booth #223

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 expert evaluation of experimental data. Databases are available for Al, Mg, steels, Ni-superalloys, Ti, solders and other materials. Programming interfaces are available which enable Thermo-Calc to be called directly from in-house developed software or MatLab. DICTRA is used for accurate simulations of diffusion in multicomponent alloys. TC-PRISMA is a new software package for the simulation of precipitation kinetics in multicomponent alloys.



Company Descriptions

Tri-State Refractories Corp.

Booth #239

Tri-State Refractories is a full service contractor specializing in the Aluminum Industry. We offer turn key projects for Carbon Bake Furnaces, Aluminum Holding and Melters, De Laq Furnaces, Rotary Furnaces, Pot Lining, and most other requirements for plant operations. We also have maintenance contracts in place with Rio Tinto Alcan and Alcoa doing multi task type work throughout these facilities.

UES, Inc.

Booth #108

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.

RoboMet.3D™ is a fully automated, serial sectioning system that generates two-dimensional data for three-dimensional reconstruction. 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.

Additional areas of expertise for UES include materials science, metallurgy, ceramics, processing science, modeling and simulation, surface engineering, materials characterization, biotechnology, sensor development and nanomaterials.

University of Central Florida AMPAC Booth #119

The Advanced Materials Processing and Analysis Center (AMPAC) located at the University of Central Florida is an interdisciplinary research and education center for materials science and engineering. AMPAC excels in the development, processing and characterization of advanced materials, addressing a broad range of civilian and defense applications including energy, microelectronics, nanotechnology, sensors and actuators, biomaterials, lasers and propulsion. AMPAC administers the Materials Science and Engineering Graduate Program, a nationally ranked academic program. AMPAC is also home to the Materials Characterization Facility (MCF), a user facility with state-of-the-art electron microscopy, ion spectroscopy, x-ray analysis and much more. AMPAC also maintains the Advanced Microfabrication Facility, a class 1000 cleanroom facility for the fabrication and testing of semiconductor devices, thin films and more.

Westmoreland Advanced Materials, LLC

Booth #325

Westmoreland Advanced Materials manufactures a full line of premium refractory castables. In addition, the company provides innovative refractory technology for the aluminum industry. WAM® AL II is a truly unique, non-wetting corundum resistant refractory castable developed specifically for the aluminum industry. This family of products provides for all metal contact needs including a non-penetrable insulating product, a high strength/high density product, a gunning product and maintenance and repair products. Customers using this technology in aluminum metal processing applications have measured and documented energy savings up to 46%, maintenance savings of at least 50% and have reduced down times to 8% of typical.

If you process aluminum metal come visit us at booth #325 and learn how we can improve your processing efficiency and your cost to produce product.

York Linings Intl. Inc.

Booth #401

York Linings Inc. is a market leader in the design and installation of refractory linings in all major industries. We incorporate our own in-house experience and technology with that of the major refractory suppliers to provide our clients with an installed product that will provide the best lining performance in their specific industry.

YLI have been involved in many major Aluminum smelting plants in the United States and Overseas. Major projects include New Carbon Bake Furnaces, Reduction Cells, Cathode Sealing, Metal Holding Furnaces and Plant maintenance.

YLI are committed to deliver a quality Refractory project, meeting the high levels of design criteria, safety standards and schedule requirements for today's industrial climate, providing best results for the future of your facility.

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2012 Aluminum Plenary				
"Aluminum Industry Technology 2020, A Look Ahead"	Mon	AM	Southern III (D)	11
2012 Functional and Structural Nanomaterials: Fabrication, Properties, Applications and Implications				
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Nanomaterials for Information Technology	Mon	PM	Pelican 1 (S)	29
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1-Dimensional Nanomaterials and ZnO	Tues	PM	Pelican 1 (S)	81
Nanomaterials for Energy Technology	Wed	AM	Pelican 1 (S)	109
Structural Nanomaterials	Wed	PM	Pelican 1 (S)	136
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2012 Symposium on Surfaces and Heterostructures at Nano- or Micro-Scale and Their Characterization, Properties, and Applications				
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Carbon Nanomaterials and Heterostructures	Mon	PM	Pelican 2 (S)	29
Surfaces, Deposition, and Coatings	Tues	AM	Pelican 2 (S)	55
Energy and Catalysis	Tues	PM	Pelican 2 (S)	81
I-Energy II-Magnetic Materials III-Chemical Sensing and Surfaces	Wed	AM	Pelican 2 (S)	109
I-Chemical Sensing and Devices II-Biomaterials and Applications	Wed	PM	Pelican 2 (S)	137
3rd International Symposium on High Temperature Metallurgical Processing				
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Basic Research of Metallurgical Process	Tues	AM	Southern II (D)	56
Alloy and Materials Preparation	Tues	PM	Southern II (D)	82
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Treatment and Recycling of Solid Slag/Wastes	Thurs	AM	Southern II (D)	162
Pelletizing and Raw Materials Processing	Thurs	PM	Southern II (D)	182
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Session-II	Mon	PM	Macaw 1 (S)	30
Session-III	Tues	AM	Macaw 1 (S)	56
Session-IV	Tues	PM	Macaw 1 (S)	82
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Thermal Mechanical Processing	Tues	AM	Northern E1 (D)	58
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Stochastic Methods in Materials Research				
Session I.....	Tues	PM	Europe 7 (D)	104
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Symposium in Memory of Patrick Veysseyre: Understanding the Mechanisms Controlling Plastic Flow				
Dislocations Organization.....	Mon	AM	Europe 6 (D)	27
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Intermetallic Alloys.....	Tues	PM	Europe 6 (D)	105
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Deformation Mechanisms.....	Wed	PM	Europe 6 (D)	158
Titanium: Advances in Processing, Characterization and Properties				
Processing and Process Modeling I	Mon	AM	Oceanic 3 (D)	27
Processing and Process Modeling II	Mon	PM	Oceanic 3 (D)	52
Microstructure Evolution and Characterization I.....	Tues	AM	Oceanic 3 (D)	78
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Fatigue of Titanium Alloys.....	Wed	AM	Oceanic 3 (D)	133
Mechanical Properties.....	Wed	PM	Oceanic 3 (D)	159
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T.T. Chen Honorary Symposium on Hydrometallurgy, Electrometallurgy and Materials Characterization				
Plenary Session	Mon	AM	Northern A4 (D)	28
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Young Scientist	Wed	PM	Swan 5 (S)	160
Thermal Stability.....	Tues	AM	Swan 5 (S)	80
Applications and Transitions	Thurs	AM	Swan 5 (S)	181
Powder Processing.....	Wed	AM	Swan 5 (S)	135
Mechanical Response	Tues	AM	Swan 4 (S)	79
Advanced Analysis Methods	Wed	AM	Swan 4 (S)	134
Ultrasonic Fatigue of Advanced Materials and Systems				
Ultrasonic Fatigue of Metals and Alloys I.....	Wed	AM	Europe 1 (D)	136
Ultrasonic Fatigue of Metals and Alloys II; Very High Cycle Fatigue of Composites and MEMS.....	Wed	PM	Europe 1 (D)	161
Wettability and Interfacial Phenomena between Metals and Ceramic/Refractory Materials				
Session I.....	Wed	PM	Macaw 1 (S)	161



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			(D) Dolphin / (S) Swan	
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Aluminum Alloys: Fabrication, Characterization and Applications	Mon	PM	Atlantic Hall (D)	191
Biological Materials Science Symposium.....	Mon	PM	Atlantic Hall (D)	191
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Magnesium Technology 2012.....	Mon	PM	Atlantic Hall (D)	193
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Neutron and X-Ray Studies of Advanced Materials V	Mon	PM	Atlantic Hall (D)	198
Pb-Free Solders and Other Materials for Emerging Interconnect and Packaging Technologies	Mon	PM	Atlantic Hall (D)	198
Radiation Effects in Ceramic Oxide and Novel LWR Fuels	Mon	PM	Atlantic Hall (D)	198
Randall M. German Honorary Symposium on Sintering and Powder-Based Materials.....	Mon	PM	Atlantic Hall (D)	199
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About TMS Poster Sessions

The TMS 2012 Annual Meeting & Exhibition is pleased to provide a central area for all poster presentations at the conference. This area, located in the Atlantic Hall in the Dolphin Hotel near Registration, will include:

- Individual symposium poster sessions
- General poster session
- Student poster sessions (by division)

Presentation times:

Presenters should plan to be available to discuss their posters on **Monday, March 12, from 5:30 to 6 pm** in conjunction with the **President's Welcoming Reception in the exhibition hall.**

Poster installation and removal:

Presenters may install their posters on **Sunday, March 11, from 12 to 6 pm** and on **Monday, March 12, from 7 to 8 am.**

Presenters may remove their posters beginning at **noon on Wednesday, March 14.** All posters must be removed **before 5 pm on Wednesday.**

2012 Aluminum Plenary: "Aluminum Industry Technology 2020, A Look Ahead": Aluminum Industry Technology 2020, A Look Ahead

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Carlos Suarez, Alcoa Maaden JV

Monday AM Room: Southern III
 March 12, 2012 Location: Dolphin Resort

Session Chair: Carlos Suarez, Alcoa

8:30 AM Introductory Comments

8:35 AM

Acceleration of Cell Technology through Breaking Barriers: A Closer look at Innovation by High-Tech Sensor Technology and Energy Recovery Solutions: *Stephan Broek*¹; ¹Hatch Ltd

9:05 AM

Alumina Technology – Present and Future: *Ender Suvaci*¹; ¹Anadolu University

9:35 AM

A Sustainable Production of Primary Aluminum: *Claude Vanvoren*¹; ¹Rio Tinto Alcan

10:05 AM Break

10:15 AM

Driving Business Technology to Remain Competitive in the Aluminum Business: *Roberto De Andrade*¹; ¹Alcoa Inc

10:45 AM

Achieving Carbon Neutrality in the Global Aluminum Industry: *Subodh Das*¹; ¹Phinix LLC

11:15 AM

The Aluminum Story – The Positive Contribution of the Aluminium Industry and its Products to Sustainable Development: *Chris Bayliss*¹; ¹International Aluminium Institute

11:45 AM Panel Discussion

12:05 PM Concluding Comments

2012 Functional and Structural Nanomaterials: Fabrication, Properties, Applications and Implications: Carbon Nanomaterials

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Jiyoung Kim, University of Texas; David Stollberg, Georgia Tech Research Institute; Seong Jin Koh, University of Texas at Arlington; Nitin Chopra, The University of Alabama; Terry Xu, UNC Charlotte

Monday AM Room: Pelican 1
 March 12, 2012 Location: Swan Resort

Session Chairs: Jiyoung Kim, University of Texas at Dallas; Nae Eung Lee, SungKyunKwan University

8:30 AM Introductory Comments

8:45 AM Invited

Graphene -The Route Toward Applications: *Wonbong Choi*¹; ¹Florida International University

9:20 AM

Growth of Low Dimensional Carbon Nanomaterials: *John Boeckl*¹; Weijie Lu¹; William Mitchel¹; ¹Air Force Research Laboratory

9:40 AM

Piezoelectric Coated Carbon Nanotubes for Electronic Applications: David Stollberg¹; *Austin Mohney*²; ¹Georgia Tech Research Institute; ²Lock Haven University

10:00 AM Break

10:15 AM Invited

Engineering Improved Strain Capacity Carbon Nanotube Electrodes on Shape Memory Polymers for Cortical Brain Probes, Cochlear Implants, Flexible Antennas and Multi-Electrode Arrays: Dustin Simon¹; Taylor Ware¹; Yael Hanein²; Moshe David-Pur²; Edward Keefer³; *Walter Voit*¹; ¹UT Dallas; ²Tel-Aviv University; ³Plexon

10:50 AM

Photo-Ignition of Liquid Fuel Spray and Solid Fuel by Carbon Nanotubes: *Alireza Badakhshan*¹; Stephen Danczyk²; ¹Jacobs Technology Inc.; ²Air Force Res. Lab

11:10 AM

Boron Carbide Nanowires: Low Temperature Synthesis, Structural and Thermal Conductivity Characterization: *Zhe Guan*¹; Timothy Gutu¹; Juekuan Yang²; Yang Yang²; Deyu Li²; Terry Xu¹; ¹UNC Charlotte; ²Vanderbilt University

11:30 AM

Electrical and Mechanical Response of CNT Turfs under Normal Loads: *Anqi Qiu*¹; David Bahr¹; ¹Washington State University

2012 Symposium on Surfaces and Heterostructures at Nano- or Micro-Scale and Their Characterization, Properties, and Applications: Heterostructure Growth and Characterization

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Energy Conversion and Storage Committee, TMS: Nanomaterials Committee, TMS: Surface Engineering Committee, TMS: Young Leaders Committee, TMS: EMPMD Council

Program Organizers: Nitin Chopra, The University of Alabama; Ramana Reddy, The University of Alabama; Arvind Agarwal, Florida International University; Sandip Harimkar, Oklahoma State University; Jiyoung Kim, University of Texas at Dallas; Christopher Matranga, National Energy Technology Laboratory

Monday AM Room: Pelican 2
 March 12, 2012 Location: Swan Resort

Session Chairs: Nitin Chopra, The University of Alabama; Christopher Matranga, National Energy Technology Laboratory (NETL)

8:30 AM Introductory Comments

8:35 AM Invited

Defining Nanoscale Structure-Property Relationships in Nanowire Heterostructures: *Lincoln Lauhon*¹; ¹Northwestern University

9:10 AM Invited

Challenging the Trade-Offs in Synthesis and Application of Core/Shell Nanocrystal Fluorophores: *Andrew Greytak*¹; ¹University of South Carolina



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MONDAY AM

9:45 AM

Anisotropic Evaporation of GaN Nanowires Analyzed Using Atom Probe Tomography: *James Riley*¹; Rodrigo Bernal¹; Qiming Li²; Horacio Espinosa¹; George Wang²; Lincoln Lauhon¹; ¹Northwestern University; ²Sandia National Laboratories

10:05 AM

Fabrication of Silicon Nanowires by Metal Nanoparticles Assisted Anisotropic Etching and Their Electron Microscopic Studies: *Wenwu Shi*¹; Laura Phillips¹; Nitin Chopra¹; ¹The University of Alabama

10:20 AM Break

10:30 AM Invited

Hybrid Nanowires for Functional Applications: *Pelagia Gouma*¹; ¹SUNY Stony Brook

11:05 AM Invited

Tuning Color by Pore-Depth of Metal-Coated Nanostructured Porous Alumina: *Dongxian Zhang*¹; Xulongqi Wang¹; Haijun Zhang¹; Yi Ma¹; Jianzhong Jiang¹; ¹Zhejiang University

11:40 AM Invited

In-Situ TEM Controlled Growth of Silicide in Si Nanowires: *Yi-Chia Chou*¹; Mark Reuter²; King-Ning Tu³; Eric Stach⁴; Frances Ross²; ¹IBM/Purdue University; ²IBM T. J. Watson; ³University of California Los Angeles; ⁴Purdue University/BNL

12:15 PM

Development of ZnO/MgO/p⁺-Si Heterostructures for Pure UV Light Emitting Diode with Carrier Blocking Layer: *Byung Oh Jung*¹; Ju Ho Lee²; Hyung Koun Cho¹; Jeong Yong Lee²; Ho Seong Lee³; ¹Sungkyunkwan University; ²KAIST; ³Kyungpook National University

12:30 PM

The Temperature and Excitation Intensity Effects on the Photoluminescence Spectra of InAs /InP Quantum Dots: *Fatiha Besahraoui*¹; ¹Oran University

3rd International Symposium on High Temperature Metallurgical Processing: High Efficiency New Metallurgical Technology

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Energy Committee, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Patrick Masset, TU Freiberg; Onuralp Yucel, Istanbul Technical University; Rafael Padilla, University of Concepcion; Guifeng Zhou, Wuhan Iron and Steel

Monday AM

March 12, 2012

Room: Southern II

Location: Dolphin Resort

Session Chairs: Tao Jiang, Central South University; Merete Tangstad, Norwegian University of Science and Technology

8:30 AM Introductory Comments

8:40 AM

A Laboratory Investigation of the Reduction of the Siderite Iron Ore to Iron Nugget: *Nikolay Panishev*¹; Eugene Redin¹; Vladimir Pilshchikov²; ¹Magnitogorsk Iron & Steel Works; ²Hares Engineering GmbH

9:00 AM

Composite Agglomeration Process of Iron Ore Fines: *Tao Jiang*¹; Youming Hu¹; Guanghui Li¹; Yufeng Guo¹; Zhengwei Yu¹; Xiaohui Fan¹; Yuanbo Zhang¹; Yongbin Yang¹; ¹Central South University

9:20 AM

Investigation of Pyrometallurgical Nickel Pig Iron (NPI) Production Process from Lateritic Nickel Ores: Onuralp Yucel¹; *Ahmet Turan*¹; Halil Yildirim¹; ¹Istanbul Technical University

9:40 AM

Novel Process for Utilizing Low-Grade Manganese Oxide Ores by Sulfur-Based Reduction Roasting-Acid Leaching: Tao Jiang¹; Zhixiong You¹; *Yuanbo Zhang*¹; Daoxian Duan¹; Guanghui Li¹; ¹Central South University

10:00 AM Break

10:10 AM

Silicon Process Pilot Scale Experiment in a Semi Closed in a 440 kVA Furnace: *Ingeborg Solheim*¹; ¹SINTEF Materials and Chemistry

10:30 AM

Slide Gate Systems for Copper Tapping: Klaus Gamweger¹; *Andreas Schmid*¹; ¹RHI AG

10:50 AM

Recovery of Huangmei Limonite by Flash Magnetic Roasting Technique: *Wen Chen*¹; Xinghua Liu¹; Zeyou Peng¹; Qiulin Wang¹; ¹Changsha Research Institute Of Mining And Metallurgy

11:10 AM

Studies on Alternative Blast Furnace Burden Structure with High Proportion Sinter: Jianjun Fan¹; Guanzhou Qiu¹; Tao Jiang¹; Yufeng Guo¹; *Yongbin Yang*¹; Meixia Cai²; ¹Central South University; ²Taiyuan Iron and Steel (Group) Co. Ltd

11:30 AM

Hydrothermal Sulfidation of Carbonate-Hosted Zinc-Lead Ore with Elemental Sulfur: Cunxiong Li¹; *Chang WET*¹; ¹Kunming University of Science and Technology

Advances in Surface Engineering: Alloyed and Composite Coatings: Session I

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee

Program Organizers: Sandip Harimkar, Oklahoma State University; Srinivasa Bakshi, Indian Institute of Technology Madras; Arvind Agarwal, Florida International University

Monday AM

March 12, 2012

Room: Macaw 1

Location: Swan Resort

Session Chair: To Be Announced

8:30 AM Introductory Comments

8:35 AM Invited

An Overview of Dry Sliding Wear of Two-Phase FeNiMnAl Alloys: *I. Baker*¹; ¹Dartmouth College

9:00 AM Invited

CrN-Ag Nanocomposite Coatings: High-Temperature Lubrication through Nanopore Channels: *Daniel Gall*¹; Christopher Mulligan²; Paul Papi¹; Thierry Blanchet¹; ¹Rensselaer Polytechnic Institute; ²Benet Laboratories

9:25 AM Invited

Micromechanisms of Failure in Multilayered Hard Coatings of ZrN-Zr and TiAlN-TiN: *Vikram Jayaram*¹; Nisha Verma¹; ¹Indian Institute of Science

9:50 AM

Advances in Surface Engineering for Amorphous Coatings: *Sandip Harimkar*¹; ¹Oklahoma State University

10:10 AM Break

10:25 AM

Metal Matrix Composite Hardfacing by Additive Friction Stir: *Jeffrey Schultz*¹; ¹Schultz-Creehan Holdings, Inc

10:45 AM

Multiscale Mechanical and Tribological Behavior of Plasma Sprayed Carbon Nanotube Reinforced Aluminum Composites: *Srinivasa Bakshi*¹; Arvind Agarwal²; ¹Indian Institute of Technology Madras; ²Florida International University

11:05 AM

Microstructures and Wear Properties of (Ti_{1-x}Mo_x)N_y Hard Coatings: *Shoko Komiya*¹; Yuji Sutou¹; Junichi Koike¹; Mei Wang²; Takaomi Toihara²; ¹Tohoku University; ²OSG Corporation

11:25 AM

Wear Resistance of Spray Formed Stainless Steels: *Claudemiro Bolfarini*¹; Leamar Beraldo¹; Conrado Afonso¹; Claudio Kiminami¹; Walter Botta¹; ¹Universidade Federal de São Carlos

11:45 AM

Use of Thermo-Mechanical Simulator in Studying the Cyclic Oxidation of NiCrAlY Coatings: *Nidhi Rana*¹; R. Jayaganthan¹; Satya Prakash¹; ¹Indian Institute of Technology, Roorkee, India

Aluminum Alloys: Fabrication, Characterization and Applications: Development and Application

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Processing Committee
Program Organizers: Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum

Monday AM
March 12, 2012

Room: Northern E1
Location: Dolphin Resort

Session Chair: Steven Long, Kaiser Aluminum

8:30 AM

Aluminum Welded Blank Applications in the Automotive Industry: *Susan Hartfield-Wunsch*¹; Ravi Verma¹; Blair Carlson¹; ¹General Motors

8:50 AM

Influence of Stress on Sensitization in Al-Mg Alloys: *William Golumbfskie*¹; Jennifer Gaies¹; Mitra Taheri²; ¹Naval Surface Warfare Center, Carderock Division; ²Drexel University

9:10 AM

Material Performance of Naturally Sensitized Aluminum 5xxx Alloys: *Angela Whitfield*¹; Daniel Stiles¹; William Golumbfskie¹; ¹Naval Surface Warfare Center

9:30 AM

Precipitation of the θ^{\square} (Al₃Cu) Phase in Al-Cu-Ag Alloys: *Julian Rosalie*¹; Laure Bourgeois²; Barrington Muddle²; ¹National Institute for Materials Science; ²Monash University

9:50 AM

Using High-Resolution Topographic Imaging to Characterize the Hemming Performance of Automotive Aluminum Alloys: *Mark Stoudt*¹; Joseph Hubbard¹; John Carsley²; Susan Hartfield-Wunsch³; ¹National Institute of Standards and Technology; ²General Motors R&D Center; ³General Motors Technical Center

10:10 AM

Characterization of Electron Beam Deposited Aluminum Alloy 2139: *Milo Král*¹; Karl Buchanan¹; Craig Brice²; Marcia Domack²; Ravi Shenoy²; William Hofmeister³; ¹University of Canterbury; ²NASA Langley Research Center; ³UT Space Institute

10:30 AM Break

10:45 AM

Near Net Shaped Casting of 7050 Al Wrought Alloy by CDS Process: Microstructure and Mechanical Properties: *Seyed Giaasiaan*¹; Abbas Khalaf¹; Xiaochun Zeng¹; Sumanth Shankar¹; ¹McMaster University

11:05 AM

A Study of Stress Effects on η -Phase Precipitation in Al-Mg Alloys Using In-Situ TEM: *Daniel Scotto D'Antuono*¹; Jennifer Gaies²; William Golumbfskie²; Mitra Taheri¹; ¹Drexel University; ²Naval Surface Warfare Center

11:25 AM

Effect of Heat Treatment on Silicon in Hypereutectic Al-Si Alloy: *Ying Zhang*¹; ¹Zhengzhou Research Institute of CHALCO

Atomistic Effects in Migrating Interphase Interfaces - Recent Progress and Future Study: Interfacial Structure with Small Misfit

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee
Program Organizers: Tadashi Furuwara, Institute for Materials Research, Tohoku University; Sudarsanam Babu, Ohio State University; Hatem Zurob, McMaster University; Jian-Feng Nie, Monash University; Wen-Zheng Zhang, Tsinghua University; James Howe, University of Virginia

Monday AM
March 12, 2012

Room: Europe 3
Location: Dolphin Resort

Session Chairs: Tadashi Furuwara, Tohoku University; WenZheng Zhang, Tsinghua University

8:30 AM Introductory Comments Tadashi Furuwara

8:35 AM Invited

Topological Modelling of the Growth and Accommodation of Plate-Shaped Products Formed in Displacive Transformations: *Robert Pond*¹; John Hirth²; ¹University of Exeter; ²Private individual

9:05 AM Invited

Application of Edge-to-Edge Matching Model to Surface Transformation in a Titanium-Chromium Alloy: *Mingxing Zhang*¹; Dong Qiu¹; Patrick Kelly¹; ¹The University of Queensland

9:35 AM

Crystallographic Morphology Evolution in a FCC/BCC System via a Discrete Atom Method: *Dai Fu-Zhi*¹; Wen-Zheng Zhang¹; ¹THU

9:55 AM

Characterization of Alpha/Gamma Interfaces in a Bainitic Microstructure: *Sherri Hadian*¹; Gary Purdy¹; Gianluigi Botton¹; ¹McMaster Univrsity



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MONDAY AM

10:15 AM Break

10:30 AM Invited

Crystallography, Shape Change and Their Relationship in the Formation of Precipitate Plates/Laths: *Jian-Feng Nie*¹; ¹Monash University

11:00 AM

Modelling Morphologies of β' Precipitates in Mg-RE Alloys: *Hong Liu*¹; Yipeng Gao²; Zhe Liu¹; Yunzhi Wang²; Jian-Feng Nie¹; ¹Monash University; ²The Ohio State University

11:20 AM

HRTEM Investigations on Austenite/Ferrite Interfacial Structure in the 2205 Duplex Stainless Steel: *Hung-Wei Yen*¹; Jer-Ren Yang¹; ¹National Taiwan University

Biological Materials Science Symposium: Bio-Inspired Materials: Mechanics and Design

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Nima Rahbar, University of Massachusetts Dartmouth; Candan Tamerler, University of Washington; Po-Yu Chen, University of California, San Diego; Molly Gentleman, Texas A&M University

Monday AM

March 12, 2012

Room: Swan 7

Location: Swan Resort

Session Chairs: John Nychka, University of Alberta; Nima Rahbar, University of Massachusetts Dartmouth

8:30 AM Introductory Comments

8:35 AM

Bioinspired Ceramic Coatings: Durability and Potential for Self-Lubricity: *John Nychka*¹; Nathan Lun¹; ¹University of Alberta

8:55 AM

Structure-Property Relationships of the Natural Multi-Layered Material Systems: *Wayne Hodo*¹; Paul Allison¹; Mei Chandler¹; John Peters¹; Allan Kennedy¹; Rogie Rodriguez²; ¹ERDC; ²University of Puerto Rico - Mayaguez

9:10 AM

Quantum Effects in Interfacial Mechanics of Polymer-Ceramic Hybrid Biomaterials: *Devendra Dubey*¹; *Vikas Tomar*¹; ¹Purdue University

9:30 AM Break

9:40 AM Invited

Nonlinear Behavior of Silk Minimizes Damage and Begets Spider Web Robustness from the Molecules Up: *Markus Buehler*¹; Steven Cranford¹; Nicola Pugno¹; Anna Tarakanova¹; ¹Massachusetts Institute of Technology

10:10 AM Invited

Mechanics of Hierarchical Structures in Bone: *Shashindra Pradhan*¹; *Dinesh Katti*¹; *Kalpna Katti*¹; ¹North Dakota State University

10:40 AM

Phase Field Model of Fracture for Inhomogeneous Materials: *Mark Jhon*¹; Qian Xiao Li¹; ¹Institute of High Performance Computing

11:00 AM

A Study of Latrogenic Fracture Risk in Reduction of Pipkin Fracture-Dislocations of the Hip: *Michael Duffy*¹; *Samar Kalita*²; Gerald Bertetta²; Mark Munro¹; ¹Orlando Regional Medical Center; ²University of Central Florida

Bulk Metallic Glasses IX: Alloy Development and Application

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

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

Monday AM

March 12, 2012

Room: Swan 6

Location: Swan Resort

Session Chairs: Peter Liaw, The University of Tennessee; William Johnson, Keck Laboratory of Engineering

8:30 AM Keynote

Progress in Engineering Applications of Bulk Metallic Glasses: *William Johnson*¹; ¹University of Tennessee

9:00 AM

Glass Formation in a Laser-Glazed Zr-Cu-Ni-Al-Nb Alloy: *Brian Welk*¹; Hamish Fraser¹; Mark Gibson²; ¹The Ohio State University; ²CSIRO

9:10 AM Invited

Bulk Metallic Glasses: From Fundamentals to Applications: *Atakan Peker*¹; ¹Washington State University

9:30 AM

Fabrication of Microchannels for Micro-Fluidic Applications Using High Frequency Micromachining on an Amorphous Material: *Vivek Jain*¹; Apurbba Sharma¹; Pradeep Kumar¹; ¹Indian Institute of Technology Roorkee

9:40 AM Invited

Development of Porous Metallic Glass Compacts: *Ki Buem Kim*¹; ¹Sejong University

10:00 AM Break

10:15 AM Invited

Bulk Metallic Glasses Form Like Plastics: *Jan Schroers*¹; ¹Yale University

10:35 AM Invited

Mechanistic and Thermodynamic Origins of Toughness in Metallic Glasses: *Marios Demetriou*¹; William Johnson¹; Robert Ritchie²; ¹California Institute of Technology; ²University of California, Berkeley

10:55 AM Invited

Recent Research Efforts in Bulk Metallic Glass Matrix Composites at NASA JPL/Caltech: *Douglas Hofmann*¹; ¹NASA JPL/Caltech

11:15 AM

Glass Forming Ability of the Multi-component Bulk Metallic Glasses: *Anupriya Agrawal*¹; Logan Ward¹; Katharine Flores¹; Wolfgang Windl¹; ¹The Ohio State University

11:25 AM Invited

Effect of Casting Technique on Glass Formation of Bulk Metallic Glasses: *Tao Zhang*¹; ¹Beihang University

11:45 AM Invited

New Ti-Based Bulk Metallic Glasses for Biomedical Application: *Xidong Hui*¹; *Xialiang Zhou*¹; *Xiaohua Chen*¹; *Xiongjun Liu*¹; *Yuan Wu*¹; *Zhaoping Lu*¹; ¹University of Science and Technology Beijing

12:05 PM

Effect of Tungsten Reinforcement Particle Sizes on the Fabrication of Hf-Based Metallic Glass Matrix Composites: *Min Ha Lee*¹; *Daniel Sordelet*²; *Jürgen Eckert*³; ¹Korea Institute of Industrial Technology; ²Caterpillar Advanced Materials Technology Group; ³IFW Dresden

12:15 PM Invited

Ferromagnetic Fe-Based Bulk Metallic Glasses with Low Glass Transition Temperature and Large Supercooled Liquid Region: *Wei Zhang*¹; *Canfeng Fang*²; *Akihiro Makino*²; *Akihisa Inoue*³; ¹School of Materials Science and Engineering, Dalian University of Technology; ²Institute for Materials Research, Tohoku University; ³WPI, Advanced Institute for Materials Research, Tohoku University

12:35 PM

New Fe-C-Si-B-P-Cu Amorphous and Nanocrystalline Alloys Concurrently Possessing High Glass Forming Ability and Good Soft Magnetic Properties: *Jingen Gao*¹; *H.X. Li*¹; *Y. Wu*¹; *Z.P. Lu*¹; ¹University of Science and Technology Beijing

CFD Modeling and Simulation in Materials Processing I

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Laurentiu Nastac, The University of Alabama; Lifeng Zhang, Missouri University of Science and Technology; Brian Thomas, University of Illinois at Urbana-Champaign; Adrian Sabau, Oak Ridge National Lab; Nagy El-Kaddah, The University of Alabama; Adam Powell, Metal Oxygen Separation Technologies, Inc.; Hervé Combeau, Institut Jean Lamour

Monday AM
March 12, 2012

Room: Asia 4
Location: Dolphin Resort

Session Chairs: Lifeng Zhang, Missouri University of Science and Technology; Raj Venturumilli, Ansys, Inc.

8:30 AM Keynote

Fluid Flow, Solidification and Inclusion Entrapment during Steel Centrifugal Casting Process: *Lifeng Zhang*¹; *Edith Martinez*¹; *Kent Peaslee*¹; ¹Missouri University of Science and Technology

9:00 AM Invited

A Coupled CFD-Thermodynamic-Kinetic Model to Simulate a Gas Stirred Ladle Refining Process: *Raj Venuturumilli*¹; *Pavan Shivaram*²; ¹ANSYS, Inc.; ²U.S. Steel Corporation

9:25 AM Invited

A Micro-Macro Model of a PEM Fuel Cell System: *Thiyagarajan Paramadhyalan*¹; *Hrushikesh Pimpalgaonkar*¹; *Suresh Sundarraj*¹; ¹General Motors

9:50 AM

Mathematical Modelling of Welding Process of Al/Al₂O₃ Nanocomposites Produced by Solidification Route: *Payodhar Padhi*¹; *France Behera*¹; ¹Konark Institute of Science & Technology

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

Modeling the Effects of Tool Geometries on the Temperature Distributions and Material Flow of Friction Stir Aluminum Welds: *Hrusikesh Mohanty*¹; *Manas Mahapatra*¹; *Pradeep Kumar*¹; *P K Jha*¹; ¹Indian Institute of Technology Roorkee

10:50 AM

Determination of Heat Transfer Coefficient Distribution at Part Surface during Press Quenching Process Using CFD: *Morgan Guardino*¹; *Soraya Benitez*²; *Liang He*¹; *Richard D. Sisson*¹; ¹Wocester Polytechnic Institute; ²Sikorsky Aircraft

11:10 AM

Fuzzy Extraction Separation Optimized Process of Tm, Yb and Lu Enriched Oxides by Computer Simulation: *Fengli Yang*¹; *Sh Yang*¹; *Mingzhou Li*¹; *Changren Tong*¹; ¹Jiangxi University of Science and Technology

11:30 AM

Understanding Fuming during Metal Refining by CFD: *Jan Erik Olsen*¹; *Mari Naess*²; *Gabriella Tranel*²; ¹SINTEF Materials & Chemistry; ²NTNU

11:50 AM

CFD-Based Modelling on Interfacial Heat Transfer for Water Quenching: *Gang Wang*¹; *Yiming Rong*¹; ¹Tsinghua University

12:10 PM

Mathematical Model of Purges Process at a Heat Treatment Furnace: *Irma Hernández*¹; *Jacobo Vargas*²; ¹Universidad Autónoma del Estado de México; ²UAEMex

Characterization of Minerals, Metals, and Materials: Characterization of Ferrous Metals I

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jiann-Yang Hwang, Michigan Technological University; Sergio Montero, State University of North Rio De Janeiro; Chenguang Bai, Chongqing University; John Carpenter, US Department of Energy; Donato Firrao, Politecnico di Torino; Byoung-Gon Kim, Korea Institute of Geoscience & Mineral Resources; Mingdong Cai, Schlumberger

Monday AM
March 12, 2012

Room: Asia 2
Location: Dolphin Resort

Session Chairs: Jian Li, CANMET-MTL; Donato Firrao, Politecnico di Torino

8:30 AM

Characterization of the Microstructure of Compacted Graphite Cast Iron: *Vahid Rastegar*¹; ¹Dalarna University

8:50 AM

EBSD Analysis of Complex Microstructures of CSP® Processed Low Carbon Micro-Alloyed Steels: *Carl-Peter Reip*¹; *Reinhard Flender*²; *Matthias Frommert*²; ¹SMS Siemag AG; ²Salzgitter Mannesmann Forschung GmbH

9:10 AM

Empirical Models of Cold Working Effect in Steel Tube Production: *Robert Batson*¹; *Jing Zhang*¹; ¹University of Alabama



TMS 2012

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MONDAY AM

9:30 AM

Correlation of Cu Precipitation with Austenite Decomposition in a Continuously Cooled Multicomponent Steel: An Atom Probe Tomography Study: *Qingdong Liu*¹; Wenqing Liu¹; Shijin Zhao¹; Qifeng Zeng²; ¹Shanghai University; ²Shanghai Nuclear Engineering Research & Design Institute

9:50 AM

Effect of Epsilon Martensite on Low Temperature Tensile Properties of Fe-12Mn and Fe-14Mn Steels: *Jung-Su Kim*¹; Jong Bae Jeon¹; Joong Eun Jung¹; Young Won Chang¹; ¹POSTECH

10:10 AM Break

10:20 AM

Microstructural Investigation of Carbon Steel after Hot Rolling to Optimize Complex Hot Forming of Thick Plates: *Gerhard Tober*¹; Okechukwu Anopuo²; Petra Maier¹; ¹University of Applied Sciences Stralsund; ²CORTRONIK GmbH

10:40 AM

Microstructural Characterization of Fe-Mn-C Ternary Alloy under Near-Rapid Solidification: *Wenbin Xia*¹; Rong Yang¹; Changjiang Song¹; Qijie Zhai¹; ¹Shanghai University

11:00 AM

Effects of Surface Modifications on SCW Corrosion Resistance: *Jian Li*¹; Penttila Sami²; Wenyue Zheng¹; ¹CANMET-MTL; ²VTT

11:20 AM

Interface Mass Transfer during the Tribofinishing Process: *Isaia Hilerio*¹; Dulce Medina²; Victor Cortes²; Juan Muñoz²; ¹UAM AZCAPOTZALCO; ²UAM Azcapotzalco

11:40 AM

Martensitic Meso- and Nanostructures in High-Carbon Low-Alloyed Steels: *Albin Stormvinter*¹; Peter Hedström¹; Annika Borgenstam¹; ¹KTH Royal Inst. of Technology

Computational Thermodynamics and Kinetics: In Honor of Dr. Long-Qing Chen, EMPMD Outstanding Scientist: Session I

Sponsored by: The Minerals, Metals and Materials Society, 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, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Phase Transformations Committee, TMS: Process Technology and Modeling Committee
Program Organizers: Zi-Kui Liu, The Pennsylvania State University; Mark Asta, University of California, Berkeley; James Warren, The National Institute of Standards and Technology; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yu Wang, Michigan Tech

Monday AM

March 12, 2012

Room: Australia 3

Location: Dolphin Resort

Session Chairs: Mark Asta, UC Berkeley; Yunzhi Wang, Ohio State

8:30 AM Introductory Comments

8:35 AM Keynote

Phase-Field Modeling of Microstructure Evolution in Elastically Inhomogeneous Systems: *Long Qing Chen*¹; Saswata Bhattacharyya¹; Taewoo Heo¹; Jianjun Wang¹; Qun Li¹; ¹Pennsylvania State University

9:05 AM Invited

Phase Field of Prototyping Structural Transformations and Properties in Systems with Long-Range Interaction: *Armen Khachaturyan*¹; ¹Rutgers University

9:30 AM Invited

Diffusive Molecular Dynamics Simulation of Displacive-Diffusional Coupling in Solid State Processes: Sanket Sarkar¹; William Cox¹; Ju Li²; Yunzhi Wang¹; ¹Ohio State University; ²MIT

9:55 AM Break

10:20 AM Invited

Origin of Negative Thermal Expansion Phenomenon in Solids: *Zi-Kui Liu*¹; Yi Wang¹; Shun Li Wang¹; ¹The Pennsylvania State University

10:45 AM Invited

Coherent Precipitation in Ternary Al Alloys: Colin Ophus¹; Maarten de Jong²; *Mark Asta*²; Marcel Sluiter³; Ulrich Dahmen¹; Velimir Radmilovic⁴; ¹Lawrence Berkeley National Laboratory; ²University of California, Berkeley; ³Delft University of Technology; ⁴University of Belgrade

11:10 AM Invited

Interplay between Surface Segregation, Ordering, and Adsorption Behavior of Pt-Alloy Surfaces: Wei Chen¹; *Chris Wolverton*¹; David Schmidt²; William Schneider²; ¹Northwestern University; ²Univ. of Notre Dame

11:35 AM Invited

Twin Boundary Behaviors of Magnetic Shape Memory Alloys: *Yongmei Jin*¹; ¹Michigan Technological University

Defects and Properties of Cast Metals: Metal Cleanliness

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Mark Jolly, University of Birmingham; Brian Thomas, University of Illinois at Urbana-Champaign; Carl Reilly, University of British Columbia

Monday AM

March 12, 2012

Room: Oceanic 4

Location: Dolphin Resort

Session Chairs: John Grandfield, Grandfield Technology Pty Ltd; Daan Maijer, University of British Columbia

8:30 AM Introductory Comments

8:40 AM

Films and Bifilms – An Update: *John Campbell*¹; ¹University of Birmingham

9:00 AM

Fluid Flow and Inclusion Entrapment in the Runner Steel During Ingot Casting: *Lifeng Zhang*¹; Yongfeng Chen¹; Shufeng Yang¹; ¹Missouri University of Science and Technology

9:20 AM

Modeling of Mould Filling of Low-Pressure Die-Cast Aluminum Alloy Wheels: *Jianglan Duan*¹; Daan Maijer¹; Steve Cockcroft¹; Carl Reilly¹; Ken Nguyen¹; Dominic Au¹; ¹University of British Columbia

9:40 AM Break

10:00 AM

Quench Sensitivity of 2024, 6063 and 7075: *Engin Tan*¹; Ali Tarakcilar¹; Derya Dispinar²; ¹Pamukkale University; ²University of Istanbul

10:20 AM

Effect of Different Casting Parameters on the Cleanliness of High Manganese Steel Ingots Compared to High Carbon Steel: *Petrico von Schweinichen*¹; Zhiye Chen¹; Dieter Senk¹; Alexander Lob¹; ¹RWTH Aachen University, Department of Ferrous Metallurgy, Intzestrasse 1, 52072 Aachen, Germany

10:40 AM

Tensile Properties, Porosity and Melt Quality Relation of A356: *Derya Dispinar*¹; Shahid Akhtar²; Arne Nordmark¹; Freddy Syvertsen¹; Marisa Di Sabatino²; Lars Arnberg²; ¹SINTEF Materials and Chemistry; ²NTNU

11:00 AM

Investigation on Non-metallic Inclusions of Q420 Ingots Cast by Bottom Teeming: *Yanzhao Luo*¹; Jiongming Zhang²; Chao Xiao²; Jin Yang²; ¹University of Science & Technology Beijing ; ²University of Science & Technology Beijing

11:20 AM

Tracking the Formation and End Location of Oxides in Orthopaedic Investment Casting Running Systems: *Mark Jolly*¹; Alan Kavanagh²; ¹University of Birmingham; ²Depuy Johnson & Johnson

Emeritus Professor George D.W. Smith Honorary Symposium: Atom Probe Tomography

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Michael Miller, Oak Ridge National Laboratory; Gregory Olson, Northwestern University and QuesTek Innovations LLC; George Krauss, Colorado School of Mines

Monday AM
March 12, 2012

Room: Mockingbird 2
Location: Swan Resort

Funding support provided by: Oak Ridge National Laboratory; QuesTek Innovations LLC; AMETEK, Inc

Session Chairs: Michael Miller, Oak Ridge National Laboratory; Thomas Kelly, Cameca Instruments, Inc.

8:30 AM Introductory Comments**8:45 AM Keynote**

Look Back in Wonder: A Partial View of a Lifetime's Developments in Atom Probe Technology: *Alfred Cerezo*¹; ¹University of Oxford

9:15 AM Keynote

Prospects for Atomic-Scale Tomography: *Thomas Kelly*¹; Michael Miller²; Krishna Rajan³; Simon Ringer⁴; Albina Boresevich²; ¹Cameca Instruments, Inc.; ²Oak Ridge National Laboratory; ³Iowa State University; ⁴University of Sydney

9:45 AM Invited

Recent Developments in Atom Probe Microscopy: From Data to Information and through to Knowledge: *Simon Ringer*¹; ¹The University of Sydney

10:15 AM Break**10:45 AM Invited**

APT Applied to MgO-Based Magnetic Tunnel Junctions: *Amanda Petford-Long*¹; Daniel Schreiber²; David Seidman²; ¹Argonne National Laboratory; ²Northwestern University

11:10 AM Invited

Atom Probe Tomography of Thin Films and Interfaces: *David Larson*¹; ¹Cameca Instruments, Inc.

11:35 AM

Atom Probe Studies of Nitride Multilayer Hard Coatings: *Darius Tytko*¹; ¹Max-Planck Institut für Eisenforschung

11:50 AM Invited

Modelling Image Formation in Atom Probe Tomography: *François Vurpillot*¹; ¹GPM UMR 6634

12:15 PM

Coupled Modeling and Observation of Morphological Change in APT of Multicomponent Materials: *Daniel Haley*¹; George Smith¹; ¹University of Oxford

Energy Nanomaterials: Li-ion Batteries

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Reza Shahbazian-Yassar, Michigan Technological University; Ming Au, Savannah River National Laboratory; Meyya Meyyappan, NASA Ames Research Center

Monday AM

March 12, 2012

Room: Swan 3

Location: Swan Resort

Session Chairs: Reza Shahbazian Yassar, Michigan Technological University; Ming Au, Savannah River National Laboratory

8:30 AM Invited

Advanced Materials for Energy Storage Application: *Ilias Belharouk*¹; ¹Argonne National Laboratory

8:55 AM

Nanoscale Testing of Low Dimensional Materials for Energy Harvesting and Storage: *Reza Shahbazian-Yassar*¹; Hessam Ghassemi¹; Anjana Asthana¹; Yoke Yap¹; ¹Michigan Technological University

9:10 AM

Nanostructured 3.9 V Triplate Cathode Materials for Li-Ion Batteries: *Prabeer Barpanda*¹; Jean Marie Tarascon²; ¹The University of Tokyo; ²Universite de Picardie Jules Verne

9:25 AM Invited

A Nanofiber Approach to Advanced Lithium-Ion Battery Materials: *Xiangwu Zhang*¹; ¹North Carolina State University

9:50 AM Break**10:10 AM Invited**

Carbon-Containing Nanocomposite Materials for Energy Storage: *Gleb Yushin*¹; ¹Georgia Institute of Technology

10:35 AM

Nanostructured Metals and Metal Oxides for High Capacity Anodes of Li-Ion Rechargeable Batteries: *Ming Au*¹; Thad Adams¹; ¹Savannah River National Laboratory

10:50 AM

Nano-Crystalline Sn/Co-C Alloys Prepared as a High Stable Anode for Lithium Ion Batteries: *Youlan Zou*¹; Xiangyang Zhou¹; Juan Yang¹; Jie Li¹; Jingjing Tang¹; ¹Central South University

11:05 AM

Transmission Electron Microscopy Studies on Lithium Battery Materials III: Effect of Aluminum Substitution in Layered Oxides: *Alpesh Shukla*¹; Thomas Conry¹; Marca Doeff¹; Thomas Richardson¹; ¹Lawrence Berkeley National Laboratory



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MONDAY AM

11:20 AM

The Effects of Annealing on the Charge-Discharge Characteristics of Eutectic Al-Si Thin Film with Pre-Deposited Al Layer: *Chao-Han Wu*¹; Fei-Yi Hung¹; Truan-Sheng Lui¹; Li-Hui Chen¹; ¹Department of Materials Science and Engineering, National Cheng Kung University

Fatigue and Corrosion Damage in Metallic Materials: Fundamentals, Modeling and Prevention: Fundamentals of Fatigue Damage and Modeling

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum; Peter Liaw, University of Tennessee

Monday AM

Room: Oceanic 6

March 12, 2012

Location: Dolphin Resort

Session Chairs: Tongguang Zhai, University of Kentucky; Michael Sangid, Purdue University

8:30 AM Introductory Comments

8:35 AM Invited

Fatigue Modeling - Linking Microstructure to Predictions of Fatigue Crack Initiation: *Michael Sangid*¹; Huseyin Sehitoglu²; ¹Purdue University; ²University of Illinois, Urbana-Champaign

9:00 AM Invited

A FIB Study of the Resistance of Grain Boundaries to Short Fatigue Crack Propagation in Three-Dimensions in High Strength Al Alloys: *Wei Wen*¹; A. H. W. Ngan²; Tongguang Zhai¹; ¹University of Kentucky; ²University of Hong Kong

9:25 AM Invited

On Crack Initiation and Early Growth of Very-High-Cycle Fatigue for High Strength Steels: *Youshi Hong*¹; Aiguo Zhao¹; Chengqi Sun¹; ¹Institute of Mechanics, Chinese Academy of Sciences

9:50 AM

Quantification of Fatigue Weak-Links in 713 Cast Al Alloys: *Zhiqiang Xu*¹; Xinliang Zang¹; Yanguang Liu¹; Yuanbin Zhang²; Bin Xu²; Tongguang Zhai³; ¹College of Mechanical Engineering, Yanshan University; ²Materials Science and Engineering Department, Shandong Jianzhu University; ³Chemical and Materials Engineering Department, University of Kentucky

10:15 AM Break

10:25 AM Invited

Fundamental Principle of Cyclic Deformation and Dislocation Evolution in fcc Single Crystals: *Peng Li*¹; Shouxin Li¹; Zhongguang Wang¹; Zhefeng Zhang¹; ¹Institute of Metal Research

10:50 AM

Fatigue Interrogating 3D Synthetic Microstructures of Ni-Based Alloys: *Joseph Tucker*¹; Clayton Stein¹; Lisa Chan²; Albert Cerrone³; Anthony Rollett¹; Anthony Ingraffea³; ¹Carnegie Mellon University; ²EDAX; ³Cornell University

11:10 AM

Modeling Intergranular Crack Growth in a Nickel Based Superalloy: *Kimberly Maciejewski*¹; Hamouda Ghonem¹; ¹University of Rhode Island

11:30 AM

Investigating Deformation Mechanisms Under Dwell-Fatigue in a Ni-base Superalloy: *G. B. Viswanathan*¹; Dan Huber²; Sushant Jha¹; Sara Knox³; Ken Bain⁴; Hamish Fraser²; C Woodward¹; ¹Air Force Research Laboratory; ²The Ohio State University; ³Southwestern Ohio Council for Higher Education; ⁴GE Aviation

From Macro to Nano, Understanding Mechanical Behavior across Length Scales: A Structural Materials Division Symposium in Honor of Robert Ritchie: Biological and Bioinspired Materials Science

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Biomaterials Committee

Program Organizers: Jamie Kruzic, Oregon State University; Brad Boyce, Sandia National Labs; Reinhold Dauskardt, Stanford University

Monday AM

Room: Mockingbird 1

March 12, 2012

Location: Swan Resort

Session Chairs: Marc Meyers, University of California, San Diego; Markus Buehler, MIT

8:30 AM Introductory Comments

8:35 AM Keynote

Studies of Mechanical Properties of Materials across Length Scales: *Subra Suresh*¹; ¹Department of Materials Science and Engineering, Massachusetts Institute of Technology

9:15 AM

Structural Hierarchies Define Toughness and Defect-Tolerance Despite Simple and Mechanically Inferior Brittle Building Blocks: *Markus Buehler*¹; ¹Massachusetts Institute of Technology

9:30 AM

Enhanced Energy Dissipation through Size-Dependent Nanoscale Heterogeneity in Bone: *Ming Dao*¹; ¹MIT

9:45 AM

Multiscale Modeling of R-Curve Behaviors in Bone Tissue: *Kwai Chan*¹; Daniel Nicoletta¹; ¹Southwest Research Institute

10:00 AM Break

10:15 AM Keynote

Scale Effects and Hierarchy in Biological Materials: *Marc Meyers*¹; Po-Yu Chen²; ¹UCSD; ²National Tsing Hua U.

10:55 AM

On the Exceptional Fracture Toughness of Elk Antler Bone: *Po-Yu Chen*¹; Maximilien Launey²; Joanna McKittrick³; Robert Ritchie⁴; ¹National Tsing Hua University; ²Lawrence Berkeley National Laboratory; ³University of California, San Diego; ⁴University of California, Berkeley

11:10 AM

Aging-Related Changes in the Plasticity and Toughness of Human Cortical Bone at Multiple Length-Scales: *Elizabeth Zimmermann*¹; Eric Schaible¹; Hrishikesh Bale¹; Holly Barth¹; Simon Tang²; Peter Reichert¹; Bjorn Busse¹; Tamara Alliston²; Joel W Ager III¹; Robert O. Ritchie¹; ¹Lawrence Berkeley National Lab; ²University of California San Francisco

11:25 AM

Mechanical Behavior in Human Cortical Bone Across Multiple Length Scales: Investigations of Elastic Anisotropy and Damage Accumulation: *Ryan Roeder*¹; Andrew Baumann¹; Travis Turnbull¹; Joshua Gargac¹; David Rudy¹; Justin Deuerling¹; Glen Niebur¹; ¹University of Notre Dame

Integrative Materials Design: Performance and Sustainability: Processing and Properties of Traditional and Novel Materials at Ambient and High Temperatures I

Sponsored by: The Minerals, Metals and Materials Society, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizer: Diana A. Lados, Worcester Polytechnic Institute

Monday AM Room: Europe 2
March 12, 2012 Location: Dolphin Resort

Session Chair: Diana Lados, Worcester Polytechnic Institute

8:30 AM Introductory Comments

8:35 AM Invited

Nanostructured Metals: Synergy between Multiple Scales: *Enrique J. Lavernia*¹; ¹University of California, Davis

9:00 AM Invited

Optimization of Mechanical Properties in Ultrafine Grained Lightweight Alloys: *Rajiv Mishra*¹; ¹Missouri University of Science and Technology

9:25 AM Invited

Friction Stir Welding in Aluminum and Magnesium Alloys: Effects of Processing Parameters on Microstructure and Mechanical Properties: *Andrew Biro*¹; Diana Lados¹; ¹WPI

9:50 AM

Sequential Approximate Optimization Based Robust Design of SiC-Si₃N₄ Nanocomposite Microstructures: Gilberto Mejia-Rodriguez¹; Vikas Tomar²; John Renaud³; ¹San Luis Potosi; ²Purdue University; ³University of Notre Dame

10:10 AM Break

10:35 AM Invited

Bulk Metallic Glasses: Highly Processable, High Performance Materials: *Jamie Kruzic*¹; ¹Oregon State University

11:00 AM

Characterization of Nickel Rich NiTiHf Shape Memory Alloys for Use as High Temperature Actuators: *Daniel Coughlin*¹; Glen Bigelow²; Anita Garg²; Ronald Noebe²; Michael Mills¹; ¹Ohio State University; ²NASA Glenn Research Center

11:20 AM Invited

Design of Smart Metal-Matrix Composites for Sustainability and Advanced Performance: *Charles Fisher*¹; Michele Manuel¹; ¹University of Florida

11:40 AM

Multi-Scale Design of Open-Cell Aluminum Alloy Foam: *Daeyong Kim*¹; Ji Hoon Kim¹; Myoung-Gyu Lee²; Jong Kook Lee³; ¹Korea Institute of Materials Science; ²Pohang University of Science and Technology; ³Hyundai Motor Company

International Smelting Technology Symposium (Incorporating the 6th Advances in Sulfide Smelting Symposium): Plenary Session

Sponsored by: The Minerals, Metals and Materials Society, The Metallurgy and Materials Society of CIM, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
Program Organizers: Jerome Downey, Montana Tech of the Univ of Montana; Thomas Battle, Midrex Technologies, Inc.; Jesse White, Elkem Solar Research

Monday AM Room: Northern A3
March 12, 2012 Location: Dolphin Resort

Session Chair: To Be Announced

8:30 AM Introductory Comments

8:40 AM Keynote

2012 EPD DISTINGUISHED LECTURER: Conservation & Development: Industrial Learning in Non-Ferrous Smelting: *Theo Lehner*¹; ¹Boliden Mineral AB

9:25 AM

Modernization and New Copper Smelter Project Developments on the Central African Copperbelt: *Timothy Smith*¹; ¹SNC Lavalin

9:55 AM Break

10:10 AM

Developments in DC Arc Smelting Technology in Southern Africa: *Rodney Jones*¹; Isabel Geldenhuys¹; Glen Denton¹; ¹Mintek

10:40 AM

Aluminothermic Smelting: A Versatile Process Serving Demanding Markets: *James Robison*¹; ¹Reading Alloys, Inc., an Ametek Company

11:10 AM

The Blast Furnace: What Was, What Is, and What Will Be: *Mark Schlesinger*¹; David Robertson¹; ¹Missouri University of Science and Technology

Magnesium Technology 2012: Plenary Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht; Neale Neelameggham, U.S. Magnesium

Monday AM Room: Southern IV
March 12, 2012 Location: Dolphin Resort

Session Chairs: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht

8:30 AM Introductory Comments

8:45 AM Keynote

Magnesium Alloy Development Using Phase Equilibria Computation and Microstructure Validation: *Alan Luo*¹; Raja Mishra¹; Bob Powell¹; Anil Sachdev¹; ¹General Motors Corporation

9:15 AM Keynote

Research and Application of Mg Alloys for Aerospace: *Donald Shih*¹; ¹The Boeing Company

MONDAY AM



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MONDAY AM

9:45 AM Keynote

Atoms-to-Grains Corrosion Modeling for Predictive Design of Mg-Alloys: *Santanu Chaudhuri*¹; Jie Xiao¹; Hyunwook Kwak¹; ¹Washington State University

10:15 AM Break

10:30 AM Keynote

Solid State Joining of Magnesium to Steel: *Yuri Hovanski*¹; Michael Santella²; Saumyadeep Jana¹; Hao Yu³; David Field³; Tsung-Yu Pan²; Siva Pilli¹; ¹Pacific Northwest National Laboratory; ²Oak Ridge National Laboratory; ³Washington State University

11:00 AM Keynote

Grain Evolution During High Temperature Necking of Magnesium Alloys: *Paul Krajewski*¹; ¹General Motors

11:30 AM Keynote

Production of Wide Shear-Rolled Magnesium Sheet for Part Forming: *David Randman*¹; Bruce Davis¹; Martyn Alderman¹; Govindarajan Muralidharan²; Thomas Muth²; Thomas Watkins²; William Peter²; ¹Magnesium Elektron North America; ²Oak Ridge National Laboratory

Materials and Fuels for the Current and Advanced Nuclear Reactors: Nuclear Fuels - Modeling

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS/ASM: Nuclear Materials Committee

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Monday AM Room: Swan 2
March 12, 2012 Location: Swan Resort

Session Chair: Ramprashad Prabhakaran, Idaho National Laboratory

8:30 AM Invited

3-Dimensional, High-Resolution Modeling of Nuclear Fuel Performance: Pellet Clad Interaction: *Brian Wirth*¹; Derek Gaston²; Jason Hales²; Richard Martineau²; Robert Montgomery³; Y.R. Rashid⁴; Chris Stanek⁵; ¹University of Tennessee; ²Idaho National Laboratory; ³Pacific Northwest National Laboratory; ⁴Anatech Corp.; ⁵Los Alamos National Laboratory

9:00 AM

Multiscale Modeling of Reactor Fuel Restructuring: *Michael Tonks*¹; Paul Millett¹; Bulent Biner¹; Liangzhe Zhang¹; Xianming Bai¹; ¹Idaho National Laboratory

9:20 AM

Phase-Field Modeling of Pore Migration in Nuclear Fuels Due to a Temperature Gradient: *Liangzhe Zhang*¹; Michael Tonks¹; Paul Millett¹; Bulent Biner¹; Yongfeng Zhang¹; Karthikeyan Chockalingam¹; ¹Idaho National Laboratory

9:40 AM

Computational Crystal Plasticity with the Jacobian-Free Newton Krylov Method: *Karthik Chockalingam*¹; Micheal Tonks¹; Paul Millett¹; Bulent Biner¹; ¹Idaho National Laboratory

10:00 AM

Thermomechanical Properties Prediction of Complex Heterogeneous Irradiated Nuclear Fuel: *Dongsheng Li*¹; Yulan Li¹; Fei Gao; Ram Devanathan; Xin Sun¹; Mohammed Kahleel¹; ¹Pacific Northwest National Laboratory

10:20 AM Break

10:30 AM

Effect of Di- and Quad-Interstitials on the Diffusivity of Oxygen in UO_{2+x}: *Rakesh Behera*¹; Taku Watanabe¹; David Andersson²; Blas Uberuaga²; Chaitanya Deo¹; ¹Georgia Institute of Technology; ²Los Alamos National Laboratory

10:50 AM

First-Principles Theory of Magnetism, Crystal Field and Phonon Spectrum of UO₂: *Fei Zhou*¹; Vidvuds Ozolins¹; ¹UCLA

11:10 AM

Investigation of the Stability and Energies of Defect and Defect Clusters In bcc-U Using Atomic Level Simulations: *Priyank Shukla*¹; Benjamin Beeler¹; Erin Haywar¹; Chaitanya Deo¹; Michael Baskes²; Maria Okuniewski³; ¹Georgia Institute of Technology; ²University of California, San Diego; ³Idaho National Laboratory

11:30 AM

A Semi-Empirical Interatomic Potential for bcc U: *Benjamin Beeler*¹; Chaitanya Deo¹; Michael Baskes²; Sergey Rashkeev³; Maria Okuniewski³; ¹Georgia Institute of Technology; ²University of California-San Diego; ³Idaho National Laboratory

11:50 AM

Influence of Zn on the Thermodynamic Stability in the FeO-Fe₂O₃-NiO System: *Dongwon Shin*¹; Theodore Besmann¹; David Andersson²; ¹Oak Ridge National Laboratory; ²Los Alamos National Laboratory

Materials Processing Fundamentals: Process Metallurgy of Metals

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Process Technology and Modeling Committee

Program Organizers: Lifeng Zhang, Missouri University of Science and Technology; Antoine Allanore, MIT; Cong Wang, Saint-Gobain High Performance Materials

Monday AM Room: Oceanic 8
March 12, 2012 Location: Dolphin Resort

Session Chairs: Lifeng Zhang, Missouri S&T; Antoine Allanore, MIT

8:30 AM Introductory Comments

8:35 AM

A Critical Review of the Modified Froude Number in Ladle Metallurgy: *Krishnakumar Krishnapisharody*¹; Gordon Irons¹; ¹McMaster University

9:00 AM

Inclusion Characteristics in Stainless Steel Ingots: *Shufeng Yang*¹; *Lifeng Zhang*¹; Yongfeng Chen¹; ¹Missouri University of Science and Technology

9:25 AM

FEM Study of Centerline Defect Closure In Large Open-Die Forgings: *Jie Zhou*¹; Joshua Blackketter¹; Philip Nash¹; ¹Illinois Institute of Technology

9:50 AM

Effect of Mould Taper and Wall Thickness on Steel Ingots Soundness by 3-D Solidification Simulation: *Peng Lan*¹; Yang Li¹; Jiaquan Zhang¹; Ruitian Zhang²; Jingyuan Wang²; Hengyi Zhang²; ¹Department of Metallurgical Engineering and State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing; ²Angang Subsidiary Enterprise Company

10:15 AM Break

10:25 AM

Hydrometallurgical Study of Purifying MG Silicon Feedstock for Solar Cells Production: *Yongqiang Liu*¹; Jilai Xue¹; Jun Zhu¹; ¹University of Science and Technology Beijing

10:50 AM

The Effect of Fe Addition on the Activity of Si in Liquid Cu-Si Alloys: *Yuichi Kato*¹; Takeshi Yoshikawa¹; Kazuki Morita¹; ¹University of Tokyo

11:15 AM

Thermodynamic Properties of the Silicon Binary Melts: *Jafar Safarian*¹; Leiv Kolbeinsen¹; Merete Tangstad¹; ¹Norwegian University of Science and Technology

11:40 AM

Minor Element Distributions in Mount Isa Copper Smelter: *Pengfu Tan*¹; ¹Xstrata Copper

Materials Research in Microgravity: Session I

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Robert Hyers, University of Massachusetts; Hani Henein, University of Alberta; Valdis Bojarevics, University of Greenwich; James Downey, NASA; Douglas Matson, Tufts University; Achim Seidel, Astrium; Daniela Voss, ESA

Monday AM

Room: Asia 3

March 12, 2012

Location: Dolphin Resort

Session Chair: To Be Announced

8:30 AM Introductory Comments

8:35 AM Invited

Materials Science Experiments under Microgravity - A Review of History, Facilities, and Future Opportunities: *Christian Stenzel*¹; ¹Astrium

9:10 AM

The Materials Science Laboratory

An Opportunity for Materials Processing on Board the ISS: *Petra Neuhaus*¹; *Harald Lenski*²; ¹Astrium; ²Astrium

9:35 AM Invited

Novel Second Generation Inserts for the MSL Aboard ISS: *Florian Kargl*¹; *Christian Stenzel*²; *Andreas Meyer*¹; ¹German Aerospace Center (DLR); ²Astrium

10:10 AM Break

10:30 AM Invited

Results of the MICAST Experiments in MSL Onboard the ISS: *Sonja Steinbach*¹; *Lorenz Ratke*¹; *Sadik Dost*²; *Robert Erdmann*³; *Yves Fautrelle*⁴; *Jacques Lacaze*⁵; *Andras Roos*⁶; *Gerhard Zimmermann*⁷; ¹DLR; ²University of Victoria; ³University of Arizona; ⁴ENSHMG; ⁵CIRIMAT; ⁶SGMU; ⁷ACCESS

11:05 AM Invited Microgravity Melting Experiments: Revealing the Mechanism of Dendritic Growth: *Martin Glicksman*¹; ¹University of Florida

11:40 AM

Phase-Field Simulation of Dendrite Fragmentation: *Maziar Aghvami*¹; *Christoph Beckermann*¹; ¹University of Iowa

Mechanical Behavior at Nanoscale I: In-situ Technique on Deformation Process

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Scott Mao, University of Pittsburgh; Julia R Greer, California Institute of Technology; Jianyu Huang, Center for Integrated Nanotechnologies; Marc Legros, CEMES-CNRS; Ting Zhu, Georgia Institute of Technology

Monday AM

Room: Asia 1

March 12, 2012

Location: Dolphin Resort

Session Chairs: Scott X Mao, University of Pittsburgh; Julia Greer, California Institute of Technology

8:30 AM Introductory Comments

8:35 AM Invited

Micro-Compression Testing of Cu: About Single Crystals, Grain Boundaries and Polycrystals: *Gerhard Dehm*¹; *Peter Imrich*²; *Christoph Kirchlechner*³; *Bo Yang*⁴; *Christian Motz*²; ¹Erich Schmid Institute of Materials Science, Austrian Academy of Sciences and Materials Physics, University of Leoben; ²Erich Schmid Institute of Materials Science, Austrian Academy of Sciences; ³University of Leoben, Materials Physics; ⁴Materials Center Leoben GmbH

9:05 AM Invited

On Atomic Resolution In-Situ Electron Microscopy Study of Abnormal Mechanical Properties of Nanowires and Ultra-Thin Layers: *Ze Zhang*¹; *X.D. Han*²; ¹Department of Materials Science and Engineering, Centre of Electron Microscopy; ²Institute of Microstructure and Properties of Advanced Materials

9:35 AM

Deformation of Gold Nanowires: Elongation Mechanisms and Quantum Conductance: *Lyle Levine*¹; *Francesca Tavazza*¹; *Douglas Smith*¹; *Anne Chaka*¹; *Jon Pratt*¹; ¹National Institute of Standards and Technology

9:55 AM Break

10:05 AM Invited

Size Matters for Deformation Twinning in Single Crystal Metals: *Evan Ma*¹; ¹Johns Hopkins University

10:35 AM

In Situ TEM Observations of Reverse Dislocation Motion upon Unloading of Ultrafine-Grained (UFG) Aluminium Strained in the Microyield Region: *Daniel Caillard*¹; *Frederic Mompou*¹; *Marc Legros*¹; *Hael Mughrabi*²; ¹CNRS; ²University of Erlangen

10:55 AM

Direct Observation of Deformation Behaviors in Nanostructured Ceramic Materials by In Situ Nanoindentation in TEM: *Haiyan Wang*¹; *Joon Hwan Lee*¹; *Amiya Mukherjee*²; *Xinghang Zhang*¹; ¹Texas A&M University; ²UC Davis

11:15 AM

Localized Crystal Rotation in Gum Metal at Ideal Strength: *Shigeru Kuramoto*¹; *Tadahiko Furuta*¹; *Daigo Satoyama*¹; *Elizabeth Withey*²; *J.W. Morris, Jr.*³; ¹Toyota Central R&D Labs., Inc.; ²Lawrence Livermore National Laboratories; ³University of California, Berkeley

11:35 AM

Stress-Driven Grain Boundary Migration in Ultrafine-Grained Mg Film: *Yong Zhang*¹; *John Sharon*¹; *Kevin Hemker*¹; ¹Johns Hopkins University



TMS 2012

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MONDAY AM

11:55 AM

TEM Studies on Microstructure and Mechanical Properties of Nanotwinned Metals: *Ying Zhang*¹; James Anderegg¹; Ryan Ott¹; Mikhail Mendeleev¹; Matthew Kramer¹; ¹Ames Lab

12:15 PM

Interface Dominated Small Scale Plasticity in a Ni-Based Superalloy: *Robert Maass*¹; Bin Gan²; Sammy Tin²; Lucas Meza¹; Julia Greer¹; ¹California Institute of Technology; ²Illinois Institute of Technology

Mechanical Behavior Related to Interface Physics: Grain Boundaries: Experiment and Modeling

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Izabela Szlufarska, University of Wisconsin-Madison; Zhiwei Shan, Xi'an Jiaotong University

Monday AM

March 12, 2012

Room: Oceanic 1

Location: Dolphin Resort

Session Chairs: Zhaohui Jin, Shanghai Jiao Tong University; Douglas Irving, North Carolina State University

8:30 AM Keynote

Observations of Stress-Coupled Grain Boundary Migration: John Sharon¹; Frederic Mompou²; Marc Legros²; *Kevin Hemker*¹; ¹Johns Hopkins University; ²CEMES-CNRS

9:00 AM Keynote

Atomistic Modeling of Grain Boundary Sliding/Migration and Related Mechanical Behavior in FCC Metals: X.M. Su¹; *Z.H. Jin*¹; P. Gumbsch²; K. Lu³; ¹Shanghai Jiao Tong University; ²Karlsruher Institut für Technologie (KIT); ³Institute of Metal Research (IMR)

9:30 AM

Dislocation Pileups in fcc Aluminum Bicrystals: *Steven Valone*¹; Jian Wang¹; Richard Hoagland¹; Timothy Germann¹; ¹Los Alamos National Laboratory

9:45 AM

Molecular Dynamics Simulation of Energy Dissipation at the Liquid/Solid Interface with Slip Boundary Condition: *Kai Huang*¹; Izabela Szlufarska¹; ¹UW-Madison

10:00 AM

Nucleation and Early Growth of Mechanical Deformation Twins in Hexagonal Close-Packed Metals Deformed at Extreme Conditions: *George Kaschner*¹; Stephen Niezgod¹; Rodney McCabe¹; Carlos Tome¹; ¹Los Alamos National Laboratory

10:15 AM Break

10:25 AM Keynote

Coupled Grain Boundary Motion in a Nanocrystalline Grain Boundary Network: Mario Velasco¹; *Helena Van Swygenhoven*¹; Christian Brandl²; Enrique Martinez-Saez²; Alfredo Caro²; ¹Paul Scherrer Institute; ²Los Alamos National Laboratory

10:55 AM Keynote

Multi-Scale Simulation of the Mechanical Response of Metal/Metal Interfaces in Non-Equilibrium Environments: *Douglas Irving*¹; ¹North Carolina State University

11:25 AM

Atomistic Modeling of Structure and Twinning from the {112}KS Cu-Nb Interface: *Keonwook Kang*¹; Jian Wang¹; Irene Beyerlein¹; ¹LANL

11:40 AM

Phase Separation of Binary Alloy: Effects of Semi-Coherent Interface: *Siu Sin Quek*¹; Rajeev Ahluwalia¹; David Srolovitz¹; ¹Institute of High Performance Computing Singapore

11:55 AM

Interface Bond Strength of HIP-Clad Depleted Uranium and 6061-Aluminum: *Manuel Lovato*¹; Cheng Liu¹; William Blumenthal¹; ¹Los Alamos National Laboratory

Mechanical Performance of Materials for Current and Advanced Nuclear Reactors: Mechanical Behavior of Reactor Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Nicholas Barbosa, National Institute of Standards & Tech; Greg Oberson, United States Nuclear Regulatory Commission; Matthew Kerr, United States Nuclear Regulatory Commission; Elaine West, Knolls Atomic Power Laboratory; Stuart Maloy, Los Alamos National Laboratory; Osman Anderoglu, LANL

Monday AM

March 12, 2012

Room: Swan 1

Location: Swan Resort

Session Chairs: Nick Barbosa, NIST; Whitney Poling, Colorado School of Mines

8:30 AM

Crack Tip Deformation Mechanisms in hcp Zr with and without Dilute H Impurities: *Margarita Ruda*¹; Graciela Bertolino²; Diana Farkas³; A. Baruj²; ¹CNEA and Univ. N. del Comahue; ²CONICET; ³Virginia Tech

8:50 AM

Fracture Toughness of 9Cr-1MoV and Thermally Aged Alloy 617 for Advanced Reactor Applications: *Randy Nanstad*¹; Mikhail Sokolov¹; Xiang (Frank) Chen²; ¹Oak Ridge National Laboratory; ²University of Illinois

9:10 AM

Influence of Cold Work and Sensitization on Stress Corrosion Cracking of Stainless Steel: *Elaine West*¹; Nathan Lewis¹; David Morton¹; Bryan Miller²; ¹Knolls Atomic Power Laboratory; ²Bettis Atomic Power Laboratory

9:30 AM

Time-Dependent Fatigue Crack Propagation in Ni-Based Solid-Solution-Strengthened Superalloys INCONEL 617 and HAYNES 230: *Longzhou Ma*¹; Shawoon Roy¹; ¹University of Nevada Las Vegas

9:50 AM

Strain Localization During Creep-Fatigue Deformation of Alloy 617: Mark Carroll¹; *Laura Carroll*¹; Richard Wright¹; ¹Idaho National Laboratory

10:10 AM Break

10:30 AM

Creep Behaviors of a Nanocluster-Strengthened Ferritic Steel: *M Brandes*¹; G Daehn¹; M Miller²; M Mills¹; ¹The Ohio State University; ²Oak Ridge National Laboratory

10:50 AM

Creep Deformation Mechanisms in Grade 91 Steel: *Triratna Shrestha*¹; Mehdi Basirat¹; Indrajit Charit¹; Gabriel Potirniche¹; Karl Rink¹; Uttara Sahaym²; ¹University of Idaho; ²Washington State University

11:10 AM

High Temperature Aging Study on Long-Term Aged Alloy 617 and Alloy 230: *Yang Zhao*¹; Kun Mo¹; James Stubbins¹; ¹University of Illinois at Urbana Champaign

11:30 AM

High Temperature Creep Studies on Nano Structured Ferritic Alloys: *E. Stergar*¹; M. Salston¹; K. Fields¹; Y. Wu¹; G. R. Odette¹; ¹University of California-Santa Barbara

11:50 AM

Creep Behavior of High Temperature Alloys for Intermediate Heat Exchanger in Next Generation Nuclear Plant: *Xingshuo Wen*¹; Laura Carroll²; Richard Wright²; T. L. (Sam) Sham³; Vijay Vasudevan¹; ¹University of Cincinnati; ²Idaho National Laboratory; ³Oak Ridge National Laboratory

Nanocomposites: Mechanical Behavior and Modelling of Nanocomposites

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Composite Materials Committee

Program Organizers: Garth Wilks, Air Force Research Laboratory; Jonathan Spowart, Air Force Research Laboratory; Meisha Shofner, Georgia Institute of Technology; John Zhanhu Guo, Lamar University

Monday AM

Room: Swan 8

March 12, 2012

Location: Swan Resort

Session Chairs: Jonathan Spowart, Air Force Research Laboratory; Nikhil Gupta, Polytechnic Institute of New York University

8:30 AM

Mechanomodifiable Nanomaterials: Multiscale Computational and Experimental Studies: *Markus Buehler*¹; Steven Cranford¹; Christine Ortiz¹; ¹Massachusetts Institute of Technology

8:50 AM

Compressive Strength of Epoxy- Graphite Nanoplatelets Composites: *H. A. Colorado*¹; A. Wong¹; J M Yang¹; ¹University of California, Los Angeles

9:10 AM Invited

Graphene Based Composite Materials: *Nikhil Koratkar*¹; ¹Rensselaer Polytechnic Institute

9:50 AM

Compressive Properties of Polymeric Syntactic Foams at Various Quasi-Static and High Strain Rates: Vasanth Chakravarthy Shunmugasamy¹; Dinesh Pinisetty¹; *Nikhil Gupta*¹; ¹Polytechnic Institute of New York University

10:10 AM

Thermal Expansion of Carbon Nanofiber Reinforced Syntactic Foams: Ronald Poveda¹; Sriniket Achar¹; *Nikhil Gupta*¹; ¹Polytechnic Institute of New York University

10:30 AM Break

10:50 AM

Atomistic and Continuum Understanding of the Particle Clustering and Particle Size Effect on the Room and High Temperature Strength of SiCN Nanocomposites: *Vikas Tomar*¹; ¹Purdue University

11:10 AM

Mechanical Response of the PMMA-CNT Nanocomposite via Molecular Dynamics: *Yae Ji Kim*¹; Eugenio Jaramillo²; Benjamin Haley¹; Alejandro Strachan¹; ¹Purdue University; ²Texas A&M International University

11:30 AM

Micromechanical Analysis of Influences of Agglomerated Nanotube Interphase on Effective Material Properties of a Three Phase Piezoelectric Nanocomposit: *Tian Tang*¹; Paul Wang¹; ¹Mississippi State University

11:50 AM

Effect of Nano-Paper Coating on Flexural Properties of a Fire-Treated Glass Fiber-Reinforced Polyester Composite: *Jamie Skovron*¹; Jinfeng Zhuge¹; Ali Gordon¹; Jan Gou¹; ¹University of Central Florida

12:10 PM

Finite Element Modeling of the Nanoscratching of Polymer Surfaces: *William Chirdon*¹; Joshua Rozas¹; ¹University of Louisiana at Lafayette

Neutron and X-Ray Studies of Advanced Materials V: Centennial: Von Laue, Bragg and Diffraction Centennial

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Xun-Li Wang, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Lyle Levine, National Institute of Standards and Technology; Peter Liaw, Univ of Tennessee; Yandong Wang, Beijing Institute of Technology; Brent Fultz, California Institute of Technology

Monday AM

Room: Southern I

March 12, 2012

Location: Dolphin Resort

Funding support provided by: Office of Basic Energy Sciences, U.S. Dept. of Energy, Dr. P. Thiyagarajan

Session Chairs: Wolfgang Pantleon, Risoe National Laboratory; Xun-Li Wang, SNS

8:30 AM Keynote

Materials Research with X-Rays: *Gernot Kostorz*¹; ¹ETH Zurich

8:55 AM Invited

Diffuse Scattering Resulting from Macromolecular Frustration: *Richard Welberry*¹; ¹Research School of Chemistry

9:15 AM Invited

Residual Strain Measurement by X-Ray and Neutron Diffraction: The First 100 Years: *Philip Withers*¹; ¹University of Manchester

9:35 AM Invited

Inelastic Neutron Scattering Measurements and Calculations of Anharmonic Phonons in fcc Metals: *Brent Fultz*¹; Xiaoli Tang¹; Chen Li¹; ¹California Institute of Technology

9:55 AM Invited

Monitoring Strain Path Changes by High Resolution Reciprocal Space Mapping: Christian Wejdemann¹; Ulrich Lienert²; Henning Poulsen¹; *Wolfgang Pantleon*¹; ¹Risoe DTU; ²Argonne National Laboratory



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MONDAY AM

10:15 AM Break

10:20 AM Invited

Diffraction from Vibrating Crystals: From Ultrasound to Phonons: *Klaus-Dieter Liss*¹; *Andreas Mager*²; ¹ANSTO; ²University of Erlangen-Nürnberg

10:40 AM Keynote

Real Space Atomic Correlation and Elastic/Inelastic Scattering from Disordered Systems: *Takeshi Egami*¹; ¹University of Tennessee

11:05 AM Invited

From Closed Packed Metal Structures to Monoclinic SMA and Multiphase Complex Materials: 20 Years of Rietveld Stress-Texture Analyses: *Luca Lutterotti*¹; ¹University of Trento

11:25 AM Invited

Internal Strain Evolution during Thermomechanical Cycling of NiTi Shape Memory Alloys Investigated Using Neutron Diffraction: *Raj Vaidyanathan*¹; *Othmane Benafan*¹; *Doug Nicholson*¹; *Ron Noebe*²; *Santo Padula*²; *Bjorn Clausen*³; *Don Brown*³; *Sven Vogel*³; ¹UCF; ²NASA Glenn Research Center; ³Los Alamos National Laboratory

11:45 AM Invited

Small-Angle Scattering with Synchrotron Radiation and Neutrons - Precise Experimental Techniques for Quantitative and Structural Analysis in Chemistry and Physics: *Guenter Goerigk*¹; ¹Helmholtz-Zentrum Berlin

12:05 PM Keynote

Hard X-ray Microscopy and its Application to Energy Science - Current Studies and Next-Generation Capabilities: *Jörg Maser*¹; *Barry Lai*¹; ¹Argonne National Laboratory

Pb-Free Solders and Other Materials for Emerging Interconnect and Packaging Technologies: Studies of Mechanical Properties and Effects of Current I

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Iver Anderson, Ames Laboratory; Sung Kang, IBM; Albert Wu, National Central Univ; Laura Turbini, Research in Motion; Tae-Kyu Lee, Cisco Systems; Govindarajan Muralidharan, Oak Ridge National Lab; John Elmer, Lawrence Livermore National Lab; Yan Li, Intel

Monday AM

March 12, 2012

Room: Swan 9

Location: Swan Resort

Session Chair: To Be Announced

8:30 AM Invited

Impact of Sn Grain Orientation and Isothermal Aging on Pd Added Sn-Ag-Cu Solder Interconnect Board Level Mechanical Shock Performance: *Tae-Kyu Lee*¹; *Bite Zhou*²; *Thomas R. Bieler*²; *Kuo-Chuan Liu*¹; ¹Cisco Systems; ²Michigan State University

8:55 AM Invited

Effect of Temperature Dependant Deformation Characteristics on Thermomechanical Fatigue Reliability of Eutectic Sn-Ag Solder Joints: *Deep Choudhuri*¹; *Andre Lee*¹; *K.N. Subramanian*¹; ¹Michigan State University

9:20 AM

Stress-Strain Behavior of Lead Free Solder Joints Determined by Digital Image Correlation Techniques: *Golta Khatibi*¹; *Martin Lederer*¹; *Brigitte Weiss*¹; *Herbert Ipser*¹; ¹University of Vienna

9:40 AM

Effect of Continuous Recrystallization on Pb-Free Solder Joints in Thermo-mechanical Fatigue(TMf): *Liang Yin*¹; *Babak Arfaei*²; *Peter Borgesen*²; ¹Universal Instruments Corp; ²Binghamton Univeristy

10:00 AM

Influence of Aging on Fatigue Behavior of SnAgCu Solders: *Jonathon Tucker*¹; *Dennis Chan*¹; *Ganesh Subbarayan*¹; *Carol Handwerker*¹; ¹Purdue University

10:20 AM Break

10:30 AM

Influence of Solder Microstructure and Intermetallic Layer Thickness on Mechanical Shock Resistance of Pb-free Solder Joints: *K. Yazzie*¹; *H. Fei*²; *H. Jiang*²; *N. Chawla*¹; ¹Materials Science and Engineering, School for Engineering of Matter, Transport, and Energy, Fulton Schools of Engineering, Arizona State University; ²Mechanical and Aerospace Engineering, School for Engineering of Matter, Transport, and Energy, Fulton Schools of Engineering, Arizona State University

10:50 AM

Effects of Crystal Orientation on Recrystallization and Damage in Lead-Free Solders during Thermal Cycling in Low and High Stress Package Designs: *Bite Zhou*¹; *Thomas Bieler*¹; *Tae-Kyu Lee*²; *Kuo-Chuan Liu*²; ¹Michigan State University; ²Cisco Systems, Inc

11:10 AM

Study on Fatigue Mechanism in Pb-Free Solder Joint using Isothermal Shear Fatigue: *Huili Xu*¹; *Choong-Un Kim*¹; *Tae-Kyu Lee*²; *Hong-Tao Ma*²; *Kuo-Chuan Liu*²; ¹The University of Texas at Arlington; ²Cisco System Incorporation

11:30 AM

Retarding Electromigration on Lead-Free Solder Joints by Micro-Sized Metal Particle Reinforcements: *Limin Ma*¹; *Yong Zuo*¹; *Guangchen Xu*¹; *Fu Guo*¹; ¹Beijing University of Technology

11:50 AM

Effect of Thermomigration on Redistribution and Growth of Intermetallic Compounds in the Sn_{0.7}Cu Solder Bump under Current Stressing: *Wei-Yu Chen*¹; *Kwang-Lung Lin*¹; ¹National Cheng Kung University

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XI: Solder-related Reliability Issues

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikuo Ohnuma, Tohoku University; Clemens Schmetterer, TU Bergakademie Freiberg; Yee-Wen Yen, National Taiwan University of Science and Technology; Shih-Kang Lin, University of Wisconsin – Madison

Monday AM
March 12, 2012

Room: Swan 10
Location: Swan Resort

Session Chairs: Chih-Ming Chen, National Chung Hsing University; Katsuaki Suganuma, Osaka University

8:30 AM Invited

Effect of Crystal Orientation on Mechanically Induced Sn Whiskers of Sn-Cu Platings: *Yukiko Mizuguchi*¹; Yosuke Murakami²; Shigetaka Tomiya²; Tadashi Asai³; Tomoya Kiga³; Katsuaki Suganuma⁴; ¹Sony Corporation, Osaka University; ²Sony Corporation; ³Sony EMCS Corporation; ⁴Osaka University

8:50 AM

Effects of Cu-Bearing Flux on Joint Reliability and Microstructure of Sn-3.5Ag/ENIG Joint: *Hitoshi Sakurai*¹; Youichi Kukimoto²; Chang-Jae Kim¹; Katsuaki Suganuma¹; ¹Osaka University; ²Harima Chemicals, Inc

9:05 AM

Gold and Palladium Induced Embrittlement Phenomenon in Microbumps Using Au/Pd(P)/Ni(P) Metallization Pads: *Wei-Hsiang Wu*¹; Chia-Ming Li¹; Yen-Chen Lin¹; Cheng-En Ho¹; ¹Yuan Ze University

9:20 AM

Inhibiting Cu-Sn Intermetallics by a Pre-Heat Treatment: *Chih-Chia Hu*¹; Hsiang-Yao Hsiao¹; Chih Chen¹; ¹National Chiao Tung University

9:35 AM

Rare-Earth Containing Lead-Free Solders with Enhanced Ductility: *Huxiao Xie*¹; Nikhlesh Chawla¹; ¹Arizona State University

9:50 AM

Study of Orientation of Solder Grains in Microbumps for 3D IC Packaging: *Han-wen Lin*¹; Chih Chen¹; ¹National Chiao Tung University

10:05 AM Break

10:15 AM Invited

Effect of External Strain on Growth of Interfacial Intermetallic Compounds between Sn on Cu Substrate: Yu-Ting Wang¹; Shin-Nan Li¹; *Ming-Tzer Lin*¹; ¹National Chung Hsing University

10:35 AM

Development and Evaluation of Direct Deposition of Au/Pd(P) Bilayer on the Cu Metallization in Soldering Applications: *Cheng-En Ho*¹; T. T. Kuo¹; H. G. Wang¹; C. W. Fan¹; ¹Yuan Ze University

10:50 AM

Effective Suppression of Electromigration-Induced Cu Dissolution by Using a Ag Barrier Layer in Lead-Free Solder Joints: *Chao-hong Wang*¹; Han-ting Shen¹; Wei-han Lai¹; ¹National Chung Cheng University

11:05 AM

Driving Force of EM-Induced Cu Dissolution in Cu-Sn Compound: *Cheng Tse Lu*¹; Cheng-Yi Liu¹; ¹National Central University

11:20 AM

Reactive Wetting of Heterogeneous Substrates by Sn-based Solders: Q. Lai¹; L. Zhang¹; *J. Shang*²; ¹Institute of Metal Research; ²University of Illinois

11:35 AM

The Cross-Interaction in the Ni/Sn/Cu Sandwich-Type Solder Joint with Electroless Pd Surface Finish: *Chi-Pu Lin*¹; Chih-Ming Chen¹; ¹National Chung-Hsing University

11:50 AM

Grain Boundary Penetration of Various Types of Ni Layers by Molten Pb: *Chia Yuan Chang*¹; C. Robert Kao¹; ¹National Taiwan University

Randall M. German Honorary Symposium on Sintering and Powder-Based Materials: Sintering Theory and Practice

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: K. Morsi, San Diego State University; Fernand Marquis, Naval Postgraduate School; John Meyer, Iowa State University; Ahmed El-Desouky, San Diego State University; Eugene Olevsky, San Diego State University

Monday AM

March 12, 2012

Room: Oceanic 2

Location: Dolphin Resort

Session Chair: Eugene Olevsky, San Diego State University

8:30 AM Introductory Comments

8:40 AM Keynote

History of Sintering: *Randall German*¹; ¹San Diego State University

9:10 AM Invited

Grain Growth during Sintering of Nanosized Particles: *Zhigang Fang*¹; Hongtao Wang¹; Vineet Kumar²; ¹University of Utah; ²Kennametal Inc.

9:35 AM Invited

Distortion in a 7xxx Aluminium Alloy Sintered in Nitrogen under Different Flow Patterns: Xini Yuan¹; *Ma Qian*¹; Saied Aminossadati¹; Graham Schaffer¹; ¹The University of Queensland

10:00 AM Invited

Challenges and Further Developments in Modeling of Sintering: *Eugene Olevsky*¹; ¹San Diego State University

10:25 AM Break

10:40 AM Keynote

Stereological Analysis of Microstructural Evolution during Sintering: *Burton Patterson*¹; ¹University of Florida

11:10 AM Invited

A Review on Alloying in Tungsten Heavy Alloys: *Animesh Bose*¹; Rajendra Sadangi²; Randall German³; ¹Materials Processing, Inc.; ²Rutgers University; ³San Diego State University

11:35 AM Invited

Development of Alternate Materials to Cemented Carbides without Tungsten: *Ken-ichi Takagi*¹; ¹Tokyo City University



TMS 2012

141st Annual Meeting & Exhibition

MONDAY AM

Science and Engineering of Light Metal Matrix Nanocomposites and Composites: Metal Matrix Nanocomposites

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division

Program Organizers: Xiaochun Li, University of Wisconsin-Madison; Alan Luo

Monday AM
March 12, 2012

Room: Macaw 2
Location: Swan Resort

Session Chair: Xiaochun Li, University of Wisconsin-Madison

8:30 AM Introductory Comments

8:35 AM

A Unified Theoretical Model for Nanoparticle and Microparticle Capture by Metal Solidification Front: *Jiaquan Xu*¹; Lianyi Chen¹; Xiaochun Li¹; ¹University of Wisconsin-Madison

8:55 AM

Characterization of Solidification of Nanoparticle enforced Al Using In Situ TEM: *Jorg Wieszorek*¹; Hasso Weiland²; Andreas Kulovits¹; Can Liu¹; ¹University of Pittsburgh; ²Alcoa

9:15 AM

Interfacial Analysis of CNT Reinforced AZ61 Mg Alloy Composites: *Katsuyoshi Kondoh*¹; Hiroyuki Fukuda¹; Junko Umeda¹; Bunshi Fugetsu²; ¹Osaka University; ²Hokkaido University

9:35 AM

Magnesium Nanocomposites Processed by Electromagnetic Acoustic Transduction: *Hunter Henderson*¹; Zachary Bryan¹; Orlando Rios²; Gail Mackiewicz-Ludtka²; Alexander Melin²; George Lopp²; Yu-Min Su²; Michele Manuel¹; ¹University of Florida; ²Oak Ridge National Laboratory

9:55 AM

Properties of Aluminum-Graphene Nanocomposites: *Stephen Bartolucci*¹; Joseph Paras¹; Mohammad Rafiee²; Sabrina Lee¹; Javad Rafiee³; Deepak Kapoor¹; Nikhil Koratkar³; ¹US Army ARDEC; ²Rice University; ³Rensselaer Polytechnic Institute

10:15 AM Break

10:30 AM

Biodegradability and Mechanical Performance of Hydroxyapatite Reinforced Magnesium Matrix Nanocomposite: *Chao Ma*¹; Lianyi Chen¹; Jiaquan Xu¹; Axel Fehrenbacher¹; Yan Li¹; Frank Pfefferkorn¹; Neil Duffie¹; Jing Zheng¹; Xiaochun Li¹; ¹UW-Madison

10:50 AM

Mechanical Properties of A356-CNT Cast Nano Composite Produced by a Special Compocasting Route: *Benyamin Abbasipour*¹; *Behzad Niroumand*¹; Sayed Mahmoud Monirvaghefi¹; ¹Isfahan University of Technology

11:10 AM

Production of Cast AZ91-CNT Nano-Composite by Addition of Ni-P-CNT Coated Magnesium Powder to the Melt: *Mahan Firoozbakht*¹; *Behzad Niroumand*¹; *Behzad Niroumand*¹; Sayed Mahmoud Monirvaghefi¹; ¹Isfahan University of Technology

11:30 AM

Wear Behavior of Magnesium Matrix Nanocomposites at Room and Elevated Temperature: *Wenzhen Li*¹; ¹Tsinghua University

11:50 AM

Influence of Nanodispersions on Metallurgical Properties and Performance of Cast AlSi Alloys: *Iman El Mahallawi*¹; Yehia Shash¹; Hoda Abdelkader²; Laila Shehata³; Mohamed Abdelaziz⁴; Asmaa Amer Abdelmegeed³; Joachim Mayer⁵; Alexander Sewed⁵; ¹Cairo University; ²Helwan University; ³Scientific & Technology Centre of Excellence; ⁴The British University in Egypt; ⁵Gemeinschaftslabor fuer Elektronmikroskopie

12:10 PM

Grain Refinement and Mechanical Property Enhancement in As-cast Al-Mg Nanocomposites: *Dake Wang*¹; Michael De Cicco¹; Xiaochun Li¹; ¹University of Wisconsin-Madison

Solid-State Interfaces II: Toward an Atomistic-Scale Understanding of Structure, Properties, and Behavior through Theory and Experiment: Atomic Level Structures, Compositions, and General Methods

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Xiang-Yang Liu, Los Alamos National Lab; Douglas Spearot, University of Arkansas; Guido Schmitz, University of Münster; David Seidman, Northwestern University

Monday AM
March 12, 2012

Room: Oceanic 7
Location: Dolphin Resort

Funding support provided by: Los Alamos National Laboratory

Session Chairs: Alan Ardell, National Science Foundation; Xiang-Yang (Ben) Liu, Los Alamos National Lab

8:30 AM Invited

Grain Boundary Complexion Conformations (Equilibrium Interface-Stabilized Phases) in Materials: *Martin Harmer*¹; ¹Lehigh University

9:00 AM Invited

Defect Structures of Interphase Boundaries in Metallic Nano-Composites: *Amit Misra*¹; Qiangmin Wei¹; Richard Hoagland¹; Xiang-Yang Liu¹; Dhriti Bhattacharyya²; ¹Los Alamos National Laboratory; ²ANSTO

9:30 AM Invited

Structural and Compositional Transitions Across Interfaces in Titanium Alloys (Invited): Soumya Nag¹; Arun Devaraj¹; Robert Williams²; Gopal Viswanathan³; Jaimie Tiley³; Hamish Fraser²; *Rajarshi Banerjee*¹; ¹University of North Texas; ²The Ohio State University; ³Air Force Research Laboratory

10:00 AM Break

10:10 AM

Gradient Energy, Interfacial Energy and Interface Width: an Example from Ni-Base γ/γ' Alloys: *Alan Ardell*¹; ¹National Science Foundation

10:30 AM

Modeling Nickel Surfaces and Grain Boundaries with the Fragment Hamiltonian Model: Helen Telila¹; Susan Atlas²; *Steven Valone*¹; ¹Los Alamos National Laboratory; ²University of New Mexico

10:50 AM

Grain Boundary Diagrams: A New Materials Science Tool: *Jian Luo*¹; Xiaomeng Shi¹; Naixie Zhou¹; ¹Clemson University

11:10 AM

Twin Boundary Structure in Bismuth Telluride: *Douglas Medlin*¹; Q. Ramasse²; C. Spataru¹; N. Yang¹; ¹Sandia National Labs; ²SuperSTEM Laboratory, STFC Daresbury, UK

11:30 AM

A Dislocation-Based Model for Design of Radiation-Tolerant Nanocomposites: *Aurélien Vattré*¹; Michael Demkowicz²; ¹CEA; ²MIT

Symposium in Memory of Patrick Veyssi re: Understanding the Mechanisms Controlling Plastic Flow: Dislocations Organization

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division

Program Organizers: Georges Saada, LEM CNRS ONERA; Dennis Dimiduk, Air Force Research Laboratory; Hael Mughrabi, University Erlangen-Nuernberg; Haruyuki Inui, Kyoto University

Monday AM

March 12, 2012

Room: Europe 6

Location: Dolphin Resort

Funding support provided by: National Science Foundation

Session Chairs: G. Saada, LEM/CNRS/ONERA; R. Yang, Shenyang National Laboratory for Materials Science

8:30 AM Introductory Comments

8:40 AM Invited

Defect Kinetics on Experimental Timescales Using Atomistic Simulations

: Hao Wang¹; *David Rodney*¹; Dongsheng Xu²; Rui Yang²; ¹INP Grenoble; ²Institute of Metal Research

9:20 AM Invited

Atomistic Simulation of the Breaking and Reaction of Dipolar Dislocations under Shear Deformation: *Dongsheng Xu*¹; Hao Wang¹; Rui Yang¹; David Rodney²; Patrick Veyssi re³; ¹Institute of Metal Research, Chinese Academy of Sciences; ²SIMAP-GPM2, INPG; ³LEM, CNRS-ONERA

9:40 AM Invited

Dislocation Organisation in Samples of Different Sizes: *Yu Lung Chiu*¹; ¹University of Birmingham

10:00 AM Break

10:15 AM Invited

Mechanical Behavior and Dislocation Self-Patterning in Fatigued Single Crystalline Silicon: *Marc Legros*¹; ¹CEMES-CNRS

10:45 AM Invited

Mechanisms Controlling Plastic Flow of Silicon High Stress: *Jacques Rabier*¹; ¹CNRS

11:15 AM Invited

An Extended Kocks-Mecking Approach with an Explicit Role of Cross-Slip on the Balance between Isotropic and Kinematic Hardening: First Application to Solutes in Ferrite

: *Olivier Bouaziz*¹; David Barbier¹; J. D. Embury²; Guillaume Badinier³; ¹ArcelorMittal; ²McMaster University; ³University of British Columbia

11:20 AM Invited

Low Cycle Fatigue of Copper Single Crystals under Alien Distribution of Dislocations: *Marek Niewczas*¹; ¹McMaster University

Titanium: Advances in Processing, Characterization and Properties: Processing and Process Modeling I

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Christopher Szczepanski, US Air Force Research Laboratory; Vasisht Venkatesh, Pratt & Whitney

Monday AM

March 12, 2012

Room: Oceanic 3

Location: Dolphin Resort

Session Chairs: Rodney Boyer, Boeing Company; Vasisht Venkatesh, Pratt & Whitney

8:30 AM Invited

The Evolution of "Beta-Titanium Alloys" for the Aerospace Industry:

*Rodney Boyer*¹; James Williams²; John Fanning³; ¹Boeing Company; ²The Ohio State University; ³TIMET

9:00 AM Invited

Integrated Computational Materials Engineering: Recent Progress in the Advanced Titanium Microstructure and Modeling Program:

*Michael Glavicic*¹; Rod Boyer²; Tom Broderick³; Fred Cohen⁴; Yunzhi Wang⁵; Fan Zang⁶; Donald Boyce⁷; Wei-Tsu Wu⁸; Ayman Salem⁹; Ron Wallis¹⁰; Vikas Saraf¹¹; Vasisht Venkatesh¹²; Lee Semiatin¹³; ¹Rolls-Royce Corporation; ²The Boeing Company; ³General Electric Aviation; ⁴Pratt & Whitney; ⁵The Ohio State University; ⁶Computherm; ⁷Cornell University; ⁸Scientific Forming Technologies; ⁹Materials Resources LLC; ¹⁰Wyman-Gordon; ¹¹ATI Ladish Forging; ¹²TIMET; ¹³Air Force Research Laboratory

9:30 AM

Microstructural Evolution and Mechanical Properties of β -Titanium

Ti-10V-2Fe-3Al during Incremental Forming: *Sven Winter*¹; Sebastian Fritsch¹; Martin F.-X. Wagner¹; ¹Chemnitz University of Technology

9:50 AM

Low-cost Ultrafine Grained Titanium Sheet Production by Extrusion-

Machining: Kayla Calvert¹; Wilfredo Moscoso²; Mert Efe³; Dinakar Sagapuram³; Srinivasan Chandrasekar³; *Kevin Trumble*³; ¹University of California San Francisco; ²Pontificia Universidad Catolica Madre y Maestra; ³Purdue University

10:10 AM

Microstructure Evolution during Different Thermal Processing in

Billet of High-Strength Titanium Base Alloy VT43: *Anatoly Yakovlev*¹; Nadezhda Nochovnaya¹; ¹All-Russian Scientific Research Institute of Aviation Materials

10:30 AM Break

10:40 AM

Crystal Plasticity Finite Element Analysis of Hot Deformation of

Ti-6Al-4V with Lamellar Microstructure: *Ayman Salem*¹; Surya Kalidindi²; Jaimie Tiley³; S. Semiatin³; ¹Materials Resources LLC; ²Drexel University; ³Air Force Research Laboratory

11:00 AM

Modeling Superplastic Forming and Diffusion Bonding of Titanium

Alloys: *WeiQi Luo*¹; Jae-Bong Yang¹; Ravi Shankar¹; Wei-Tsu Wu¹; Vasisht Venkatesh²; Yoji Kosaka²; Phani Gudipati²; Daniel Sanders³; Larry Hefti³; ¹Scientific Forming Technologies Corporation; ²Titanium Metals Corporation; ³The Boeing Company

11:20 AM

Finite Element Analysis of the Anisotropic Behavior of Ti6Al4V

during Incremental Sheet Metals Forming: Kazeem Sanusi¹; Emad Uheida¹; *Taan Oosthuizen*¹; ¹University of Stellenbosch,



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MONDAY AM

11:40 AM

Study on Hot Deformation Behavior of TC4 Titanium Alloy: *Yanling Lu*¹; Sihai Jiao²; Xingtai Zhou¹; Anping Dong³; ¹Shanghai Institute of Applied Physics, Chinese Academy of Sciences; ²Baoshan Iron & Steel Co., LTD.; ³Shanghai Jiao Tong University

12:00 PM

Evolution of Microstructures and Properties of Ti-44Al-6V-3Nb-0.3Y Alloy after Forging and Rolling: *Yuyong Chen*¹; Hongzhi Niu¹; Shulong Xiao¹; Ping Sun¹; Changjiang Zhang¹; ¹Harbin Institute of Technology

12:20 PM

Effect of Forging on Microstructural Characteristic and Tensile Properties of In-Situ (TiB+TiC)/Ti Composite: *Yuyong Chen*¹; Changjiang Zhang¹; Shulong Xiao¹; Dezhong Wu¹; Hongzhi Niu¹; ¹Harbin Institute of Technology

T.T. Chen Honorary Symposium on Hydrometallurgy, Electrometallurgy and Materials Characterization: Plenary Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee

Program Organizers: Shijie Wang, Rio Tinto Kennecott Utah Copper; J. E. Dutrizac, CANMET; Michael Free, University of Utah; J. Y. Hwang, Michigan Technological University; Daniel Kim, Rio Tinto Kennecott Utah Copper

Monday AM

March 12, 2012

Room: Northern A4

Location: Dolphin Resort

Funding support provided by: Rio Tinto Kennecott Utah Copper, ASARCO, and Freeport McMoRan

Session Chair: Shijie Wang, Rio Tinto Kennecott Utah Copper

8:30 AM

In Honor of Dr. Tzong T. Chen: John Dutrizac¹; *Shijie Wang*²; ¹CANMET-MMSL; ²Rio Tinto Kennecott Utah Copper

8:45 AM

A Review of the Behavior and Deposition of Lead, Bismuth, Antimony and Arsenic in Copper Electrorefining: *Michael Moats*¹; Shijie Wang²; Daniel Kim²; ¹University of Utah; ²Rio Tinto Kennecott Utah Copper

9:20 AM Plenary

Technological Overview of Zinc Industry – Now and Future: *Takashi Yoshida*¹; ¹Mitsui Mining & Smelting Co., Ltd

9:55 AM Break

10:15 AM Plenary

The Next Decade in Cu, Ni, Co and Platinum Group Metal Extraction: *Bill Davenport*¹; ¹University of Arizona

10:50 AM Plenary

The Development of China's Molybdenum Metallurgical Technologies: *Kaixi Jiang*¹; Wang Haibei¹; Zou Xiaoping¹; Zhang Lei¹; Bangsheng Zhang¹; ¹Beijing General Research Institute of Mining and Metallurgy

11:25 AM Invited

Some Applications of Molecular Recognition Technology (MRT) to the Mining Industry: *Steven Izatt*¹; Ronald Bruening¹; Neil Izatt¹; ¹IBC Advanced Technologies, Inc.

Ultrafine Grained Materials VII: Plenary Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee

Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Xiaoxu Huang, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; Hyoung Seop Kim, POSTECH; Terence Langdon, University of Southern California; Terry Lowe, Manhattan Scientifics, Inc.; Ruslan Valiev, Ufa State Aviation Technical University; Xiaolei Wu, Institute of Mechanics, Chinese Academy of Sciences; Michael Zehetbauer, University of Vienna

Monday AM

March 12, 2012

Room: Swan 5

Location: Swan Resort

Session Chairs: Xiaoxu Huang, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; Suveen Mathaudhu, U.S. Army Research Office; Terry Lowe, Manhattan Scientifics, Inc.; Michael Zehetbauer, University of Vienna

8:30 AM Introductory Comments

8:35 AM Keynote

Physics of Grain-Size Effect on Twinning in Nanostructured fcc Metals: *Yuntian Zhu*¹; Xiaolei Wu²; Xiaozhou Liao³; ¹North Carolina State University; ²Institute of Mechanics; ³The University of Sydney

8:55 AM Invited

Deformation Mechanisms in Nano and Ultrafine Crystalline Nickel: *Marisol Koslowski*¹; ¹Purdue University

9:15 AM Invited

Near Surface Nanoscale Structures Produced by Plastic Deformation: *Niels Hansen*¹; Xiaodan Zhang¹; Yukui Gao²; Xiaoxu Huang¹; ¹Risø DTU; ²Beijing Institute of Aeronautical Materials

9:35 AM Invited

Strain-Induced Phase Transformations under Compression and Shear in Rotational Diamond Anvil Cell: *Valery Levitas*¹; ¹Iowa State University

9:55 AM Invited

Tailoring or Grading Sheet Materials by Using New Concepts in ARB-Processing: *Heinz Werner Höppel*¹; ¹University Erlangen-Nürnberg

10:15 AM Invited

Analysis of Plastic Flow during High-Pressure Torsion: *Roberto Figueiredo*¹; Maria Teresa Aguilar¹; Paulo Cetlin¹; Terence Langdon²; ¹Federal University of Minas Gerais; ²University of Southern California

10:35 AM Break

10:50 AM Invited

Microstructure and Microtexture Evolution in Pure Metals after Ultra-High Straining: *Alexander Zhilyaev*¹; Terence Langdon²; ¹School of Engineering Sciences, University of Southampton, Southampton SO17 1BJ, U.K. and Institute for Metals Superplasticity Problems, Russian Academy of Science, 39 Khalturina, Ufa, 450001 Russia); ²School of Engineering Sciences, University of Southampton, Southampton SO17 1BJ, U.K. and Departments of Aerospace & Mechanical Engineering and Materials Science, University of Southern California, Los Angeles, CA 90089-1453, U.S.A.

11:10 AM Invited

Dilatometry – A Powerful Tool for the Study of Defects in Ultrafine Grained Metals: *Wolfgang Sprengel*¹; Bernd Oberdorfer¹; Eva-Maria Steyskal¹; Roland Würschum¹; ¹Graz University of Technology

11:30 AM Invited

The Combined Effect of Grain Boundaries and Second Phase Particles on the Flow Stress of Nanocrystalline Metals: *Krzysztof Kurzydowski*¹; Romuald Dobosz¹; Malgorzata Lewandowska¹; ¹Warsaw University of Technology

11:50 AM Invited

The Super-Strength of Ultrafine-Grained SPD-Processed Alloys Due to Grain Boundary Segregations: *Nariman Enikeev*¹; Xavier Sauvage²; Maxim Murashkin¹; Ruslan Valiev¹; ¹Ufa State Aviation Technical University; ²University of Rouen, Groupe de Physique des Matériaux, CNRS

12:10 PM Invited

Ultrafine-Grained Shape Memory Alloys: *Thomas Waitz*¹; Clemens Mangler¹; Gerd Steiner¹; Arno Kompatscher¹; Martin Peterlechner²; Wolfgang Pranger³; Thomas Antretter³; Franz Dieter Fischer³; Peter Müllner⁴; ¹University of Vienna; ²University of Muenster; ³University of Leoben; ⁴Boise State University

2012 Functional and Structural Nanomaterials: Fabrication, Properties, Applications and Implications: Nanomaterials for Information Technology

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Jiyoung Kim, University of Texas; David Stollberg, Georgia Tech Research Institute; Seong Jin Koh, University of Texas at Arlington; Nitin Chopra, The University of Alabama; Terry Xu, UNC Charlotte

Monday PM
March 12, 2012

Room: Pelican 1
Location: Swan Resort

Session Chairs: David Stollberg, Georgia Tech Research Institute; HyunJung Shin, Kookmin University

2:00 PM Introductory Comments

2:05 PM Invited

In-Situ Studies of High-K/II-V Interfaces for Advanced Electronics: *R.M. Wallace*¹; ¹Department of Materials Science and Engineering, University of Texas at Dallas

2:40 PM Invited

Stimuli Responsive Field-Effect Transistors Integrated with Nanomaterials: *Nae-Eung Lee*¹; Nguyen Thanh Tien¹; D.-J. Kim¹; I.-Y Sohn¹; Tran Quang Trung¹; O.J. Yoon¹; ¹Sungkyunkwan university

3:15 PM

Interface Engineering as a Tool to Enhance Efficiencies of Carbon Nanotube Based Devices: *Indranil Lahiri*¹; Wombong Choi¹; ¹Florida International University

3:30 PM

In-Situ Electrical Studies on Ozone Functionalization of Graphene: *Srikar Jandhyala*¹; Greg Mordi¹; Jiyoung Kim¹; ¹University of Texas at Dallas

3:45 PM Break

4:00 PM Invited

Nano-Floating Gate Memory Devices: *Jang-Sik Lee*¹; ¹Kookmin University

4:35 PM

Fabrication and Magnetic Properties of Graded Magnetocrystalline Anisotropy Fe(Ni)Pt Nano-Dots: Bianzhu Fu¹; Aaron Gin²; James Harrell¹; *Gregory Thompson*¹; ¹University of Alabama; ²Sandia National Laboratories

4:55 PM

Fabrication of Nanocrystalline InGaZnO Films: The Microstructure and the Device Performance of Their Thin Film Transistors: *Haseok Jeon*¹; Hwayoul Choi¹; Mi Ran Moon¹; Sekwon Na¹; Hyoungsub Kim¹; Hoo-jeong Lee¹; ¹Sungkyunkwan University

5:10 PM

Discovery a Frozen Nano-Domain State in Non-Metallic Ferroelastic System: Yan Ni¹; *Zhen Zhang*¹; Xiaobing Ren²; ¹Frontier Institute of Science and Technology, Xi'an Jiaotong University; ²National Institute for Materials Science, Japan

2012 Symposium on Surfaces and Heterostructures at Nano- or Micro-Scale and Their Characterization, Properties, and Applications: Carbon Nanomaterials and Heterostructures

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Energy Conversion and Storage Committee, TMS: Nanomaterials Committee, TMS: Surface Engineering Committee, TMS: Young Leaders Committee, TMS: EMPMD Council

Program Organizers: Nitin Chopra, The University of Alabama; Ramana Reddy, The University of Alabama; Arvind Agarwal, Florida International University; Sandip Harimkar, Oklahoma State University; Jiyoung Kim, University of Texas at Dallas; Christopher Matranga, National Energy Technology Laboratory

Monday PM
March 12, 2012

Room: Pelican 2
Location: Swan Resort

Session Chairs: Ramana Reddy, The University of Alabama; Nitin Chopra, The University of Alabama

2:00 PM Invited

Application of Carbon Nanotubes – Energy to Bioelectronic Sensor: *Wombong Choi*¹; Indranil Lahiri¹; Santanu Das¹; Chiwon Kang¹; ¹Florida International University

2:35 PM Invited

Vertically Aligned and Periodically Distributed Carbon Nanotube (CNT) Bundles Grown by a Combination of Laser Interference Ablation and Metal-Catalyzed Chemical Vapor Deposition (CVD): *Dajun Yuan*¹; Wei Lin¹; Rui Guo¹; C. P. Wong¹; Suman Das¹; ¹Georgia Institute of Technology

3:10 PM

Structural Evolution and Growth Mechanism of Hierarchical Heterostructures Comprised of Carbon Nanotubes Decorated with Nanoparticles: *Wenwu Shi*¹; Nitin Chopra¹; ¹The University of Alabama

3:30 PM

Synthesis of Porous Graphene Shells with Embedded Noble Metal Nanoparticles: Wenwu Shi¹; Robert Wright¹; *Nitin Chopra*¹; ¹The University of Alabama

3:50 PM

Systematic Studies on the Formation of Graphene on Noble Metal Nanoparticles: *Wenwu Shi*¹; Nitin Chopra¹; ¹The University of Alabama



TMS 2012

141st Annual Meeting & Exhibition

MONDAY PM

4:05 PM Break

4:20 PM

Evolution of Gold Nanoparticles in a High Temperature Process and Patterned Growth of Graphene Encapsulated Nanoparticles: *Junchi Wu*¹; Larry Summerville¹; Nitin Chopra¹; ¹The University of Alabama

4:35 PM

Growth Mechanisms of Graphene Encapsulated Nanoparticle and Effect of Catalyst Shape on the Graphene Growth: *Junchi Wu*¹; *Nitin Chopra*¹; ¹The University of Alabama

4:50 PM Invited

Defects in Carbon Based Nanostructures: Applications to Novel Morphologies and Device Concepts: *Prabhakar Bandaru*¹; ¹UC, San Diego

5:25 PM Invited

Localized Plasmon Enhancement at Dopant Sites in Graphene: *Stephen Pennycook*¹; *Wu Zhou*¹; *Jaekwang Lee*¹; *Jagjit Nanda*¹; *Sokrates Pantelides*²; *Mark Oxley*¹; *Micah Prange*¹; *Juan-Carlos Idrobo*¹; ¹Oak Ridge National Laboratory; ²Vanderbilt University

3rd International Symposium on High Temperature Metallurgical Processing: Reduction and Titanium Production

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Energy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Patrick Masset, TU Freiberg; Onuralp Yucel, Istanbul Technical University; Rafael Padilla, University of Concepcion; Guifeng Zhou, Wuhan Iron and Steel

Monday PM

March 12, 2012

Room: Southern II

Location: Dolphin Resort

Session Chairs: Clemens Schmetterer, TU Freiberg; Ting'an Zhang, Northeastern University

2:00 PM

Preparation of Titanium Alloy from Titania-bearing Blast Furnace Slag: *Rui Huang*¹; *Chenguang Bai*¹; *Xuwei Lv*¹; *Songli Liu*²; ¹College of Materials Science and Engineering, Chongqing University; ²College of Materials Science and Engineering, Pan Zhihua University

2:15 PM

An Overview of Development of Rotary Hearth Furnace and Functions: *Xuefeng She*¹; *Jingsong Wang*¹; *Yihua Han*¹; *Qingguo Xue*¹; ¹University of Science and Technology Beijing

2:30 PM

Basic Research of Direct Pyrolysis Performance of MgCl₂ in Molten State for New Process of Titanium Sponge Production: *Zhang Ting'an*¹; *Lv Guozhi*¹; *Dou Zhihe*¹; *Liu Yan*¹; *Niu Liping*¹; *Zhao Qiuyue*¹; *Sui Lianxu*¹; *He Jicheng*¹; ¹Northeastern University

2:45 PM

Chlorination of Titania Feedstocks: *Samantha Moodley*¹; *Rauf Eric*²; *Aditya Kale*³; *Cevat Kucukaragoz*²; ¹Exxaro Resources; ²University of the Witwatersrand; ³Mintek

3:00 PM

Experimental Study on the Pulverization and Reduction Behavior of Sinter in Oxygen Blast Furnace: *Yihua Han*¹; *Jingsong Wang*¹; *Rongzong lan*¹; *Lintao Wang*¹; *Xiaojian Zuo*¹; *Qingguo Xue*¹; ¹University of Science and Technology Beijing

3:15 PM

Formation of Ti(C,N) in Blast Furnace Slag Bearing High TiO₂: *Shiwei Ma*¹; *Guibao Qiu*¹; *Qingyu Deng*¹; *Hua Wang*¹; ¹College of Materials Science and Engineering, Chongqing University

3:30 PM Break

3:40 PM

Modelling of the thermochemical and thermophysical properties of molten slags in high temperature conversion processes: A multiscale approach: *Yuanyuan Zhang*¹; *Patrick Masset*¹; *Aurélie Jacob*¹; *Clemens Schmetterer*¹; *Ligang Zhang*¹; *Arne Bronsch*¹; *Angus Gray-Weale*¹; ¹TU Bergakademie Freiberg

3:55 PM

Research on Carbonothermal Reduction Behavior of Ilmenite: *Yufeng Guo*¹; *Lirong Chen*¹; *Tao Jiang*¹; *Wenjie Weng*¹; *Feng Chen*¹; ¹Central South University

4:10 PM

Study of Reduction Kinetics of Low Grade Hematite Ore: *Tiejun Chun*¹; *Deqing Zhu*¹; *Jian Pan*¹; *Zhao Qiang*¹; ¹Central South University

4:25 PM

Effect of CaO Addition on Metalthermic Reduction of Strontium Oxide: *Yeliz Demiray*¹; *Onuralp Yücel*¹; ¹Istanbul Technical University

4:40 PM

Production of ZrB₂ Powders from ZrO₂ Containing Dental Implant Wastes: *Samet Yilmaz*¹; *Murat Alkan*¹; *Onuralp Yucel*¹; *Bora Derin*¹; ¹Istanbul Technical University

4:55 PM

Viscosity Evolution of Blast Furnace Slag Bearing Titanium: *Hua Wang*¹; *Guibao Qiu*¹; *Qingyu Deng*¹; *Shiwei Ma*¹; ¹Material Science and Engineering Department, Chongqing University

Advances in Surface Engineering: Alloyed and Composite Coatings: Session II

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee
Program Organizers: Sandip Harimkar, Oklahoma State University; Srinivasa Bakshi, Indian Institute of Technology Madras; Arvind Agarwal, Florida International University

Monday PM

March 12, 2012

Room: Macaw 1

Location: Swan Resort

Session Chair: To Be Announced

2:00 PM Introductory Comments

2:05 PM Invited

Understanding the Origins and Evolution of Residual Stress: *Eric Chason*¹; ¹Div of Engineering

2:30 PM Invited

Elevated Temperature Microstructural Stability of Ni(Cr)-Chromium Carbide Composite Coatings on Stainless Steel: *Graham McCartney*¹; *Yi Ding*¹; *Philip Shipway*¹; ¹University of Nottingham

2:55 PM Invited

3-D Focused Ion Beam Serial Sectioning to Determine Solidification and Wear Mechanisms in Adaptive Composites Coatings: *Jon-Erik Mogonye*¹; *Hamidreza Mohseni*¹; *Sundeep Gopagoni*¹; *Junyeon Hwang*¹; *Jamie Tiley*²; *Rajarshi Banerjee*¹; *Thomas Scharf*¹; ¹The University of North Texas; ²Air Force Research Laboratory

3:20 PM

Role of Yttria Stabilized Zirconia on Fracture Toughness of Plasma Sprayed Aluminum Oxide Composite Coatings: S. Ariharan¹; Anup Keshri²; Arvind Agarwal³; *Kantesh Balani*¹; ¹Indian Institute of Technology Kanpur; ²Vellore Institute of Technology; ³Florida International University

3:40 PM

Microstructure Evolution and Corrosion Behavior in Laser Synthesized Fe-base Amorphous Composite Coating on Structural Steel: *Shravana Katakam*¹; Sameer Paital¹; Narendra Dahotre¹; ¹University of North Texas

4:00 PM Break

4:15 PM

Structural Coatings in Aluminum Alloy Microtruss Materials: *Bosco Yi*¹; Glenn Hibbard¹; ¹University of Toronto

4:35 PM

Understanding Plasma Spraying of Nano Crystalline Cerium Oxide for SOFC Electrolyte: *Virendra Singh*¹; Robert Draper¹; Shashank Saraf¹; Sudipta Seal¹; ¹University of Central Florida

4:55 PM

Laser Cladding of High-Performance CPM Tool Steels on Hardened H13 Hot-Work Tool Steel for Automotive Tooling Applications: *Jianyin Chen*¹; Lijue Xue¹; ¹IMI-National Research Council Canada

5:15 PM

Dynamic Annealing Effect during Filtered Cathodic Vacuum Arc Deposition of DLC Coatings: *Feng Ji Li*¹; Sam Zhang¹; Deen Sun²; ¹Nanyang Technological University/School of Mechanical and Aerospace Engineering; ²Singapore Epsom Industrial Pte Ltd/PVD Department Plating Division

5:35 PM

Electron Beam Deposited Multilayer Optical Interference Coatings Using Oxide Composites: *Ankush Nayak*¹; N Sahoo²; R Tokas²; Arup Biswas²; Nitin Kamble²; ¹National Institute of Technology Karnataka, Surathkal; ²Bhabha Atomic Research Centre, Mumbai

Alumina and Bauxite: Bauxite Digestion

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Benny Raahauge, FLSmidth

Monday PM
March 12, 2012

Room: Northern E3
Location: Dolphin Resort

Session Chair: Yanli Xie, SONavation Inc.

2:00 PM

Characterization of Bauxite and its Minerals by Means of Thermoanalytical Methods: *Ekkehard Post*¹; Bob Fidler²; Dorothea Kwiryn²; Doreen Rapp²; ¹NETZSCH Geraetebau GmbH; ²NETZSCH Instruments North America, LLC

2:20 PM

Study on Application of a New Model for the Kinetics of Diaspore Leaching Process: Li Bao¹; *Ting-An Zhang*²; Anh Nguyen¹; Guozhi Lv¹; Zhihe Dou¹; Yan Liu¹; ¹Northeastern University; ²University of Queensland

2:40 PM

Mechanical Activation of Al-Oxyhydroxide Minerals – Physicochemical Changes, Reactivity and Relevance to Bayer Process: Thomas Alex¹; Rakesh Kumar¹; Sanat Roy²; *Surya Mehrotra*³; ¹National Metallurgical Laboratory (CSIR); ²Indian Institute of Technology, Kharagpur; ³Indian Institute of Technology

3:00 PM

Research on Mechanically Activated Digestion Performance and Kinetics of Diasporic Bauxite: *Lv Guozhi*¹; Zhang Ting'an¹; Ke Xianyao²; Liu Yan¹; Dou Zhihe¹; Li Yan¹; He Jicheng¹; ¹Northeastern University; ²Shenyang Aluminum&Magnesium Engineering&Research Institute

3:20 PM

Mechanochemical Activation to Bauxite: *Fernanda Silva*¹; Carla Barbato²; Rachel Santos¹; Diego Seixas³; João Sampaio⁴; Marta Medeiros¹; Francisco Garrido¹; ¹IQ/UFRJ; ²COPPETEC; ³IQ/UFRJ-CETEM; ⁴CETEM/MCT

3:40 PM

Effects of Roasting Pretreatment in Intense Magnetic Field on Digestion Performance of High Iron Bauxite: *Lv Guozhi*¹; Zhang Ting'an¹; Zhang Xuhua¹; Liu Yan¹; Dou Zhihe¹; Li Yan¹; He Jicheng¹; ¹Northeastern University

4:00 PM

Effect of Chamosite on Bayer Process of Diasporic Bauxite with High Silica: *Cao Wenzhong*¹; Xun Zhang²; Weiwei Tian²; Hong Zhong³; ¹Environmental and chemical engineering institute, Nanchang university; ²Environmental and Chemical Engineering Institute, Nanchang University; ³Henan Company of Aluminium Corp. of China

4:20 PM

The Economical Flexibility for Processing Diasporic Bauxite: *Zhang Baiyong*¹; Zhou Fenglu¹; Guo Shen¹; Liao Xinqin¹; Ma Chaojian¹; Dong Yafeng¹; ¹Chalieco

4:40 PM

Turkey Morcukur Bauxite Processing at ETI Aluminium: *Meral Baygul*¹; Sedat Aslan¹; Burak Ozen¹; Serkan Ertugral¹; Carlos Suarez²; ¹Eti Aluminium Co.; ²Hatch Associates Consultant Inc

Aluminium Processing: Rolling

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Processing Committee
Program Organizers: Kai Karhausen, Hydro Aluminium Rolled Products GmbH; Edward Williams, Alcoa

Monday PM
March 12, 2012

Room: Europe 1
Location: Dolphin Resort

Session Chair: Kai Karhausen, Hydro Aluminium Rolled Products

2:00 PM Introductory Comments

2:05 PM

Implementation of a Combined Work-Hardening, Recovery and Recrystallization Model into a Through-Process-Model for Production of Aluminum Sheet: *Thiemo Brüggemann*¹; Anna Rott²; Volker Mohles²; Günter Gottstein²; Kai Karhausen³; ¹Institute of Physical Metallurgy and Metal Physics; ²Institute of Physical Metallurgy and Metal Physics, RWTH-Aachen University; ³Hydro Aluminium Deutschland GmbH

2:25 PM

Comparative Microstructure and Texture Evolution in the AA1050 Aluminum Alloy Sheets Produced by DC and CC Methods: *Heber Otomar*¹; Ronald Plaut²; ¹VM - CBA; ²EPUSP



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2:45 PM

Study on Mechanical Properties of 2024 Al Sheet Treated by SMAT and Hot/Cold Rolling: *Ka Po Cheung*¹; San-Qiang Shi¹; Jian Lu²; ¹The Hong Kong Polytechnic University; ²City University of Hong Kong

3:05 PM

Effects of Asymmetrical Roll Bonding on Microstructure, Chemical Phases and Property of Copper/Aluminum Clad Sheet: *Xiaobing Li*¹; Guoyin Zu²; Ping Wang³; Rong Xu⁴; ¹School of Materials and Metallurgy, Northeastern University ; ²School of Materials and Metallurgy, Northeastern University; ³Key Laboratory of Electromagnetic Processing of Materials, Ministry of Education, Northeastern University; ⁴The State Key Laboratory of Rolling and Automation, Northeastern University

3:25 PM Question and Answer Period

3:35 PM Break

4:05 PM

Influence of Microstructure Representation on Flow Stress and Grain Size Prediction in A5XXX Alloys: *Johannes Lohmar*¹; Markus Bambach¹; Gerhard Hirt¹; Kai Karhausen²; ¹RWTH Aachen University; ²Hydro Aluminium Rolled Products GmbH

4:25 PM

Influence of Pre-Strain on Formability of AA3XXX Aluminum Alloy: *Yansheng Liu*¹; Xiyu Wen²; Shridas Ningileri¹; ¹SECAT Inc; ²University of Kentucky

4:45 PM

From Molten Metal to 3.2 mm Wire for Mechanical Applications: *Giuseppe Marcantoni*¹; ¹Properzi International, Inc.

5:05 PM Question and Answer Period

Aluminum Alloys: Fabrication, Characterization and Applications: Solidification

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Processing Committee
Program Organizers: Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum

Monday PM
March 12, 2012

Room: Northern E1
Location: Dolphin Resort

Session Chair: Hiromi Nagaumi, Suzhou Research Institute for Nonferrous Metals

2:00 PM

Effects of Cu, Mg, and Sr Additions on the Mechanical Properties and Machinability of Near-Eutectic Al-11%Si Casting Alloys: Yasser Zedan¹; Agnes Samuel¹; *Fawzy Samuel*¹; Saleh Alkahtani²; ¹UQAC; ²AlKharj University

2:20 PM

Evolution of Iron Based Intermetallic Phases in Al-7wt%Si Hypoeutectic Alloy: *Anton Gorny*¹; Sumanth Shankar¹; ¹McMaster University

2:40 PM

A New Approach to Producing Large-Size AA 7055 Aluminum Alloy Ingots: Haitao Zhang¹; *Jianzhong Cui*¹; Hiromi Nagaumi²; ¹Northeastern University; ²Suzhou Institute for Nonferrous Metals Research

3:00 PM

Thermal Analysis and Microstructures of Modified Grain-Refined Al-7Si-Mg Cast Alloy: *Adel Mohamed*¹; FH Samuel¹; Saleh Al kahtani¹; ¹UQAC

3:20 PM

Effect of Solidification Velocity and Hydrogen Content on Porosity in Directionally Solidified A356 Castings: Hengcheng Liao¹; *Qigui Wang*²; Wan Song¹; Lei Zhao¹; Ran Fan¹; ¹Southeast University; ²GM Global Powertrain Engineering

3:40 PM

Grain Refiner for Aluminium-Silicon Sand Casting Alloys: *Magdalena Nowak*¹; Hari Babu Nadendla¹; ¹Brunei University

4:00 PM Break

4:15 PM

Novel Casting Process of Developing a Carbon Modified Hyper-Eutectic Wear Resistant Aluminum-Silicon Alloy for the Forging Process: *Kuldeep Agarwal*¹; Rajiv Shivpuri¹; Matthew Blankenhorn²; ¹Ohio State University; ²Aluminastic Corporation

4:35 PM

Solidification Analysis of the Hypereutectic Al-Si Alloys with Addition of Cu and Mg Using Neutron Diffraction: *Dimitry Sediako*¹; Wojciech Kasprzak²; ¹National Research Council Canada ; ²MTL-Canmet, NRCan

4:55 PM

Refinement of Primary and Eutectic Silicon Phases in the Shape Casting of Hyper-Eutectic Al-Si Alloys: *Mohammad Shamsuzzoha*¹; ¹University of Alabama

5:15 PM

Analysis of Thermal and Structural Parameters and Microhardness Variations in Different Al-Cu Alloys Directionally Solidified: Carlos M. Rodriguez¹; Adriana E. Candia²; *Carlos E. Schvezov*¹; Mario R. Rosenberger¹; Alicia Ares¹; ¹CONICET/FCEQyN-UNaM; ²FCEQyN-UNaM

Aluminum Reduction Technology: Environment I

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Olivier Martin, Rio Tinto Alcan

Monday PM
March 12, 2012

Room: Southern III
Location: Dolphin Resort

Session Chair: Margaret Hyland, Light Metals Research Center

2:00 PM Panel Discussion Organized by Margaret Hyland, Stephan Broek: Environmental challenges for large smelters, - Views of key issues from legislators, Environmental technologies to address Sulfur and Fluoride

3:20 PM Break

3:40 PM

Low Cost Video Emissions Monitoring Technique for Aluminum Smelting Applications: *Michael Gershenzon*¹; Neal Dando¹; Nathan Westendorf¹; Steve Lindsay¹; ¹Alcoa

4:00 PM

Electrolytic Cell Gas Cooling Upstream of Treatment Center: Bernard Cloutier¹; Thierry Malard²; El Hani Bouhabila²; Fabienne Virieux³; *Philippe Martineau*¹; ¹Solios Environnement Inc; ²Solios Environnement SA; ³Fives Solios

4:20 PM

Jet Induced Boosted Suction System for Roof-Vent Emission Control: New Developments and Perspectives: *Jean-Nicolas Maltais*¹; Michel Meyer¹; Mathieu Leduc¹; Hyacinthe Rollant¹; ¹Rio Tinto Alcan

4:40 PM

HF Emission Reduction from Anode Butts Using Covered Trays:

Jean-Pierre Gagne¹; René Minville Minville¹; Neal Dando²; Mike Gershenson²; Steve Lindsay³; Harold Frenette⁴; Alain Moras⁴; Gilles Dufour⁴; ¹STAS; ²Alcoa Technical Center; ³Alcoa TN; ⁴Alcoa Canada, Aluminerie Deschambault

Atomistic Effects in Migrating Interphase Interfaces - Recent Progress and Future Study: Interfacial Structure with Large Misfit and Deformation-induced Migration

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee
Program Organizers: Tadashi Furuohara, Institute for Materials Research, Tohoku University; Sudarsanam Babu, Ohio State University; Hatem Zurob, McMaster University; Jian-Feng Nie, Monash University; Wen-Zheng Zhang, Tsinghua University; James Howe, University of Virginia

Monday PM
March 12, 2012

Room: Europe 3
Location: Dolphin Resort

Session Chairs: Robert Pond, University of Exeter; Jian-Feng Nie, Monash University

2:00 PM Invited

Atomistic Structure and Energetics of the θ' (Al₂Cu) – Aluminium Interface: *Laure Bourgeois¹; Christian Dwyer¹; Matthew Weyland¹; Jian-Feng Nie¹; Barrington Muddle¹; ¹Monash University*

2:30 PM

Crystallography and Interfacial Energy of Al₆(Fe,Mn) Dispersoids Precipitated in AA5182 Alloy: *Yanjun Li¹; Jesper Friis¹; Wenzheng Zhang²; Lars Arnborg³; ¹SINTEF Materials and Chemistry; ²Department of Materials Science and Engineering, Tsinghua University; ³Department of Materials Science and Engineering, NTNU*

2:50 PM

Interfacial Disconnections at Sb₂Te₃ Precipitates in PbTe: Mechanisms of Strain Accommodation and Phase Transformation at a Tetradyrite/Rocksalt Telluride Interface
: Douglas Medlin¹; N. Heinz²; T. Ikeda²; G. Snyder²; ¹Sandia National Labs; ²California Institute of Technology

3:10 PM Break

3:30 PM Invited

Interface Facets in Systems with Large Lattice Misfit: *Wenzheng Zhang¹; Zhangzhi Shi¹; Xiaopeng Yang¹; ¹Tsinghua University*

4:00 PM

A Study of Plastic Strain Accommodation during Phase Transformation: *Michael Kuba¹; David Van Aken¹; ¹Missouri University of Science and Technology*

4:20 PM

Grain Rotation and Transformation of Austenite Grains upon Straining of a Si-Alloyed TRIP Assisted Steel: *Ganesh Kumar Tirumalasetty¹; Marijn A Van Huis²; Cees Kwakernaak³; Jilt Sietsma³; Wim G Sloof³; Henny W Zandbergen⁴; ¹Materials Innovation Institute (M2i)/ Kavli Institute of Nanoscience, Delft University of Technology; ²Kavli Institute of Nanoscience, Delft University of Technology/EMAT, University of Antwerp; ³Department of Materials Science and Engineering, Delft University of Technology; ⁴Kavli Institute of Nanoscience, Delft University of Technology*

4:40 PM

Strain Glass Caused by Nano-Scale Randomness -- Strain Glass Transition in Low-Temperature-Aged Ti48.7Ni51.3 Alloy: *Yuanchao Ji¹; Xiaobing Ren¹; Xiangdong Ding²; ¹National Institute of Materials Science; ²Los Alamos National Laboratory*

Biological Materials Science Symposium: Mechanical Behavior of Biological Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Nima Rahbar, University of Massachusetts Dartmouth; Candan Tamerler, University of Washington; Po-Yu Chen, University of California, San Diego; Molly Gentleman, Texas A&M University

Monday PM
March 12, 2012

Room: Swan 7
Location: Swan Resort

Session Chairs: Po-Yu Chen, National Tsing Hua University; Candan Tamerler, University of Washington

2:00 PM Invited

A Model for Diffuse Axonal Injury: *K Ramesh¹; ¹Johns Hopkins University*

2:30 PM

Nanoscale Structural and Mechanical Characterization of Conch Shells: *Haoze Li¹; Zhi-Hui Xu¹; Xiaodong Li¹; ¹University of South Carolina*

2:50 PM

Structure and Mechanical Behavior of the Dasypus Novemcinctus Shell: *Hongjoo Rhee¹; Mark Horstemeyer¹; ¹Center for Advanced Vehicular Systems, Mississippi State University*

3:10 PM

Self Healing Characteristics of Human Enamel: *Camilo Rivera¹; Dwayne Arola¹; Alex Ossa¹; ¹Eafit University*

3:30 PM

Modeling Human Eye under Shock Loading: *Nicola Bonora¹; Luca Esposito¹; Chiara Clemente¹; Tommaso Rossi²; ¹University of Cassino; ²Ospedale Oftalmico di Roma*

3:50 PM Break

4:00 PM Invited

Structure and Mechanical Behavior of Fish Scales: *Wen Yang¹; Yen-Shan Lin²; Jianan Li³; Po-Yu Chen⁴; Maria Lopez¹; Vincent Sherman¹; Eugene Olevsky²; Marc Meyers¹; ¹University of California, San Diego; ²San Diego State University; ³Shanghai Jiao Tong University; ⁴National Tsing Hua University*

4:30 PM

Structural and Mechanical Design of Zebra Shark Teeth: *Hao-Jen Fang¹; Chang-Yu Sun¹; Yao-Tien Ku¹; Po-Yu Chen¹; ¹National Tsing Hua University*

4:50 PM

Structure and Mechanical Properties of Alligator Osteoderms: *Irene Chen¹; Marc Meyers¹; ¹University of California at San Diego*

5:10 PM

A Comparative Study of the Compressive Mechanical Properties of Young and Old Bovine Cortical Bone: *Ekaterina Novitskaya¹; Zherrina Manilay¹; Steve Lee¹; Joanna McKittrick¹; ¹UCSD*

MONDAY PM



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Bulk Metallic Glasses IX: Alloy Development and Mechanical Properties

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

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

Monday PM Room: Swan 6
March 12, 2012 Location: Swan Resort

Session Chairs: C. Liu, Hong Kong Polytechnic University; Y. Yokoyama, Institute for Materials Research

2:00 PM Keynote

Atomic Structures and Mechanical Properties of Bulk Metallic Glasses: *C. T. Liu*¹; Yong Yang²; X. J. Liu²; ¹City University of Hong Kong; ²Hong Kong Polytechnic University

2:30 PM

Production and Mechanical Properties of Roll Bonded Bulk Metallic Glass/Aluminium Laminates: *Daniel East*¹; Mark Gibson¹; Daniel Liang¹; Jian-Feng Nie²; ¹CSIRO; ²Monash University

2:40 PM Invited

Micro-Scale Moldability and Mechanical Properties of Hypoeutectic Zr-Based Metallic Glasses: Sae Takashima¹; T. Yamasaki¹; K. Fujita²; A. R. Yavari³; A. Inoue⁴; *Y. Yokoyama*⁵; ¹University of Hyogo; ²Ube National College of Technology; ³SIMAP-CNRS; ⁴Tohoku University; ⁵University of Tennessee

3:00 PM Invited

Structural Order and Density in Bulk Metallic Glass Forming Liquids: *Ken Kelton*¹; James Bendert¹; Anup Gangopadhyay¹; Nicholas Mauro¹; ¹Washington University

3:20 PM Break

3:35 PM Invited

Amorphous Multilayers in the Al-Mn System: Wenjun Cai¹; Shiyun Ruan¹; *Christopher Schuh*¹; ¹MIT

3:55 PM Invited

The Role of Cu in an Iron-Based Bulk Metallic Glass: *Michael Miller*¹; J. Gao²; Y. Wu²; Z. Lu²; ¹Oak Ridge National Laboratory; ²University of Science and Technology Beijing

4:15 PM

Glass Formation and Properties of Fe- and Co-Based Ternary Bulk Metallic Glasses: Jianfeng Wang¹; *Ran Li*¹; Tao Zhang¹; ¹Beihang University

4:25 PM Invited

Metallic Glass Wireless Biosensors for Pathogen Detection: Suiqiong Li¹; Shin Horikawa¹; Yating Chai¹; *Bryan Chin*¹; ¹Auburn University

4:45 PM

Metallic Glasses for Electro-Catalytic Applications: *Sundeep Mukherjee*¹; Marcelo Carmo¹; Golden Kumar¹; Andre Taylor¹; Jan Schroers¹; ¹Yale University

4:55 PM Invited

Impact of Secondary Amorphous Phases on Properties of Metallic Glasses: *Eun Soo Park*¹; ¹Seoul National University

5:15 PM

Formation and Magnetic Properties of New CoTiZrCo Bulk Amorphous and Nanocrystalline Composites: *Yang Yuanzheng*¹; Qiu Junhua¹; Chen Xianchao¹; Xie Zhiwei¹; ¹Guangdong University of Technology

5:25 PM

Fabrication of Mg-Based Amorphous Composites: *Junhua You*¹; ¹Shenyang University of Technology

CFD Modeling and Simulation in Materials Processing: CFD Modeling in Materials Processing II

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Laurentiu Nastac, The University of Alabama; Lifeng Zhang, Missouri University of Science and Technology; Brian Thomas, University of Illinois at Urbana-Champaign; Adrian Sabau, Oak Ridge National Lab ; Nagy El-Kaddah, The University of Alabama; Adam Powell, Metal Oxygen Separation Technologies, Inc.; Hervé Combeau, Institut Jean Lamour

Monday PM Room: Asia 4
March 12, 2012 Location: Dolphin Resort

Session Chairs: Adam Powell, Metal Oxygen Separation Technology; Adrian Sabau, Oak Ridge National Lab

2:00 PM Keynote

Multi-Physics Modeling of Molten Salt Transport in Solid Oxide Membrane (SOM) Electrolysis and Recycling of Magnesium: *Adam Powell*¹; Soobhankar Pati¹; ¹Metal Oxygen Separation Technologies, Inc.

2:25 PM Invited

Numeric Modeling for the Carbothermic Aluminum Process: *David Roha*¹; ¹Alcoa

2:50 PM Invited

A Coupled CFD-PBE Approach Applied to the Simulation of the Inclusion Behavior in a Steel Ladle: *Jean-Pierre Bellot*¹; Valerio De Felice¹; Ismael L. A. Daoud¹; Alain Jardy¹; ¹Institut Jean Lamour

3:15 PM Invited

Multiphysics CFD Modeling of a Free Falling Jet during Melt-Blowing Slag Fiberization: *Dimitrios Gerogiorgis*¹; Dimitrios Panias¹; Ioannis Paspaliaris¹; ¹National Technical University of Athens (N.T.U.A.)

3:40 PM Break

4:00 PM

Direct Numerical Simulation of Inclusion Turbulent Deposition at Liquid Metal/Slag Interface: *Arunvady Xayasenhi*¹; Laurent Joly²; Hervé Duval¹; ¹Laboratoire de Génie des Procédés et Matériaux (LGPM) - Ecole Centrale Paris; ²Département Aérodynamique, Énergétique et Propulsion (DAEP) - Institut supérieur de l'aéronautique et de l'espace

4:20 PM

A Numerical Simulation of the Influence of Droplet Impact Dynamics on the Microstructure of Plasma Sprayed Coatings: *Jeffrey Yanke*¹; Rodney Trice¹; Matthew Krane¹; ¹Purdue Center for Metal Casting Research, School of Materials Engineering, Purdue University

4:40 PM

CFD Calculation of Nitrogen Gas Quenching for Steel Ring Gears:Junsheng Wang¹; Xuming Su¹; Mei Li¹; Ronald Lucas¹; William Dowling¹; ¹Ford Motor Company

5:00 PM

Numerical Simulation of Erosion Using Computational Fluid Dynamics:Harpreet Grewal¹; Harpreet Singh¹; Anupam Agarwal¹; ¹Indian Institute of Technology Ropar

5:20 PM

A CFX-based Model of Ironmaking Blast Furnace Considering Layered Cohesive Zone:Yansong Shen¹; Baoyu Guo¹; Aibing Yu¹; Sheng Chew¹; Peter Austin¹; ¹UNSW

5:40 PM

Modelling Pulverized Coal Injection in a Blast Furnace:Yansong Shen¹; Aibing Yu¹; Paul Zulli¹; ¹UNSW

Characterization of Minerals, Metals, and Materials: Characterization of Non-Ferrous Materials*Sponsored by:*The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Materials Characterization Committee*Program Organizers:* Jiann-Yang Hwang, Michigan Technological University; Sergio Montero, State University of North Rio De Janeiro; Chenguang Bai, Chongqing University; John Carpenter, US Department of Energy; Donato Firrao, Politecnico di Torino; Byoung-Gon Kim, Korea Institute of Geoscience & Mineral Resources; Mingdong Cai, Schlumberger

Monday PM

March 12, 2012

Room: Asia 2

Location: Dolphin Resort

Session Chairs: Igor Bunin, Research Institute of Comprehensive Exploitation of Mineral Resources RAS; Byoung-Gon Kim, Korea Institute of Geoscience & Mineral Resources

2:00 PM

Characterization of New Phases in the Ti-Pt System:Karem Tello¹; Anita Garg²; Ronald Noebe²; Michael Kaufman¹; ¹Colorado School of Mines; ²NASA Glenn Research Center

2:15 PM

Characterization of Sn Whiskering by In Situ Nanoindentation in a Scanning Electron Microscope:Nicholas Chapman¹; Jason Williams¹; Nikhilesh Chawla¹; ¹Arizona State University

2:30 PM

Columnar Microstructural Architecture in Electron and Laser Beam Melting of Metals and Alloys:Edwin Martinez¹; Lawrence Murr¹; Sara Gaytan¹; Krista Amato¹; Patrick Shindo¹; Diana Ramirez¹; Francisco Medina¹; Jose Martinez¹; Brenda Machado¹; Ryan Wicker¹; ¹University of Texas at El Paso

2:45 PM

Effects of Microstructural Changes on Shape Memory Properties of CuZnNi Shape Memory Alloys:Sathish S¹; U S Mallik²; Raju T N¹; ¹Dr. Ambedkar Institute of Technology; ²Siddaganga Institute of Technology

3:00 PM

Effects of Texture and Extrusion Velocity on the High Strain Tensile Behavior of Zr:Juan Escobedo¹; Ellen Cerreta¹; Carl Trujillo¹; Daniel Martinez¹; Victoria Webster¹; George Gray III¹; ¹Los Alamos National Laboratory

3:15 PM Break

3:25 PM

Improvement of Mechanical Properties in Severely Plastically Deformed Ni-Cr Alloy:Kuk Hyun Song¹; Han Sol Kim¹; Hyun Taek Son¹; Won Yong Kim¹; ¹Korea Institute of Industrial Technology

3:40 PM

Microstructure Development of Nickel Matrix/Carbide Composites:Ayodeji Apata¹; ¹Wits

3:55 PM

Microstructures and Mechanical Properties of Ni-Base Superalloys Fabricated by Laser and Electron Beam Melting:K. Amato¹; S.M. Gaytan¹; L.E. Murr¹; P.W. Shindo¹; J. Hernandez¹; S. Collins²; F. Medina²; ¹The University of Texas at El Paso; ²W.M. Keck Center for 3-D innovation

4:10 PM

Processing and Microstructural Control of Copper Foams for Thermal Wick Material Systems:Keri Ledford¹; Stephanie Lin²; Jason Nadler¹; ¹Georgia Tech Research Institute; ²Georgia Institute of Technology School of Material Science

4:25 PM

Microstructure and Mechanical Properties of Laser-Deposited Cu-30Ni Alloy:Guru Dinda¹; Darryl Menifee¹; Joseph Simpson¹; Ashish Dasgupta¹; Sudip Bhattacharya²; Jyoti Mazumder²; ¹Focus: HOPE; ²University of Michigan

4:40 PM

Deformation Mechanisms at Varying Temperatures in Alloy 718:Donald McAllister¹; Ning Zhou¹; Ben Peterson²; Michael Mills¹; ¹The Ohio State University; ²Honeywell Aerospace

Computational Thermodynamics and Kinetics: In Honor of Dr. Long-Qing Chen, EMPMD Outstanding Scientist: Session II*Sponsored by:*The Minerals, Metals and Materials Society, 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, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Phase Transformations Committee, TMS: Process Technology and Modeling Committee*Program Organizers:* Zi-Kui Liu, The Pennsylvania State University; Mark Asta, University of California, Berkeley; James Warren, The National Institute of Standards and Technology; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yu Wang, Michigan Tech

Monday PM

March 12, 2012

Room: Australia 3

Location: Dolphin Resort

Session Chairs: Yu Wang, MTU; Peter Voorhees, Northwestern University

2:00 PM Invited

Phase Field Modeling and Simulation of Critical Nuclei Morphology:Qiang Du¹; ¹Penn State Univ

2:25 PM Invited

Coarsening of Bicontinuous Two-Phase Mixtures:C. Park¹; K. Thornton¹; Peter Voorhees²; ¹University of Michigan; ²Northwestern University



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2:50 PM Invited

Meso-Scale Phase-Field Simulation of Void Evolution and Swelling in Irradiated Materials: *Shenyang Hu*¹; Yulan Li¹; Charles Henager¹; Richard Kurtz¹; Xin Sun¹; Moe Khaleel¹; ¹PNNL

3:15 PM Invited

Modeling of Hydride Formation and Fracture in Zirconium: *San-Qiang Shi*¹; ¹The Hong Kong Polytechnic University

3:40 PM Break

4:10 PM Invited

Diffuse Interface Field Approach to Modeling and Simulation of Colloid Systems: *Yu Wang*¹; Tian-Le Cheng¹; Paul Millett²; ¹Michigan Tech; ²Idaho National Laboratory

4:35 PM Invited

Ostwald Goes to Hollywood: Time-Resolved 3D Study of Microstructural Coarsening by X-Ray Tomography: Thomas Werz¹; Carl Krill¹; ¹Ulm University

5:00 PM Invited

Computational Modeling of Oxidation and Corrosion of Alloys in Complex Environments: *Youhai Wen*¹; Kaisheng Wu²; Long-Qing Chen³; Jeff Hawk¹; ¹National Energy Technology Laboratory; ²NETL/URS; ³Penn State University

Defects and Properties of Cast Metals: Porosity

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Mark Jolly, University of Birmingham; Brian Thomas, University of Illinois at Urbana-Champaign; Carl Reilly, University of British Columbia

Monday PM

March 12, 2012

Room: Oceanic 4

Location: Dolphin Resort

Session Chairs: Carl Reilly, UBC; Salem Seifeddine, University of Jonkoping

2:00 PM

Effect of Porosity on Deformation, Damage, and Fracture of Cast Steel: *Christoph Beckermann*¹; Richard Hardin¹; ¹University of Iowa

2:25 PM

Detection and Influence of Shrinkage Pores and Non-Metallic Inclusions on Fatigue Life of Cast Aluminum Alloys: *Yakub Tijani*¹; Andre Heinrietz¹; Wolfram Stets²; Patrick Voigt²; ¹Fraunhofer LBF; ²Institut fuer Giessereitechnik

2:50 PM

Quantifying Fe-Rich Intermetallic Formation and Subsequent Pore Interaction during Solidification of Al Alloys Using *in situ* Synchrotron-Based Tomographic Microscopy: *Chedtha Puncreobutr*¹; André Phillion²; Julie L. Fife³; Peter D. Lee⁴; ¹Imperial College London; ²University of British Columbia; ³Paul Scherrer Institut; ⁴The University of Manchester

3:15 PM

An Integrated Methodology for Optimizing Al-Si Diecastings in Automotive Applications Part 1 – Modeling the Influence of Casting Defects: Nicola Gramegna¹; Franco Bonollo²; Giulio Timelli²; Stefano Ferraro²; Gianluca Quaglia¹; ¹ENGINSOFT S.p.A.; ²University Of Padova

3:40 PM Break

4:00 PM

The Influence of Bismuth on Microstructure and Porosity Formation in Hypoeutectic Aluminium-Silicon Alloys: *Jozef Kasala*¹; Lubomir Caplovic²; Maria Lickova¹; ¹Alexander Dubcek University of Trencin; ²Slovak University of Technology in Bratislava

4:25 PM

Relationship between Pores Volume (by Density Measurements) and Pores Area (on Fracture Surfaces) of A356 Fatigue Specimens: *Alessandro Morri*¹; Lorella Ceschini¹; Ingvar Svensson²; Salem Seifeddine²; ¹University of Bologna; ²Jönköping University

4:50 PM

Non Homogenous Microstructure of Cast Iron Components – Challenge for Fatigue Evaluation of NDT Tested “Defect Free” Components: *Andre Heinrietz*¹; Jens Eufinger¹; Wolfram Stets²; Andreas Sobota²; Herbert Loeblich²; ¹Fraunhofer Institute of Structural Durability and System Reliability LBF; ²Institut fuer Giessereitechnik gGmbH

5:15 PM

Fabrication of Ordered Porous Copper Alloy by Continuous Unidirectional Solidification: *Qinglin Jin*¹; Yehua Jiang¹; Rong Zhou¹; ¹Kunming University of Science and Technology

Deformation, Damage, and Fracture of Light Metals and Alloys: Session I

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Light Metals Division, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Qizhen Li, University of Nevada, Reno; Fuqian Yang, Univ. of Kentucky; Ke An, Oak Ridge National Laboratory

Monday PM

March 12, 2012

Room: Northern A2

Location: Dolphin Resort

Session Chairs: Qizhen Li, University of Nevada, Reno; Wen-Ming Chien, University of Nevada, Reno

2:00 PM Invited

Strategies for Improving the Strength and Ductility of Nanostructured Light Metals: *Yuntian Zhu*¹; Yonghao Zhao²; ¹North Carolina State University; ²Nanjing University of Science and Technology

2:30 PM

Ultrafine Grained Aluminium Alloys: Processes and Superior Properties: Maxim Murashkin¹; Georgiy Raab¹; *Ruslan Valiev*¹; ¹Ufa State Aviation Technical University

2:50 PM

Effect of Microalloying with Aluminum or Yttrium on Grain Boundary Damping in Fine-Grained Magnesium: *Hiroyuki Watanabe*¹; Akira Owashi²; Tokuteru Uesugi²; Yorinobu Takigawa²; Kenji Higashi²; ¹Osaka Municipal Technical Research Institute; ²Osaka Prefecture University

3:10 PM

Characterization of Ductile Fracture in 5083 Aluminum using Micro Computed X-Ray Tomography: *Caroline Scheck*¹; Marc Zupan²; ¹Naval Surface Warfare Center; ²University of Maryland, Baltimore County

3:30 PM Break**3:40 PM Invited**

Joint Ab-Initio and Experimental Study on the Effects of Rare Earth (RE) Elements on the Stacking Fault Energy and Plasticity of Magnesium Alloys: Stefanie Sandlöbes¹; Martin Friak¹; Alexej Dick¹; Stefan Zaeferrer¹; Jörg Neugebauer¹; *Dierk Raabe*¹; ¹Max-Planck-Institut

4:10 PM

Abnormal Mechanical Properties of Strain Glass Alloys-A Simulation Study: *Dong Wang*¹; Yunzhi Wang²; Xiaobing Ren³; ¹Xi'an Jiaotong University; ²Ohio State University; ³National Institute for Materials Science

4:30 PM

Warm Forming Simulation of Magnesium Alloy AZ31B Sheets: *Ji Hoon Kim*¹; Daeyong Kim¹; Young-Seon Lee¹; Myoung-Gyu Lee²; R. Wagoner³; ¹Korea Institute of Materials Science; ²Pohang University of Science and Technology; ³The Ohio State University

4:50 PM

A Systematic Study of Solute Effects on Strength and Ductility of Mg from First Principles: *Joseph Yasi*¹; Louis Hector²; Dallas Trinkle¹; ¹University of Illinois at Urbana-Champaign; ²General Motors R&D Center

5:10 PM

A Macroscopic Yield Function Coupled with Crystal Plasticity Theory for Modeling Forming of AZ31 Magnesium Alloy Sheets: *Nitin Chandola*¹; Oana Cazacu¹; Raja Mishra²; Kaan Inal³; ¹University of Florida; ²General Motors; ³University of Waterloo

Electrode Technology for Aluminium Production: Paste Plant Design and Improvement

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee

Program Organizer: Morten Sorlie, Alcoa Norway

Monday PM
March 12, 2012

Room: Americas Seminar
Location: Dolphin Resort

Session Chair: Berthold Hohl, Eirich GmbH & Co KG

2:00 PM Introductory Comments**2:10 PM**

Adaptive Fuzzy Controller for Ball Mill in Anode Plant: *Edson Cruz*¹; ¹Albras - Alumínio Brasileiro S.A.

2:35 PM

Use of under Calcined Coke to Produce Baked Anodes for Aluminium Reduction Lines: Rajesh Garg¹; *Daniel Sulaiman*¹; ¹Aluminium Bahrain

3:00 PM

60 TPH Single Line Green Anode Plant Commissioned at Qatalum: *Christophe Bouche*¹; Bertrand Somnard¹; Sunil Bhajun²; Fabienne Virieux³; ¹Solios Carbone; ²Qatalum; ³Fives Solios

3:25 PM

Improvement of Anode Paste Quality and Performance of ALCOA Lista: Nils Saue¹; Jon Ystgaard¹; Jon Johannessen¹; *Markus Meier*²; Raymond Perruchoud²; ¹Alcoa Lista; ²R&D Carbon Ltd.

3:50 PM Break**4:10 PM**

Baked Anode Quality Improvement through Optimization of Green Anode Plant Ultra Fine Content in Ball Mill Product and Process Parameters: Rajesh Garg¹; *Daniel Sulaiman*¹; Masood Toorani¹; ¹Aluminium Bahrain

4:35 PM

Baked Anode Quality Improvement through Optimization of Green Anode Processing: Xu Haifei¹; *Fan Lijun*¹; Zhang Yang²; Sun Yi¹; Cui Yinhe¹; ¹SAMI; ²Lanzhou Branch of Chalco

Electrometallurgy 2012: Session I

Sponsored by: The Minerals, Metals and Materials Society, The Metallurgy and Materials Society of CIM, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee

Program Organizers: Georges Houlachi, Hydro-Quebec; Antoine Allanore, Massachusetts Institute of Technology; Michael Free, University of Utah; Michael Moats, University of Utah; Edouard Asselin, UBC; Shijie Wang, Rio Tinto Kennecott Utah Copper; James Yurko, Materion Brush Beryllium and Composites

Monday PM
March 12, 2012

Room: Europe 5
Location: Dolphin Resort

Session Chairs: Michael Free, University of Utah; Georges Houlachi, Hydro-Quebec

2:00 PM Introductory Comments**2:05 PM**

Electrometallurgy – Now and in the Future: *Michael Free*¹; Michael Moats¹; Tim Robinson²; Georges Houlachi³; Neale Neelameggham⁴; David Creber⁵; George Holywell⁶; Marco Ginatta⁷; ¹University of Utah; ²Republic Anode Fabricators; ³Hydro-Quebec; ⁴ind.LLC; ⁵Rio Tinto Alcan; ⁶Almagi, Inc.; ⁷Ginatta Technologie

2:25 PM

Performance and Commercialization of the Smart Anode, MSA™, for Environmentally Friendly Electrometallurgical Process: *Masatsugu Morimitsu*¹; ¹Doshisha University

2:45 PM

A Novel Oxygen Evolution Anode for Electrowinning of Non-ferrous Metals: *Tian Zhang*¹; Masatsugu Morimitsu¹; ¹Doshisha University

3:05 PM

Novel DSA® Anode for Electrowinning of Non Ferrous Metals: *Antonio Antozzi*¹; ¹Industrie De Nora SpA

3:25 PM

Increasing Oxygen Charge Transfer Resistance on the Anode in Copper Electrowinning: *Reuben Mathew*¹; ¹Laurentian University

3:45 PM Break**4:00 PM**

Development of a Fully Dynamic Simulation of the Zinc Electrowinning Process: *Michael Mahon*¹; Spencer Peng¹; Larry Wasik²; Akram Alfantazi¹; ¹University of British Columbia; ²Aurel Systems

4:20 PM

Aqueous Electrodeposition of Molybdenum: Thomas Morley¹; Leah Penner²; Francois Benard³; Tom Ruth¹; Paul Schaffer¹; Stefan Zeisler¹; *Edouard Asselin*²; ¹TRIUMF; ²UBC; ³BC Cancer Agency Research Centre



TMS 2012

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MONDAY PM

4:40 PM

Lead Anodes Performance in Nickel Electrowinning: *Farzad Mohammadi*¹; Mathew Tunnicliffe¹; Paul Nesbit¹; Akram Alfantazi¹; ¹University of British Columbia

5:00 PM

Effect of Different Electrolyte Additives in Zinc Electrowinning Process Using Taguchi Statistical Design Methodology: *Somayeh Dasthi*¹; Fereshteh Rashchi¹; Ehsan Vahidi¹; ¹University of Tehran

Emeritus Professor George D.W. Smith Honorary Symposium: Novel Materials and Aluminium Alloys

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Michael Miller, Oak Ridge National Laboratory; Gregory Olson, Northwestern University and QuesTek Innovations LLC; George Krauss, Colorado School of Mines

Monday PM

March 12, 2012

Room: Mockingbird 2

Location: Swan Resort

Funding support provided by: Oak Ridge National Laboratory; QuesTek Innovations LLC; AMETEK, Inc

Session Chairs: David Larson, Cameca Instruments, Inc.; Alfred Cerezo, Oxford University

2:00 PM Invited

Atom Probe Tomography of Inorganic Materials and Their Devices Using Ultraviolet Laser Atom Probe: *Kazuhiro Hono*¹; Tadakatsu Ohkubo¹; ¹National Institute for Materials Science

2:25 PM Invited

Microstructure of Cemented Carbides: *Hans-Olof Andr en*¹; ¹Chalmers University of Technology

2:50 PM

Possibility of Electron Beam Damage on the InGaN well Layers of LED Evaluated by Atom Probe Tomography: *Woo Young Jung*¹; Gil Ho Gu¹; Chan Gyung Park¹; ¹Pohang University of Science and Technology (POSTECH)

3:05 PM

From Two to Three Dimensions: the Mutual Benefits of Cross-sectional Scanning Tunnelling Microscopy and Atom Probe Tomography: *Devin Giddings*¹; Joris Keizer¹; Rian Hamhuis¹; Paul Koenraad¹; ¹Eindhoven University of Technology

3:20 PM

Preliminary Investigation of the Microstructure-Property-Processing Relationships in a Series of Co-Cr-Cu-Fe-Ni-Al High Entropy Alloys: *Abraham Munitz*¹; David Diercks¹; Michael Kaufman¹; ¹Colorado School of Mines

3:35 PM Break

4:00 PM Invited

Atom Probe Tomography Analysis of Solute Clustering in Al-Mg-Si Alloys: *Gang Sha*¹; Gun Bulent¹; Simon Ringer¹; ¹The University of Sydney

4:25 PM Invited

Origins of Nanocluster Formation with Microalloying Elements Responsible for the Accelerated Precipitation of the Strengthening Phases in Age-Hardenable Aluminum Alloys: *Shoichi Hirotsawa*¹; Tomo Ogura²; Ai Serizawa²; Yoshiki Komiya³; Tatsuo Sato⁴; ¹Yokohama National University; ²Osaka University; ³Meisei University; ⁴Tokyo Institute of Technology

4:50 PM

Chemical-Texture and Nanotopology in Hierarchy-Strengthened Al Alloys: *Peter Liddicoat*¹; Maxim Murashkin²; Xiaozhou Liao¹; Ruslan Valiev²; Simon Ringer¹; ¹The University of Sydney; ²Ufa State Aviation Technical University

5:05 PM Invited

Catalytic Reactions Investigated by Field Ion Microscopy and Atom-Probe Techniques: *Norbert Kruse*¹; ¹University Libre de Bruxelles

5:30 PM

Development and Recent Applications of FIM/APT for Heterogeneous Catalysis: *Paul Bagot*¹; Tong Li¹; Emmanuelle Marquis²; Edman Tsang¹; George Smith¹; ¹University of Oxford; ²University of Michigan

5:45 PM

Buried Interface Analysis Using Atom Probe Tomography: *Suntharampillai Thevuthasan*¹; Satyanarayana V. N. T. Kuchibhatla¹; Arun Devaraj¹; Fang Liu²; Shutthanandan Vaithiyalingam¹; Manjula Nandasiri¹; Bruce Arey¹; Chongmin Wang¹; Lisa Porter²; Robert Davis²; Ty Prosa³; ¹EMSL, Pacific Northwest National Lab; ²Carnegie Mellon University; ³Cameca Instruments Inc

Energy Nanomaterials: Li-ion Batteries and Beyond

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Reza Shahbazian-Yassar, Michigan Technological University; Ming Au, Savannah River National Laboratory; Meyya Meyyappan, NASA Ames Research Center

Monday PM

March 12, 2012

Room: Swan 3

Location: Swan Resort

Session Chairs: Reza Shahbazian Yassar, Michigan Technological University; Ilias Belharouak, Argonne National Laboratory

2:00 PM

Self-Aligned Cu-Si Core-Shell Nanowire Array as a High-Performance Anode for Li-Ion Batteries: *Jun Qu*¹; Huaqing Li²; John Henry¹; Surendra Martha¹; Miaofang Chi¹; Hanbing Xu¹; Nancy Dudney¹; Michael Lance¹; Shannon Mahurin¹; Theodore Besmann¹; Sheng Dai¹; ¹Oak Ridge National Laboratory; ²University of Tennessee

2:20 PM

Investigation of Synthesis of Nano-LiNi_{0.5}Mn_{1.5}O₄ Cathode Material for Lithium-Ion Battery by In-Situ Neutron Diffraction: *Lu Cai*¹; Zengcai Liu²; Chengdu Liang³; Ke An¹; ¹Spallation Neutron Source, Oak Ridge National Laboratory; ²Center for Nanophase Material Sciences; ³Center for Nanophase Material Sciences

2:40 PM

Transmission Electron Microscopy Studies on Lithium Battery Materials II: Characterization of Mesoporous TiO₂ Films: *Alpesh Shukla*¹; Natacha Krins¹; Guoying Chen¹; Thomas Richardson¹; ¹Lawrence Berkeley National Laboratory

3:00 PM Invited

The Facts Influencing Rechargeability of Lithium/Air Batteries: *Ming Au*¹; Elise Fox¹; Hector Colon-Mercado¹; Thad Adams¹; ¹Savannah River National Laboratory

3:30 PM Break

3:50 PM

Solution Precursor Plasma Synthesized Flexible Manganese Oxide Anodes for Li-Ion Batteries: *Ramesh Kumar Guduru*¹; Raghavender Tummala¹; Pravansu S. Mohanty¹; ¹Univ of Michigan

4:10 PM

Transmission Electron Microscopy Studies on Lithium Battery Materials I: Conversion Reactions in Nickel Oxide Nanoplates: *Alpesh Shukla*¹; Jordi Cabana¹; Peter Ercius²; Abhay Raj Singh Gautam²; Ulrich Dahmen²; ¹Lawrence Berkeley National Laboratory; ²National Center of Electron Microscopy, Lawrence Berkeley National Laboratory

4:30 PM

New Method to Fabricate Nanoporous Silicon for Lithium Ion Batteries: *Xu Jiang*¹; Thomas Balk¹; ¹University of Kentucky

4:45 PM

A Novel Type of Carbon Coated Sulfur Nanoparticles for Li/S Batteries: *Yan Yuan*¹; Elton Cairns¹; ¹LBNL

Fatigue and Corrosion Damage in Metallic Materials: Fundamentals, Modeling and Prevention: Fatigue Property-microstructure Relationships and Crack Growth

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum; Peter Liaw, University of Tennessee

Monday PM
March 12, 2012

Room: Oceanic 6
Location: Dolphin Resort

Session Chairs: Youshi Hong, Institute of Mechanics, Chinese Academy of Sciences; Antonios Kotsos, Drexel University

2:00 PM Invited

Identification of Fatigue Crack Initiation from Surface Particles in High Strength Al Alloys: *Xinliang Zang*¹; Wei Wen²; Zhiqiang Xu¹; Alfonso Ngan³; Tongguang Zhai²; ¹Yanshan University; ²University of Kentucky; ³University of Hong Kong

2:20 PM

Influence of the Inclusion Shape on the Rolling Contact Fatigue Life of Carburized Steels: *Yutaka Neishi*¹; Taizo Makino¹; Naoki Matsui¹; Hitoshi Matsumoto²; Masashi Higashida²; Hideki Ambai²; ¹Sumitomo Metal Industries, Ltd.; ²Sumitomo Metals(Kokura), Ltd.

2:40 PM

Effects of Size And Position of Al₂O₃ Inclusions On fatigue Crack Initiation in Low Carbon Bainitic Steel: *Tongguang Zhai*¹; Xiucheng Li²; Wei Wen¹; Chengjia Shang³; Linghui Du⁴; ¹University of Kentucky; ²University of Science and Technology Beijing ; ³University of Science and Technology Beijing; ⁴CNMC Ningxia Orient Group Co. Ltd

3:00 PM

Scale-Bridging Fatigue Monitoring in Magnesium Alloys: *Antonios Kotsos*¹; Kavan Hazel¹; Prashanth Abraham¹; Jefferson Cuadra¹; Eric Schwartz¹; Raghavendra Saralaya¹; Tim Schmidt²; ¹Drexel University; ²Trillion Quality Systems

3:20 PM

Effect of Orientation on Fretting Behavior of a Single-Crystal Ni-Base Superalloy: *Nabil Marouf*¹; Siegfried Fouvry¹; Philippe Belaygue²; ¹LTDS; ²TURBOMECA

3:40 PM Break

3:50 PM

Slip Transfer across Grain Boundaries and Its influence on the Development of Local Strain Heterogeneities in the Plastic Response: *Wael Abuzaïd*¹; Michael Sangid²; Jay Carroll³; Huseyin Sehitoglu¹; John Lambros¹; Ravinder Chona⁴; ¹University of Illinois at Urbana-Champaign; ²Purdue University; ³Sandia National Laboratories; ⁴Air Force Research Lab

4:10 PM

Influence of Aluminide Coatings on Fatigue Behavior during Sustained-Peak Low-Cycle Fatigue in a Single-Crystal Ni-Base Superalloy: *Luke Rettberg*¹; Tresa Pollock¹; ¹University of California Santa Barbara

4:30 PM

Evolution of Microstructure and Mechanical Properties during Rolling Contact Fatigue in High Strength Case-Hardened and Through-Hardened Steels: *Ghatu Subhash*¹; Nagaraj Arakere¹; Bryan Allyson¹; ¹University of Florida

4:50 PM

In Situ Neutron Diffraction Measurements of Stress Fields Around a Fatigue-Crack Tip Under Loading: Soo Yeol Lee¹; E-Wen Huang²; Kuan-Wei Lee²; Wanchuck Woo³; ¹Department of Materials Science and Engineering, Chungnam National University, Daejeon, 305-764, South Korea; ²Department of Chemical & Materials Engineering and Center for Neutron Beam Applications; ³Neutron Science Division, Korea Atomic Energy Research Institute

5:10 PM

Influence of Twin-Boundary on the Bauschinger's Effect in Cu Crystal- a Molecular Dynamics Simulation Study: *Di Zhu*¹; Hao Zhang¹; Dongyang Li¹; ¹University of Alberta

From Macro to Nano, Understanding Mechanical Behavior across Length Scales: A Structural Materials Division Symposium in Honor of Robert Ritchie: Fatigue

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Biomaterials Committee
Program Organizers: Jamie Kruzic, Oregon State University; Brad Boyce, Sandia National Labs; Reinhold Dauskardt, Stanford University

Monday PM
March 12, 2012

Room: Mockingbird 1
Location: Swan Resort

Session Chairs: Jamie Kruzic, Oregon State University; Nikhilesh Chawla, Arizona State University

2:00 PM Introductory Comments

2:05 PM

Predicting the Behavior of Short Fatigue Cracks: *Jamie Kruzic*¹; Sarah Gallops¹; Rawley Greene¹; ¹Oregon State University



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2:20 PM

The Continuing Relevance of Small Fatigue Crack Growth Behavior in the Design and Life Management of Structural Aerospace Components: *Michael Caton*¹; Sushant Jha²; M. Burba³; James Larsen¹; Reji John¹; Andrew Rosenberger¹; ¹US Air Force Research Laboratory; ²Universal Technology Corporation; ³University of Dayton

2:35 PM

Relating Fatigue Crack Initiation and Small Crack Propagation to Microstructure in the Polycrystalline Nickel Base Superalloy, Rene 88DT: Jiashi Miao¹; Tresa Pollock²; *J. Wayne Jones*¹; ¹University of Michigan; ²University of California Santa Barbara

2:50 PM

Endurance Limits and Non-Propagating Cracks: *Herwig Mayer*¹; Bernd Schönbauer¹; Stefanie Stanzl-Tscheegg¹; ¹BOKU University Vienna

3:05 PM

Deformation Mechanisms of Small Crack Growth under Dwell-Fatigue in a Ni-Base Superalloy: *G. B. Viswanathan*¹; Sushant Jha¹; Sam Kuhr²; Jay Tiley¹; Hamish Fraser²; Reji John¹; C. Woodward¹; ¹Air Force Research Laboratory; ²The Ohio State University

3:20 PM

Effects of Local Crystallography and Inclusion Geometry on Nucleation and Propagation of Short Fatigue Cracks in Al 2024-T351: Statistics and Mechanisms: Admir Makas¹; Jaclyn Avallone¹; Ross MacKinnon¹; Ikshwaku Atodaria¹; Dallas Kingsbury¹; *Pedro Peralta*¹; Aditi Chattopadhyay¹; ¹Arizona State University

3:35 PM Break

3:50 PM

Understanding Fatigue Crack Growth by In Situ 3D X-ray Synchrotron Tomography: *Nikhilesh Chawla*¹; ¹Arizona State University

4:05 PM

Leave-in-Place Laser Scanning for Fatigue Damage Monitoring and Prognosis: *James Earthman*¹; Benjamin Buckner²; Kwai Chan³; Xiaoxi Liu¹; Vladimir Markov²; ¹University of California, Irvine; ²Metrolaser, Inc.; ³Souwest Research Institute

4:20 PM

The Effect of Microstructure on Strain Field Inhomogeneities in Fatigue Crack Growth: *Jay Carroll*¹; Wael Abuzaid²; Mallory Casperson²; John Lambros²; Huseyin Sehitoglu²; Ravinder Chona²; Brad Boyce¹; ¹Sandia National Laboratories; ²University of Illinois at Urbana-Champaign

4:35 PM

Reducing Uncertainty for Fatigue Life Limits at Notches in Two Structural Alloys: *Dennis Buchanan*¹; James Larsen²; Andrew Rosenberger²; Reji John²; Sushant Jha³; Alisha Hutson¹; W. John Porter¹; ¹UDRI; ²Air Force Research Laboratory; ³Universal Technology Corporation

4:50 PM

A Comparison of Cast Aluminum Bulkhead Fatigue Resistance: The Effect of Specimen Geometry: *Aindrea Campbell*¹; John Allison²; ¹Ford Motor Company; ²University of Michigan

5:05 PM

Predicting Fatigue Crack Growth Behavior at Different Crack Size Scales: *Anastasios Gavras*¹; Diana Lados¹; ¹Worcester Polytechnic Institute

Integrative Materials Design: Performance and Sustainability: Processing and Properties of Traditional and Novel Materials at Ambient and High Temperatures II and Condition Assessment and Monitoring

Sponsored by: The Minerals, Metals and Materials Society, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizer: Diana A. Lados, Worcester Polytechnic Institute

Monday PM
March 12, 2012

Room: Europe 2
Location: Dolphin Resort

Session Chair: Diana Lados, Worcester Polytechnic Institute

2:00 PM Invited

AA362.0 Aluminum Alloy: Utilizing Improved Fatigue Properties of Sustainable Alloys in Design: *Kevin Anderson*¹; Michael P. Mihelich²; William J. Towne²; Gregg D. Langenfeld²; Raymond J. Donahue²; ¹Mercury Fellow, Mercury Marine, Product Development & Engineering; ²Mercury Marine, Product Development & Engineering

2:25 PM Invited

Reduce Your Burden – Use Magnesium Alloys: *Norbert Hort*¹; ¹Helmholtz-Zentrum Geesthacht

2:50 PM Invited

Fatigue Crack Growth in Metallic Materials: Mechanisms and Design Methods: *Anastasios Gavras*¹; Diana Lados¹; ¹Worcester Polytechnic Institute

3:15 PM Invited

Production-to-Retirement Condition Assessment and Monitoring for Aircraft CBM+: David Grundy¹; David Jablonski¹; Yanko Sheiretov¹; *Vladimir Zilberstein*¹; Neil Goldfine¹; ¹JENTEK Sensors, Inc.

3:40 PM Break

4:05 PM Invited

Materials for Aircraft Turbine Engines: *Vasisht Venkatesh*¹; David Furrer¹; ¹Pratt & Whitney

4:25 PM Invited

Effects of Hot Compressive Dwell Condition on the Fatigue Crack Growth Response of Cast Aluminum Alloys: *Xiang Chen*¹; Diana Lados¹; Richard Pettit²; ¹Worcester Polytechnic Institute; ²FractureLab, LLC

4:45 PM Invited

Modeling and Prediction of Elevated Temperature Crack Growth Rates: *Ryan Brodie*¹; ¹Pratt & Whitney Rocketdyne

5:10 PM

Towards an Understanding of the Oxidation Performance of Polycrystalline Nickel Superalloys: *David Crudden*¹; Babak Raeisina¹; Roger Reed¹; Mark Hardy¹; ¹University of Birmingham

5:30 PM Invited

Advancements in Nuclear Materials Research at the Idaho National Laboratory: *John Jackson*¹; Sebastien Teysseyre¹; Richard Wright¹; James Cole¹; Douglas Porter¹; ¹Idaho National Laboratory

International Smelting Technology Symposium (Incorporating the 6th Advances in Sulfide Smelting Symposium): Smelter Design, Construction, Commissioning and Operation

Sponsored by: The Minerals, Metals and Materials Society, The Metallurgy and Materials Society of CIM, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
Program Organizers: Jerome Downey, Montana Tech of the Univ of Montana; Thomas Battle, Midrex Technologies, Inc.; Jesse White, Elkem Solar Research

Monday PM
March 12, 2012

Room: Northern A3
Location: Dolphin Resort

Session Chair: To Be Announced

2:00 PM

Boliden Rönnskär Smelter: Challenges and Opportunities for Modern Smelting

: Theo Lehner¹; Jan Stål¹; ¹Boliden Mineral AB

2:25 PM

Design and Commissioning of the Ausmelt TSL Lead Smelter at Yunnan Tin Company Limited: Helin Gu¹; Xingcheng Song¹; Xu Lan¹; Ross Baldock²; Ross Andrews²; Markus Reuter²; ¹Yunnan Tin Company Ltd; ²Outotec Pty Ltd

2:50 PM

Granulation as it Pertains to Electric Furnace Matte, Converter Slag, and Converter Matte in a PGM Smelter: Greg Roset¹; Dayle Flynn¹; Jake Bummer¹; ¹Stillwater Mining Company

3:15 PM

Design, Development and Early operations of the Konkola Copper Mines Nchanga Smelter Direct Blister Flash Process, Chingola, Zambia: Enoch Mponda¹; Timothy Smith²; ¹KCM plc; ²SNC Lavalin

3:40 PM Break

3:55 PM

Waste Heat Recovery from Industrial Smelting Exhaust Gas: Geir Wedde¹; Anders Sorhuus¹; ¹Alstom

4:20 PM

High Performance Brands for the Nonferrous Metals Industry: Dean Gregurek¹; Alfred Spanring¹; Angelika Ressler¹; Sonja Breyner¹; ¹RHI AG

4:45 PM

Sidewall Design to Improve Lining Life in a Platinum Smelting Furnace: Isobel Mc Dougall¹; Jacques Eksteen²; ¹Tenova Pyromet; ²Lonmin South Africa

5:10 PM

SiC Formation in Submerged Arc Furnaces Producing Silicomanganese: Per Anders Eidem¹; Jens Davidsen¹; Merete Tangstad²; ¹Eramet Norway AS; ²Norwegian University of Science and Technology

IOMMMS Global Materials Forum: Materials in a Green Economy: An International Perspective: Session I

Sponsored by: The Minerals, Metals and Materials Society, TMS: Materials and Society Committee, TMS: Public and Governmental Affairs Committee

Program Organizers: Sanak Mishra, Arcelor Mittal India; Jud Ready, Georgia Institute of Technology; Christina Meskers, Umicore

Monday PM
March 12, 2012

Room: Northern A4
Location: Dolphin Resort

Session Chairs: Sanak Mishra, ArcelorMittal India Limited; Diran Apelian, Worcester Polytechnic Institute

2:00 PM Introductory Comments by Dr. Sanak Mishra

2:10 PM Invited

The Role of Materials Recycling in Economic Sustainability: Brajendra Mishra¹; Warren Hunt²; ¹Colorado School of Mines; ²Executive Director, The Minerals, Metals & Materials Society

2:30 PM Invited

Innovative Developments in Steel Industry to Address Global Environmental Trends: Debashish Bhattacharjee¹; ¹Tata Steel Research Development & Technology

2:50 PM Invited

Recent Development of Materials for Green Energy in Korea: Soon Young Hwang¹; Jin-Hong Kim¹; ¹RIST

3:10 PM Invited

Developing High Performance Steels in a Green Economy: Chengjia Shang¹; Yuqing Weng²; ¹University of Science and Technology Beijing; ²The Chinese Society for Metals

3:30 PM Invited

An Alternative Approach to Sustainable, Low-Carbon Energy: Inertial Fusion Energy and its Materials Challenges: Tomás Díaz de la Rubia¹; ¹Lawrence Livermore National Laboratory

3:50 PM Break

4:05 PM Invited

Metals, Materials and the Environment: Bhaskar Roy¹; ¹M.N. Dastur & Company(P) Ltd

4:25 PM Invited

A Strategy of Metal Supply for Sustainable Development and Supporting Technologies for It in Japan: Takashi Nakamura¹; A. Inaba²; ¹Institute of Multidisciplinary Research for Advanced Materials; ²Major of Applied Chemistry and Chemical Engineering

4:45 PM Invited

Multi-Eye Approach for Clarification of Surface/Interface Phenomena in Environment and Energy Materials: Kotobu Nagai¹; ¹National Institute for Materials Science

5:05 PM Invited

Aluminium Production, Manufacturing and Recycling in Australia – Materials Innovation for a Clean Energy Future: Malcolm Couper¹; ¹Monash University

MONDAY PM



TMS 2012

141st Annual Meeting & Exhibition

MONDAY PM

5:25 PM Invited

Natural Fiber Composites – Significant Contribution to a Green Economy: *Sergio Monteiro*¹; Marc-Andre Meyers²; João Carlos Miguez Suarez²; ¹State University of the Northern Rio de Janeiro - UENF; ²Military Institute of Engineering; Brazilian Association for Metallurgy, Materials and Mining

5:45 PM Concluding Comments by Prof. Diran Apelian

Magnesium Technology 2012: Deformation Mechanisms

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht; Neale Neelameggham, U.S. Magnesium

Monday PM

March 12, 2012

Room: Southern IV

Location: Dolphin Resort

Session Chairs: Bin Li, Mississippi State University; Alok Singh, National Institute of Materials Science

2:00 PM

An Elasto-Plastic Micromechanical Method for Twin Driven Plasticity: *Laurent Capolungo*¹; Pierre Alexandre Juan¹; Stephane Berbenni²; Carlos Tome³; ¹Georgia Institute of Technology; ²Universite Paul Verlaine; ³Los Alamos National Laboratory

2:20 PM

Anomalous Twin Bands in AZ31 Mg Sheet Bending: James Crawford Baird¹; *Bin Li*¹; Sanaz Yazdan Parast¹; Stephen Horstemeyer¹; Haitham El Kadiri¹; Paul Wang¹; ¹Center for Advanced Vehicular Systems

2:40 PM

Formation of Nano-Scale Twins and Low Angle Grain Boundaries during Fracture of Fine Grained Magnesium Alloys: *Alok Singh*¹; Hidetoshi Somekawa¹; Toshiji Mukai²; ¹National Institute for Materials Science; ²Kobe University

3:00 PM

Tensile and Creep Deformation Mechanisms in Rolled AZ31: Carl Boehlert¹; Zhe Chen¹; Ivan Gutiérrez-Urrutia²; Jan Bohlen³; Sangbong Yi³; Dietmar Letzig³; Javier Llorca⁴; *Maria Teresa Perez-Prado*⁴; ¹Michigan State University; ²Max Planck Institute for Iron Research; ³Magnesium Innovation Centre MagIC; ⁴IMDEA-Materials

3:20 PM

Structural Origin of Reversible Twinning, Non-Schmid Effect, Incoherent Twin Boundaries and Texture of Hexagonal Close-Packed Metals: *Bin Li*¹; Xiyang Zhang²; Haitham El Kadiri¹; Suveen Mathaudhu³; Quancang Ma¹; ¹Center for Advanced Vehicular Systems; ²Chongqing University; ³Army Research Laboratory

3:40 PM Break

4:00 PM

Length Changes in Extruded Magnesium Alloy Bars Under Large Strain Free-End Torsion: Huamiao Wang¹; *Peidong Wu*¹; Ken Neale²; ¹McMaster University; ²University of Sherbrooke

4:40 PM

Non-Basal Textures in Magnesium Alloy Strips by Extrusion-Machining: *Dinakar Sagapuram*¹; Mert Efe¹; Wilfredo Moscoso²; Srinivasan Chandrasekar¹; Kevin Trumble¹; ¹Purdue University; ²Pontificia Universidad Catolica Madre y Maestra

4:20 PM

Nano-Indentation Studies of Twinned Magnesium Single Crystals: Fumiaki Hiura¹; Raja Mishra²; Michael Lukitsch²; *Marek Niewczas*¹; ¹McMaster University; ²General Motors Research & Development Center

5:00 PM

The Elastic-Plastic Transition in AZ31 Magnesium Alloy: *Kun Yang*¹; Carlos Caceres¹; ¹The University of Queensland

Magnesium Technology 2012: Primary Production

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht; Neale Neelameggham, U.S. Magnesium

Monday PM

March 12, 2012

Room: Southern V

Location: Dolphin Resort

Session Chairs: Neale Neelameggham, IND, Inc; Adam Powell, Metal Oxygen Separation Technologies, Inc.

2:00 PM

Carbothermal Production of Magnesium: CSIRO's MagSonic™
Process: *Leon Prentice*¹; Michael Nagle¹; Timothy Barton¹; Steven Tassios¹; Benny Kuan²; Peter Witt²; Keri Constanti-Carey¹; ¹CSIRO Process Science and Engineering; ²CSIRO Mathematics Informatics and Statistics

2:20 PM

MagSonic™ Carbothermal Technology Compared with the Electrolytic and Pidgeon Processes: *Leon Prentice*¹; Nawshad Haque¹; ¹CSIRO Process Science and Engineering

2:40 PM

Scaling-Up Solid Oxide Membrane Electrolysis Technology for Magnesium Production: *Soobhankar Pati*¹; Adam Powell¹; Steve Tucker¹; Steve Derezinski¹; MOxST Inc.

3:00 PM

Fluid Bed Dehydration of Magnesium Chloride: *Kamal Adham*¹; ¹Hatch Ltd.

3:20 PM

Demonstration of Solar-Pumped Laser-Induced Magnesium Production from Magnesium Oxide: Yabe Takashi¹; Ohkubo Tomomasa¹; *Dinh Thanh Hung*¹; Kuboyama Hiroki¹; Nakano Junichi¹; ¹Tokyo Institute of Technology

3:40 PM Break

4:00 PM

Molten Salt Electrolysis of MgCl₂ in a Cell with Rapid Chlorine Removal Feature: *Gökhan Demireci*¹; Ishak Karakaya²; ¹Aselsan Inc.; ²Middle East Technical University

4:20 PM

Preparation of Aluminum-Magnesium Alloy from Magnesium Oxide in RECl₃-LiF-MgF₂ Electrolyte by Molten Salts Electrolysis Method: *Sh Yang*¹; Fengli Yang¹; Xianwei Hu²; Zhaowen Wang²; Zhongning Shi²; Bingliang Gao²; ¹Jiangxi University of Science and Technology; ²Northeastern University

4:40 PM

Experimental Study on Magnesium Extracted from Ascharite Mineral by Aluminium: *Peng Jianping*¹; Wu Xiaolei¹; Feng Naixiang¹; Zhou Shigang¹; Di Yuezhong¹; ¹Northeastern University

5:00 PM

Electrochemical Investigation on Chlorine and Electrolyte Intercalation into Graphite Anodes during Magnesium Electrolysis Process: *Bing Li¹*; Jingwei Lou¹; Mengfan Yan¹; ¹East China University of Science and Technology

5:20 PM

Optimization of Preparation for MgO by Calcination from Basic Magnesium Carbonate Using Response Surface Methodology: *Bin Zhang¹*; Jinhui Peng¹; Libo Zhang¹; shaohua Ju¹; ¹Kunming University of Science and Technology

Materials and Fuels for the Current and Advanced Nuclear Reactors: Nuclear Fuels - Characterization

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS/ASM: Nuclear Materials Committee

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Monday PM
March 12, 2012

Room: Swan 2
Location: Swan Resort

Session Chairs: Robert Mariani, Idaho National Laboratory; Ramprashad Prabhakaran, Idaho National Laboratory

2:00 PM

Recent Developments in the Study of the Effects of Irradiation on the Microstructure of U-Mo Nuclear Fuels: *Dennis Keiser¹*; Jan-Fong Jue¹; Jian Gan¹; Adam Robinson¹; Pavel Medvedev¹; ¹Idaho National Laboratory

2:20 PM

TEM Study on the Phase Development and Microstructure in a U-7 wt.% Mo vs. Al-7 wt.% Ge Diffusion Couple: *E. Perez¹*; D.D. Keiser¹; Y.H. Sohn²; ¹Idaho National Laboratory; ²University of Central Florida

2:40 PM

Observations and Analyses of Diffusion Couples, U-10 wt.% Mo vs. Zr: *Ke Huang¹*; Youngjoo Park¹; Dennis Keiser²; Yongho Sohn¹; ¹University of Central Florida; ²Idaho National Laboratory

3:00 PM

Mechanical Properties of U-Mo Fuels: *Ramprashad Prabhakaran¹*; Douglas Burkes²; Jan-Fong Jue¹; Amy DeMint³; Jack Gooch³; Dennis Keiser¹; Daniel Wachs¹; ¹Idaho National Laboratory; ²Pacific Northwest National Laboratory; ³Y-12 National Security Complex

3:20 PM

Metallurgical Characterization of the Delta Phase Formation in Uranium-Zirconium Alloy Fuels: *Sandeep Irukuvarghula¹*; Sean McDeavitt¹; Sangjoon Ahn¹; ¹Texas A&M University

3:40 PM Break

3:50 PM

Thermodynamic Assessment of the Uranium-Zirconium Alloy System for Nuclear Energy Applications: *Sangjoon Ahn¹*; Sandeep Irukuvarghula¹; Sean McDeavitt¹; ¹Texas A&M University

4:10 PM

Characterization of U-Zr-Ce and U-Mo-Ce Alloy Fuels Doped with In, Sb, and Pd: *Yeon Soo Kim¹*; Gerard Hofman¹; Tom Wiencek¹; Ed O'Hare¹; Jeff Fortner¹; ¹Argonne National Laboratory

4:30 PM

Interdiffusion between U - 10wt.% Zr and Fe Diffusion Couples Annealed at 903, 923, 953 and 973K: *Youngjoo Park¹*; Ke Huang¹; Bulent Sencer²; Rory Kennedy²; Yongho Sohn¹; ¹University of Central Florida; ²Idaho National Laboratory

4:50 PM

Microanalysis of Irradiated Coated Particle Fuel from the AGR-1 Irradiation Experiment: *Paul Demkowicz¹*; Isabella van Rooyen¹; Scott Ploger¹; Jessica Riesterer¹; Brandon Miller¹; ¹Idaho National Laboratory

5:10 PM

Postirradiation Examination of High Burnup Metallic Fuels: *Heather Chichester¹*; Douglas Porter¹; Steven Hayes¹; ¹Idaho National Laboratory

Materials Design Approaches and Experiences III: Material Design Tools

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Ji-Cheng Zhao, The Ohio State University; Akane Suzuki, GE Global Research; Deb Whitis, GE Aviation; Michael Fahrman, Haynes International Inc.; Qiang Feng, University of Science and Technology Beijing

Monday PM
March 12, 2012

Room: Europe 11
Location: Dolphin Resort

Session Chairs: Deb Whitis, GE Aviation; Hamish Fraser, The Ohio State University

2:00 PM Invited

Multiscale Modeling of Mechanical Performance from a Perspective of Materials Design: *Dennis Dimiduk¹*; ¹Air Force Research Laboratory

2:30 PM Invited

MaterialsGenome®: Building Blocks of Materials: *Zi-Kui Liu¹*; ¹The Pennsylvania State University

3:00 PM Invited

Experimental Tools for the Materials Genome Initiative: *Ji-Cheng Zhao¹*; ¹The Ohio State University

3:30 PM Break

3:50 PM Invited

An Integrated CALPHAD Tool for Modeling Precipitation Kinetics and Accelerating Materials Design: *Qing Chen¹*; Herng-Jeng Jou²; Gustaf Sterner¹; Johan Bratberg¹; Anders Engström¹; Paul Mason³; ¹Thermo-Calc Software AB; ²QuesTek Innovations LLC; ³Thermo-Calc Software, Inc

4:20 PM Invited

Integrated Computational Materials Engineering for Precipitation Modeling of Multi-Component Alloys: *Fan Zhang¹*; W. S. Cao¹; S. L. Chen¹; Chuan Zhang¹; Y. A. Chang¹; ¹CompuTherm, LLC

4:50 PM Invited

Direct 3-D Materials Characterization and Its Incorporation into Computational Models: John Sosa¹; Daniel Huber¹; Robert Williams¹; Peter Collins²; *Hamish Fraser¹*; ¹The Ohio State University; ²University of North Texas

5:20 PM Invited

Use of Phase Field Method as a Tool for Alloy Design: Ning Zhou¹; *Yunzhi Wang¹*; ¹Ohio State University



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Materials Processing Fundamentals: Physical Metallurgy of Steel

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Process Technology and Modeling Committee
Program Organizers: Lifeng Zhang, Missouri University of Science and Technology; Antoine Allanore, MIT; Cong Wang, Saint-Gobain High Performance Materials

Monday PM Room: Oceanic 8
 March 12, 2012 Location: Dolphin Resort

Session Chairs: Antoine Allanore, MIT; Lifeng Zhang, Missouri S&T

2:00 PM

Estimation of Yield Strength of Linepipe Steel Pipes by Stress-Strain Curves Obtained from Low-Cycle Fatigue Tests: *Seok Su Sohn*¹; Seung Youb Han¹; Sang Yong Shin¹; Jin-ho Bae²; Nack J. Kim¹; Hyoung Seop Kim¹; Sunghak Lee¹; ¹Pohang University of Science and Technology; ²POSCO Corp.

2:25 PM

Evaluation of Phase Transformations in Subcritical Temperature Austenitic Nitriding: *Yingying Wei*¹; Zbigniew Zurecki²; Richard Sisson¹; ¹Worcester Polytechnic Institute; ²Air Products and Chemicals, Inc.

2:50 PM

Influence of the Hot Rolling Process on the Mechanical Behaviour of Dual Phase Steel: *Mehdi Asadi*¹; Heinz Palkowski²; ¹Benteler Automotive; ²TU Clausthal

3:15 PM

Molybdenum Effects on the Recrystallization and Austenite Decomposition of a High-Niobium HSLA Steel: *Erik Pavlina*¹; E. Damm²; John Speer³; Chester Van Tyne³; ¹Pohang University of Science and Technology; ²The Timken Company; ³Colorado School of Mines

3:40 PM

The Steel Super Strengthening Phenomenon During Intensive Quenching: *Nikolai Kobasko*¹; Michael Aronov²; Joseph Powell²; ¹IQ Technologies, Inc.; ²IQ TEchnology, Inc.

4:05 PM Break

4:20 PM

Three-Dimensional Characterization of Laser-Welds in 304-L Stainless Steel: *Jonathan Madison*¹; Larry Aagesen²; ¹Sandia National Laboratories; ²University of Michigan

4:45 PM

Continuous Casting Simulation of 2304 Duplex Stainless Steel Via Horizontal Directional Solidification Technique: *Qing Qing Sun*¹; Hong Gang Zhong¹; Xiang Ru Chen¹; Qi Jie Zhai¹; ¹Shanghai University

5:10 PM

Influence Of Cooling Rates On Nitrogen Precipitation Behaviors And The Ferrite Fraction In Cast 2507 Super Duplex Stainless Steel: *Dong Liang*¹; Honggang Zhong¹; Zhenxing Yin¹; Qijie Zhai¹; ¹Shanghai University

5:35 PM

Microstructure and Corrosion Behaviour of TiC Reinforced Duplex Stainless Steels Matrix Composites Synthesized by Laser Melt Injection: *Babatunde Obadele*¹; Peter Olubambi¹; Oluwagbenga Johnson¹; ¹Tshwane University of Technology

Materials Research in Microgravity: Session II

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
Program Organizers: Robert Hyers, University of Massachusetts; Hani Henein, University of Alberta; Valdis Bojarevics, University of Greenwich; James Downey, NASA; Douglas Matson, Tufts University; Achim Seidel, Astrium; Daniela Voss, ESA

Monday PM Room: Asia 3
 March 12, 2012 Location: Dolphin Resort

Session Chair: To Be Announced

2:00 PM

Studies of Thermophysical Properties of Metals and Semiconductors by Containerless Processing under Microgravity: *Achim Seidel*¹; Wolfgang Soellner¹; Christian Stenzel¹; ¹Astrium

2:25 PM Invited

Advanced Measurement Devices for the Microgravity Electromagnetic Levitation Facility EML: *Juergen Brillo*¹; Holger Fritze²; Georg Lohöfer¹; Michal Schulz²; Christian Stenzel³; ¹DLR; ²TU-Clausthal; ³Astrium

3:00 PM

Electrostatic Levitation Furnace for the ISS: *Keiji Murakami*¹; Naokiyo Koshikawa¹; Kohichi Shibasaki¹; Takehiko Ishikawa¹; Junpei Okada¹; Tetsuya Takada²; Tatsuya Arai²; Naoki Fujino²; Yukiko Yamaura²; ¹JAXA; ²IHI Aerospace

3:25 PM Break

3:45 PM Invited

Thermophysical Property Measurements Under Reduced Gravity Conditions: Evolution and Status of the ThermoLab Project: *H-J Fecht*¹; R.K. Wunderlich¹; L. Battezzati²; E. Ricci³; J. Etay⁴; S. Seetharaman⁵; J. Brillo⁶; M. Watanabe⁷; K. Kelton⁸; D.M. Matson⁹; Robert Hyers¹⁰; ¹U. Ulm; ²Universita di Torino; ³CNR-IENI; ⁴CNRS, SIMAP-EPM, PHELMA-Campus; ⁵KTH Royal Institute of Technology; ⁶Deutsches Zentrum für Luft- und Raumfahrt; ⁷Gakushin University; ⁸Washington University; ⁹Tufts University; ¹⁰University of Massachusetts

4:20 PM Invited

Electrostatic Levitation: A Tool to Support Materials Research in Microgravity: *Jan Rogers*¹; Michael SanSoucie¹; ¹NASA/MSFC

4:55 PM Invited

Novel Needle-Network Multi-Scale Model for the Solidification of Highly Branched Dendritic Microstructures: Damien Tourret¹; *Alain Karma*¹; ¹Northeastern University

5:30 PM

Status of Viscosity Measurements by the Oscillating Drop Method in an Electromagnetic Levitation Device under Reduced Gravity Conditions: *Jacqueline Etay*¹; Ivan Egrý²; Koulis Pericleous³; *Rainer Wunderlich*⁴; ¹CNRS SIMAP-EPM; ²DLR; ³University of Greenwich; ⁴Universitaet Ulm

Mechanical Behavior at Nanoscale I: Atomistic Modeling on Deformation Mechanisms

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Scott Mao, University of Pittsburgh; Julia R Greer, California Institute of Technology; Jianyu Huang, Center for Integrated Nanotechnologies; Marc Legros, CEMES-CNRS; Ting Zhu, Georgia Institute of Technology

Monday PM
March 12, 2012

Room: Asia 1
Location: Dolphin Resort

Session Chairs: Ting Zhu, Georgia Institute of Technology; Christopher Weinberger, Sandia National Laboratory

2:00 PM Invited

Modeling Dislocation Nucleation and Strength in Nanowires and Nanopillars: Andrew Jennings¹; Christopher Weinberger²; Julia Greer¹; ¹California Institute of Technology; ²Sandia National Labs

2:30 PM Invited

Interface-Facilitated Twinning/De-Twinning: Jian Wang¹; Nan Li¹; Irene Beyerlein¹; Nathan Mara¹; Amit Misra¹; ¹Los Alamos National Laboratory

3:00 PM

Revealing the Failure Mechanisms in Nanomaterial Electrodes for Lithium Ion Batteries: Ting Zhu¹; Shan Huang¹; Xiaohua Liu²; Jianyu Huang²; ¹Georgia Institute of Technology; ²Sandia National Laboratories

3:20 PM

Effects of Size and Microstructure in Compression of Nanoscale Metallic Pillars by Molecular Dynamics Simulation: Frederic Sansoz¹; ¹University of Vermont

3:40 PM

Emission of Dislocations from Random Grain Boundaries in Nanocrystalline FCC Materials: Laura Patrick¹; Diana Farkas¹; ¹Virginia Tech

4:00 PM Break

4:10 PM Invited

Size-Affected Behavior in Pure Compression of Micron-Sized Metallic Crystals – a Theoretical Study: Satish Rao¹; Dennis Dimiduk²; Michael Uchic²; Triplicane Parthasarathy¹; Jaafar El-Awady³; Christopher Woodward²; ¹UES Inc.; ²Air Force Research Laboratory; ³Johns Hopkins University

4:40 PM

Nanoscale Investigation of Twinning and Detwinning during Strain-Path Changes in Magnesium: Mehul Bhatia¹; Kiran Solanki²; Amitava Moitra³; ¹CAVS - Center for Advanced Vehicular System; ²Arizona State University; ³Pennsylvania State University

5:00 PM

Molecular Dynamics Study of Deformation Mechanism Map of Nanostructured Metal: Shigenobu Ogata¹; Yunjiang Wang¹; Guo-Jie Gao¹; ¹Osaka University

5:20 PM

Defect-Free Core/Shell Nanowires Based on New Misfit Strain Relaxation Mechanisms: Haijian Chu¹; Jian Wang²; Caizhi Zhou²; Irene Beyerlein²; ¹Yangzhou University; ²Los Alamos National Laboratory

5:40 PM

Core Properties of Mixed Dislocations in BCC Iron: Emmanuel Clouet¹; Mathilde Miguras¹; Mathieu Albagnac¹; ¹SRMP, CEA Saclay

Mechanical Behavior Related to Interface Physics: Interface Evolution under Mechanical Loading: Experiment, Characterization, and Theoretical Modeling

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Izabela Szlufarska, University of Wisconsin-Madison; Zhiwei Shan, Xi'an Jiaotong University

Monday PM
March 12, 2012

Room: Oceanic 1
Location: Dolphin Resort

Session Chairs: Irene Beyerlein, Los Alamos National Laboratory; Huiling Duan, Peking University

2:00 PM Keynote

FCC/BCC Interface Evolution in Severe Plastic Deformation: Irene Beyerlein¹; Jian Wang¹; Nathan Mara¹; Nathan Mara¹; ¹Los Alamos National Laboratory

2:30 PM Keynote

Thermo-Mechanical Solution of Film/Substrate Systems under Local Thermal Load and Its Applications: Huiling Duan¹; ¹Peking University

3:00 PM

Computational and Experimental Investigation of the Interfacial Dynamic Compressive Behavior of High Strength Aluminum Alloys: William Lee¹; Pratheek Shanthraj¹; Hanadi Salem²; Mohammed Zikry¹; ¹North Carolina State University; ²The American University in Cairo

3:15 PM

Deformation Mechanisms of Hall-Petch Strengthening in Bimodal Nanocrystalline Materials: Chandra Pande¹; ¹Naval Research Laboratory

3:30 PM

Exploring and Exploiting Physical Properties of Molecular Crystals Subjected to Mechanical Milling: M. Teresa Carvajal¹; Yuanyuan Jing¹; Andrew Otte¹; John Blendell¹; ¹Purdue University

3:45 PM Break

3:55 PM Keynote

Characterization and Modeling of Heterogeneous Deformation near Grain Boundaries in Titanium and Ti-5Al-2.5Sn: Thomas Bieler¹; Darren Mason²; Claudio Zambaldi³; Philip Eisenlohr³; Chen Zhang¹; Hongmei Li¹; Leyun Wang¹; Yiyi Yang¹; Carl Boehlert¹; Martin Crimp¹; Rozaliya Barabash⁴; Wenjun Liu⁵; ¹Michigan State University; ²Albion College; ³Max-Planck-Institut für Eisenforschung; ⁴Oak Ridge National Laboratory; ⁵Argonne National Laboratory



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MONDAY PM

4:25 PM Keynote

Phase Field Modeling for the Effects of Coherency Stress and Vacancy Source/Sinks on the Interface Sharpening and Intermixing Rate in Coherent Nano-Multilayers: Haibo Wan¹; Yao Shen¹; Xuejun Jin¹; ¹Shanghai Jiao Tong University

4:55 PM

Electron Backscatter Diffraction (EBSD) Measured Boundary Characteristics of Cu/Nb Nanolamellar Composites Fabricated by Accumulative Roll Bonding (ARB): Rodney McCabe¹; John Carpenter¹; Jonathan Ledonne²; Anthony Rollett²; Nathan Mara¹; ¹Los Alamos National Laboratory; ²Carnegie Mellon University

5:10 PM

Chemical Changes Underlying Aging of Silica in Nano-mechanical Contacts: Yun Liu¹; Izabela Szlufarska¹; ¹University of Wisconsin - Madison

5:25 PM

Interfacial Response of Friction-Welded 304-Stainless Steel and 6061-Al in Tension: Cheng Liu¹; Manuel Lovato¹; William Blumenthal¹; ¹Los Alamos National Laboratory

Mechanical Performance of Materials for Current and Advanced Nuclear Reactors: Mechanical and Small-Scale Testing of Reactor Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Nicholas Barbosa, National Institute of Standards & Tech; Greg Oberson, United States Nuclear Regulatory Commission; Matthew Kerr, United States Nuclear Regulatory Commission; Elaine West, Knolls Atomic Power Laboratory; Stuart Maloy, Los Alamos National Laboratory; Osman Anderoglu, LANL

Monday PM

March 12, 2012

Room: Swan 1

Location: Swan Resort

Session Chairs: Greg Oberson, Nuclear Regulatory Commission; Nick Barbosa, NIST

2:00 PM Invited

A Perspective on Current Challenges in Development and Application of Uniaxial Micro-scale Testing Techniques to Characterize the Mechanical Properties of Materials: Paul Shade¹; Michael Uchic¹; Dennis Dimiduk¹; ¹Air Force Research Laboratory

2:30 PM Invited

Benefits and Challenges of Small Scale Materials Testing for Nuclear Application: Peter Hosemann¹; Daniel Kiener²; Stuart Maloy³; Jenny Martos¹; ¹UC Berkeley; ²Montanuniversitaet leoben; ³LANL

3:00 PM

Compatibility of MYRRHA Candidate Structural Materials with Lead-Bismuth Eutectic Environment: Effect of Strain Rate and Low Dissolved Oxygen Concentration: Gunter Coen¹; Joris Van den Bosch¹; Serguei Gavrilov¹; ¹SCK-CEN

3:20 PM

Mechanical Testing of Nuclear Materials Using a MEMS Approach: Nicholas Barbosa¹; David Read¹; ¹National Institute of Standards & Tech

3:40 PM

Grain Size Effects in Micro-Scale Tensile Testing of 316L Stainless Steel: Whitney Poling¹; Nicholas Barbosa²; Kip Findley¹; David Read²; ¹Colorado School of Mines; ²National Institute of Standards and Technology

4:00 PM Break

4:20 PM

Small Specimen Testing for Evaluating Radiation-Induced Changes in Mechanical Properties of Structural Reactor Materials at High Irradiation Doses: Ellen Rabenberg¹; Kyle Knori¹; Brian Jaques¹; Bulent Sencer²; Darryl Butt¹; F.A. Garner³; ¹Boise State University; ²Idaho National Laboratory; ³Radiation Effects Consulting

4:40 PM

Study of Size and Irradiation Effects on Mechanical Properties of Silicon Carbide Micropillars: Chansun Shin¹; Hyung-Ha Jin¹; Dong-Jin Kim¹; Junhyun Kwon¹; ¹Korea Atomic Energy Research Institute

5:00 PM

Multi-Axial Mechanical Behavior of Zircaloy-4 and Effect on Initial Texture: Akawat Siriruk¹; Matthew Kant¹; Dayakar Penumadu¹; Elena Garlea²; ¹University of Tennessee; ²Y-12 National Security Complex

Nanocomposites: Processing of Nanocomposites I

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Composite Materials Committee

Program Organizers: Garth Wilks, Air Force Research Laboratory; Jonathan Spowart, Air Force Research Laboratory; Meisha Shofner, Georgia Institute of Technology; John Zhanhu Guo, Lamar University

Monday PM

March 12, 2012

Room: Swan 8

Location: Swan Resort

Session Chairs: Brandon Howe, Air Force Research Laboratory; Garth Wilks, Air Force Research Laboratory

2:00 PM

Development of Al and Co Nanowires by the Method of Phase Separation: Tanjore Jayaraman¹; Yuan Tian¹; Jeremy Anderson¹; Jeffrey Shield¹; ¹University of Nebraska

2:20 PM

Thermal Modeling of Carbon Nanotube Growth Experiments: Kevin Maxwell¹; Benji Maruyama¹; Jaimie Tiley¹; ¹US Air Force Research Laboratory

2:40 PM

Boron Nitride Nanotube Reinforced Aluminum Nanocomposites: Debrupa Lahiri¹; Virendra Singh²; Mingdong Bao¹; Luhua Li³; Sudipta Seal²; Ying Chen³; Arvind Agarwal¹; ¹Florida International University; ²University of Central Florida; ³Deakin University

3:00 PM

Fabrication of Aluminum Matrix Composite Reinforced by Intermetallic Compounds of Various Nano/Micro-Architectures: Can Zhu¹; Yufeng Wu¹; Gap-Yong Kim¹; ¹Iowa State University

3:20 PM Break

3:40 PM Invited

From Hard Coatings to Thermoelectrics: Effects of Nanostructure on Fundamental Physical Properties of Hf_{1-x}Al_xN Alloys: Brandon Howe¹; Andrey Voevodin¹; Joseph Greene²; Ivan Petrov²; ¹Air Force Research Laboratory; ²University of Illinois

4:20 PM

Formation of Nano Dispersed Ceramic-Metallic Composite Coatings: Ratan Saha¹; M Farrokhzad¹; T Khan¹; ¹University of Calgary

4:40 PM

Microtruss Cellular Nanocomposites: *Khaled Abu Samk*¹; Guojie Huang²; Milan Skocic³; Hatem Zurob²; David Embury²; Olivier Bouaziz⁴; Glenn Hibbard¹; ¹University of Toronto; ²McMaster University; ³Grenoble Institut of Technology; ⁴ArcelorMittal Research

5:00 PM

Manufacturing and Characterization of an Auxetic Composite: *Fu-Pen Chiang*¹; ¹Stony Brook University

5:20 PM

Discarded Ultrafine Particulate Carbonaceous Materials Used as Reinforcers of Rubber Vulcanized Products: *Guillermo Martín-Cortés*¹; Fabio Esper¹; Luiz Sálvio Galvão Dantas²; Wildor Hennies³; Francisco Valenzuela-Díaz³; ¹Universidade Estácio de Sá; ²Bentonisa-Bentonita do Nordeste S.A.; ³Polytechnic School-University of São Paulo

5:40 PM

Properties of Additional Reinforcers Materials Used to Complement NAOB – A Rubber / Organoclay Nanocomposite Material: *Fabio Esper*¹; Guillermo Martín-Cortés¹; Luis Sálvio Dantas²; Adriana Cutrim²; Wildor Hennies³; Francisco Valenzuela-Díaz³; ¹Universidade Estácio de Sá; ²Bentonisa - Bentonita do Nordeste S.A.; ³Escola Politécnica da Universidade de São Paulo

Neutron and X-Ray Studies of Advanced Materials V: Centennial: In Honor of Dr. Gabrielle Long

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Xun-Li Wang, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Lyle Levine, National Institute of Standards and Technology; Peter Liaw, Univ of Tennessee; Yandong Wang, Beijing Institute of Technology; Brent Fultz, California Institute of Technology

Monday PM
March 12, 2012

Room: Southern I
Location: Dolphin Resort

Funding support provided by: Office of Basic Energy Sciences, U.S. Dept. of Energy, Dr. P. Thiyagarajan

Session Chairs: Lyle Levine, NIST; Andrew Allen, NIST

2:00 PM Introductory Comments Lyle Levine**2:05 PM Keynote**

Microstructural Changes in Nanotwinned Cu Resulting from Unidirectional and Reversed High Pressure Torsion: C. Shute¹; Y. Liao¹; K. Tsuchiya²; Y. Zhu³; A. Hodge⁴; T. Barbee⁵; *Julia Weertman*¹; ¹Northwestern University; ²National Institute of Materials Science; ³North Carolina State University; ⁴University of Southern California; ⁵Lawrence Livermore National Laboratory

2:30 PM Invited

The Ultra-Small Angle X-Ray Scattering Instrument (USAXS) Instrument – Delivering Unique Science for More Than 25 Years: *Jan Ilavsky*¹; Peter Jemian¹; ¹APS, Argonne National Laboratory

2:50 PM Invited

Small-Angle Neutron Scattering Studies of Cement Hydration: *Andrew Allen*¹; Jeffrey Thomas²; Hamlin Jennings³; ¹NIST; ²Schlumberger-Doll Research; ³MIT

3:10 PM

Ultra-Small-Angle X-Ray Scattering—X-Ray Photon Correlation Spectroscopy Studies of Equilibrium and Nonequilibrium Dynamics: *Fan Zhang*¹; Andrew Allen¹; Lyle Levine¹; Jan Ilavsky²; Gabrielle Long²; ¹National Institute of Standards and Technology; ²Argonne National Laboratory

3:25 PM Invited

Probing Materials' Reactivity Using X-Ray Pair Distribution Function Methods: *Karena Chapman*¹; ¹Argonne National Laboratory

3:45 PM Invited

The Many Facets of Guinier-Preston Zones in Al-Rich Al-Ag: *Gernot Kostorz*¹; ¹ETH Zurich

4:05 PM Break**4:10 PM**

The Bonse-Hart Ultra-Small-Angle Scattering Camera Worldwide: Current Status: *Pete Jemian*¹; ¹Argonne National Laboratory

4:25 PM Invited

Waveguide-Enhanced Grazing-Incidence X-Ray Scattering: Probing Buried Nanostructures in Thin Films in Three Dimensions: *Jin Wang*¹; Zhang Jiang¹; ¹X-ray Science Division, Argonne National Laboratory

4:45 PM Invited

Interrelation between Grain-Size-Induced and Strain-Induced Broadenings of X-Ray Diffraction Profiles: What We Can Learn from It about Nano-Structured Materials?: *Emil Zolotayabko*¹; ¹Technion

5:05 PM Invited

Studies of the Early Stages of Temperature Induced Glass Devitrification: *Wim Bras*¹; G Neville Greaves²; Simon Clark³; Martin Kunz³; Vladimir Martis⁴; Sabyasachi Sen⁵; ¹Netherlands Organization for Scientific Research; ²University of Wales; ³Lawrence Berkeley Laboratory; ⁴University College London; ⁵UC Davis

5:25 PM

Directly Imaging Microstructures Using Ultra-Small-Angle X-Ray Scattering: *Lyle Levine*¹; Gabrielle Long¹; Fan Zhang¹; Jan Ilavsky²; ¹National Institute of Standards and Technology; ²Advanced Photon Source

5:40 PM Invited

Measurement of S(q) as q → 0 in Amorphous Si: *Gabrielle Long*¹; Ruobing Xie¹; Steven Weigand¹; Simon Moss²; Sjoerd Roorda³; Salvatore Torquato⁴; Paul Steinhardt⁴; ¹Argonne National Laboratory; ²University of Houston; ³Université de Montréal; ⁴Princeton University



TMS 2012

141st Annual Meeting & Exhibition

MONDAY PM

Pb-Free Solders and Other Materials for Emerging Interconnect and Packaging Technologies: Studies of Mechanical Properties and Effects of Current II

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Iver Anderson, Ames Laboratory; Sung Kang, IBM; Albert Wu, National Central Univ; Laura Turbini, Research in Motion; Tae-Kyu Lee, Cisco Systems; Govindarajan Muralidharan, Oak Ridge National Lab; John Elmer, Lawrence Livermore National Lab; Yan Li, Intel

Monday PM Room: Swan 9
March 12, 2012 Location: Swan Resort

Session Chair: Tae-Kyu Lee, Cisco Systems

2:00 PM Invited

EBSD Investigation of the Relationship between Sn Orientation and IMC Evolution during Electromigration in Idealized SnAgCu Interconnects: *Christopher Kinney*¹; Xioranny Linares¹; Kyu-Oh Lee²; Fay Hua²; J.W. Morris¹; ¹U.C. Berkeley; ²Intel Corporation

2:25 PM Invited

Effects of Zn Addition on Electromigration Behavior of Sn-1Ag-0.5Cu Solder Interconnect: H. Liu¹; Q. Zhu¹; J. Guo¹; *J. Shang*²; ¹Institute of Metal Research; ²University of Illinois

2:50 PM

A New Physical Model for Rapid Life Prediction of Pb-Free Flip Chip Solder Joints in Electromigration Tests: *Tian Tian*¹; Feng Xu²; Jung Kyu Han¹; Daechul Choi¹; Yin Cheng²; Lukas Helfen²; Marco Michiel³; Tilo Baumbach²; King-Ning Tu¹; ¹UCLA; ²Karlsruhe Institute of Technology; ³ESRF

3:10 PM

Microstructural Evolution in Nearly Bi-Layered, Two-Phase Alloys from Current Stressing: *Andre Lee*¹; K.N. Subramanian¹; ¹Michigan State University

3:30 PM

No Current Crowding to Current Crowding Transition in Pb-free Solder Joint with Extremely Thick Cu: *Jung Kyu Han*¹; Daechul Choi¹; Masaru Fujiyoshi²; King-Ning Tu¹; ¹UCLA; ²Hitachi Metals, Ltd.

3:50 PM Break

4:00 PM

Effect Of Alloying Elements On Electrification-Fusion Phenomenon Of Sn-based Eutectic Alloys: *Gong-An Lan*¹; Truan-Sheng Lui¹; Li-Hui Chen¹; ¹Chung-Kung University, Tainan, Taiwan

4:20 PM

Irregular Cu Cathode Dissolution in Solder Joints under Electron Current Stressing: *Jia-Hong Ke*¹; Ting-Jia Huang¹; Ting-Li Yang¹; C. Robert Kao¹; ¹Department of Materials Science & Engineering, National Taiwan University

4:40 PM

Influence of Cu Column Under-Bump-Metallizations on Current Crowding and Joule Heating Effects of Electromigration in Flip-chip Solder Joints: *Yu-Chun Liang*¹; W. A. Tsao¹; Chih Chen¹; Da-Jeng Yao²; Yi-Shao Lai³; ¹National Chiao Tung University; ²National Tsing Hua University; ³Central Laboratories, Advanced Semiconductor Engineering, Inc.

5:00 PM

Study of Joule Heating Effects in Eutectic SnPb and SnAg Solder Joints under High Current Density: *Xu Zhang*¹; Sihao Liu¹; Limin Ma¹; Guangchen Xu¹; Fu Guo¹; ¹Beijing University of Technology

5:20 PM

Comparison of Electromigration Induced Failure between 3D IC and Flip Chip Solder Joints: *Hao Hsu*¹; Fan-Yi Ouyang¹; ¹Department of Engineering and System Science, National Tsing Hua University, Taiwan

5:40 PM

Study of Electromigration Tests in Ultra-Low-Bump-Height Lead-Free Solder Joints with Nickel UBM Using Kelvin Bump Structure: *Ping Ju Ho*¹; Yuan-Wei Chang¹; Chih Chen¹; ¹National Chiao Tung University

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XI: Phase Equilibria and Transformations of the Pb-free Solders and Thermoelectric Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikuo Ohnuma, Tohoku University; Clemens Schmetterer, TU Bergakademie Freiberg; Yee-Wen Yen, National Taiwan University of Science and Technology; Shih-Kang Lin, University of Wisconsin – Madison

Monday PM Room: Swan 10
March 12, 2012 Location: Swan Resort

Session Chairs: Ikuo Ohnuma, Tohoku University; Clemens Schmetterer, TU Bergakademie Freiberg

2:00 PM Invited

Directional Solidification and Liquidus Projection of Sn-Co-Cu Alloys: Kai-Wen Pan¹; *Sinn-Wen Chen*¹; Chia-Ming Hsu¹; Che-Wei Hsu¹; ¹National Tsing Hua University

2:20 PM

Early Stages of Solidification in Sn-Cu and Sn-Cu-Ni Solders: *Christopher Gourlay*¹; Sergey Belyakov¹; Adrian Chiang¹; ¹Imperial College London

2:35 PM

Unidirectional Solidification of Eutectic Alloys in Thermoelectric Pb-Ag-Sb-Te: *Hsin-Jay Wu*¹; Sinn-Wen Chen¹; Teruyuki Ikeda²; G. Jeffery Snyder²; ¹National Tsing Hua university; ²Materials Science, California Institute of Technology

2:50 PM

Phase Equilibria and Solidification of Ternary Sn-In-Cu Alloys: *Shih-Kang Lin*¹; Sinn-Wen Chen²; ¹National Cheng Kung University; ²National Tsing Hua University

3:05 PM

Microstructure Formation and Phase Stability in Sn-Rich Sn-Ni Alloys: *Sergey Belyakov*¹; Christopher Gourlay¹; ¹Imperial College London

3:20 PM

Transformation Kinetics and Dimensional Stability of Cu₆Sn₅: *Kazuhiro Nogita*¹; Stuart McDonald¹; Dekui Mu¹; Christopher Gourlay²; Keith Sweatman³; Testuro Nishimura³; ¹The University of Queensland; ²Imperial College London; ³Nihon Superior Co. Ltd.

3:35 PM Break**3:50 PM Invited**

Materials for HT Lead Free Soldering and Development of the Thermodynamic Database for Relevant Materials: *Ales Kroupa*¹; Alan Dinsdale²; Andrew Watson³; Jan Vrestal⁴; Adela Zemanova¹; Pavel Broz⁴; ¹Institute of Physics of Materials, ASCR; ²National Physical Laboratory; ³Institute for Materials Research, University of Leeds; ⁴Department of Chemistry, Masaryk University

4:10 PM

Time-Temperature-Transformation Diagrams of High Purity Powdered Tin: *Kazuhiro Nogita*¹; Stuart McDonald¹; Jonathan Read¹; Shoichi Suenaga²; ¹The University of Queensland; ²Nihon Superior Co. Ltd.

4:25 PM

Thermoelectric Materials Design Based on Phase Separation between Half-Heusler MNiSn and Heusler M(Ni,Co)₂Sn (M = Hf, Zr): *Yoshisato Kimura*¹; Naoko Katou¹; Yaw-Wang Chai¹; ¹Tokyo Institute of Technology

4:40 PM

Diffusion Mobilities in the Face Centered Phase in the Ag – Cu – In – Sn System: *Wojciech Gierlotka*¹; Md. Azizul Haque¹; ¹YuanZe University

4:55 PM

Evaluation of Diffusion Barrier between SAC305 and Tellurium: *Chang-Yen Ko*¹; Albert T. Wu¹; Tai-Yin Lin¹; ¹National Central University Dep. Chemical and Materials Engineering

Processing to Control Morphology and Texture in Magnetic Materials: Processing to Enhance Performance in Rare Earth Permanent Magnets

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Matthew Kramer, Iowa State University; Mike McHenry, Carnegie Mellon University; David Laughlin, Carnegie Mellon University; Jinfang Liu, Electron Energy Corporation; Bill Soffa, University of Virginia; Ivan Skorvanek, Institute of Experimental Physics

Monday PM
March 12, 2012

Room: Europe 10
Location: Dolphin Resort

Session Chairs: Matthew Williard, Naval Research Laboratory; Oliver Gutfleisch, IFW Dresden

2:00 PM Invited

Advanced Processing and Microstructure of High Performance Permanent Magnets: *Oliver Gutfleisch*¹; Thomas Woodcock¹; Konrad Güth¹; Juliane Thielsch¹; Martina Moore¹; Simon Sawatzki¹; ¹IFW Dresden

2:25 PM Invited

Restructuring of Grain Boundaries of Sintered NdFeB Magnets
: *Mi Yan*¹; ¹Zhejiang University

2:50 PM

Investigation of a Unique Texturing Mechanism in Ag-Containing RE₂Fe₁₄B Alloys: Nathaniel Oster¹; Daniel Cavanaugh²; Kevin Dennis²; R. McCallum²; Matthew Kramer²; *Iver Anderson*²; ¹Iowa State University; ²Ames Laboratory

3:05 PM

Thermodynamics Effect of Magnetic Field on the Solidification of Fe-Nd Eutectic: *Sophie Rivoirard*¹; Eric Beaugnon¹; Thomas¹; ¹CNRS

3:20 PM

Studies of Anisotropic MRE-Fe-B Magnets Fabricated by Hot Deformation in a Vacuum Hot Press (MRE=Nd+Y+Dy): *Wei Tang*¹; Kevin Dennis¹; Nathaniel Oster¹; Matt Kramer¹; Iver Anderson¹; Ralph McCallum¹; ¹Iowa State University

3:35 PM Break**3:55 PM Invited**

Effect of Particle Size on the Coercivity of R-Fe-B (R=Nd, Pr) Powders Prepared by Surfactant-Assisted Ball Milling: Nilay Gunduz Akdogan¹; Dan Neil¹; Chris Brown¹; Wanfeng Li¹; Dimitris Niarchos²; *George Hadjipanayis*¹; ¹University of Delaware; ²NCSR ‘‘Demokritos’’

4:20 PM Invited

Fabrication of Anisotropic Nanostructured Rare-Earth Bonded Magnets: *J.P. Liu*¹; ¹University of Texas-Arlington

4:45 PM Invited

Textured Polycrystalline Permanent Magnet Nanoflakes: *Jinfang Liu*¹; Baozhi Cui¹; ¹Electron Energy Corporation

5:10 PM

Novel Sm-Fe-N Nanoflakes with High Coercivities: *Nilay Gunduz Akdogan*¹; Wanfeng Li¹; Alexander Gabay¹; George Hadjipanayis¹; ¹University of Delaware

5:25 PM

Cluster Synthesis, Direct Ordering and Alignment of Rare-Earth Transition-Metal Nanomagnets: *Balamurugan Balasubramanian*¹; Ralph Skomski¹; Jeffrey Shield¹; George Hadjipanayis²; David Sellmyer¹; ¹University of Nebraska; ²University of Delaware

Randall M. German Honorary Symposium on Sintering and Powder-Based Materials: Current Activated and Conventional Sintering

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee
Program Organizers: K. Morsi, San Diego State University; Fernand Marquis, Naval Postgraduate School; John Meyer, Iowa State University; Ahmed El-Desouky, San Diego State University; Eugene Olevsky, San Diego State University

Monday PM
March 12, 2012

Room: Oceanic 2
Location: Dolphin Resort

Session Chair: Javier Garay, University of California-Riverside

2:00 PM Invited

Development of a Simple Empirical Model for Current Activated Pressure Assisted Densification: *J. Garay*¹; A. Dupuy¹; ¹UC Riverside

2:25 PM Invited

Issues in Transforming SPS (FAST) into a Viable Manufacturing Solution: *James Sears*¹; ¹South Dakota School of Mines & Technology

2:50 PM

Advances in Current Activated Tip-Based Sintering (CATS): *Ahmed El Desouky*¹; Kee Moon¹; Sam Kassegne¹; Joanna McKittrick²; Khaled Morsi¹; ¹SDSU; ²UCSD

3:05 PM

Low-Thermal Load Consolidation of Sm-Fe-N Flake Powder by Combination of Cyclic Compression and Current Sintering: *Kenta Takagi*¹; Hiroyuki Nakayama¹; Kimihiro Ozaki¹; ¹National Institute of Advanced Industrial Science and Technology (AIST)



TMS 2012

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MONDAY PM

3:20 PM

Fabrication of TiN / Fe-Al Cermet from Mixture of TiN, Fe and Al Powders: *Hiroyuki Nakayama*¹; Kimihiro Ozaki¹; Keizo Kobayashi¹; ¹National Institute of Advanced Industrial Science and Technology

3:35 PM Break

3:50 PM Invited

Liquid Phase Sintering of NiTi: *David Dunand*¹; ¹Northwestern University

4:15 PM

The Effect of Powder Morphology on the Sintering Behavior of Ti and Ti Alloy Powders

: *Wei Chen*¹; Yukinori Yamamoto¹; William Peter¹; Michael Clark¹; Stephen Nunn¹; Jim Kiggans¹; Thomas Muth¹; Ryan Dehoff¹; Craig Blue¹; Brian Fuller²; Kamal Akhtar²; ¹Oak Ridge National Laboratory; ²Cristal US, Inc./ International Titanium Powder

4:30 PM

Transparent Polycrystalline Alumina Obtained by SPS: Single and Double Doping Effect: *Burcu Apak*¹; Halide Esra Kanbur¹; Esra Ozkan Zayim¹; Gultekin Goller¹; Onuralp Yucel¹; Filiz Cinar Sahin¹; ¹Istanbul Technical University

4:45 PM

Effect of TiC Addition on Sintering Behavior of ZrC: Burak Acicbe¹; Ipek Akin¹; Filiz Sahin¹; Onuralp Yucel¹; *Gultekin Goller*¹; ¹Istanbul Technical University

5:00 PM

Sintering of Nanocrystalline Tungsten Powder: *William de Rosset*¹; ¹Army Research Laboratory

5:15 PM

Mechanical Properties of Spark Plasma Sintered ZrC-SiC Composites: Sumbule Sagdic¹; Ipek Akin¹; Filiz Sahin¹; Onuralp Yucel¹; *Gultekin Goller*¹; ¹Istanbul Technical University

Science and Engineering of Light Metal Matrix Nanocomposites and Composites: Nanocomposites and Composites

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division

Program Organizers: Xiaochun Li, University of Wisconsin-Madison; Alan Luo

Monday PM

March 12, 2012

Room: Macaw 2

Location: Swan Resort

Session Chair: Hongseok Choi, University of Wisconsin-Madison

2:00 PM

Uniform Dispersion of Nanoparticles in Metal Matrix Nanocomposites: *Lianyi Chen*¹; Hongseok Choi¹; Axel Fehrenbacher¹; Jiaquan Xu¹; Chao Ma¹; Xiaochun Li¹; ¹University of Wisconsin Madison

2:20 PM

Effect of Particle Size Distribution on the Response of Particle Reinforced Metal Matrix Composites: *Brandon McWilliams*¹; KT Ramesh²; Chian Yen¹; ¹US Army Research Laboratory; ²Johns Hopkins University

2:40 PM

Microstructure and Mechanical Properties of Gas Atomized CP Ti Containing Y₂O₃ and TiB: *Vincent Hammond*¹; Sesh Tamirisakandala²; Brady Butler¹; William Hanusiak²; ¹Army Research Laboratory; ²FMW Composite Systems

3:00 PM

An Investigation on the Capability of Equal Channel Angular Pressing for Consolidation of Aluminum and Aluminum Composite Powder: *Reza Derakhshandeh Haghi*¹; Ahmad Jenabali Jahromi²; ¹Fars Science and Research Branch, Islamic Azad University; ²Shiraz University

3:20 PM

Effect of Core-shelled Nanoparticles of Carbon-Coated Nickel on Magnesium: *Yi Sun*¹; Hongseok Choi¹; Hiromi Konishi¹; Vadim Pikhovich²; Robert Hathaway²; Xiaochun Li¹; ¹University of Wisconsin Madison; ²Oshkosh Corporation

3:40 PM Break

3:55 PM

Microstructural Control during In-Situ Synthesis of (AlN+Mg₂Si)/Mg Matrix Composites: *Xiao Ma*¹; David Johnson¹; Kevin Trumble¹; ¹Purdue University

4:15 PM

In Situ Composite of (Mg₂Si)/Al-Si-Cu Fabricated by Squeeze Casting: *Huseyin Lus*¹; Gokhan Ozer¹; Kerem Guler¹; ¹Yildiz Technical University

4:35 PM

SiCp/Mg-Zn-Ca-Mn Mg Matrix Composites Fabricated by Stir Casting: *Xiaojun Wang*¹; K.B. Nie²; K Wu²; X.S Hu²; M.Y Zheng²; ¹Harbin Institute of Technology; ²Harbin Institute of Technology

4:55 PM

Ultrasonically Processed AS41 Magnesium Alloy Matrix Composites: Neeraj Srivastava¹; *Gajanan Chaudhari*¹; S.K. Nath¹; ¹IIT Roorkee

5:15 PM

Optimization of Tensile Strength of Friction Stir Welded Al-(10 to 14 wt.%) TiB₂ Metal Matrix Composites: *Santhiyagu Joseph Vijay*¹; Natarajan Murugan²; Siva Parameswaran³; ¹Karunya University; ²Coimbatore Institute of Technology; ³Texas Tech University

Solar Cell Silicon: Silicon Production

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Conversion and Storage Committee, TMS: Recycling and Environmental Technologies Committee
Program Organizers: Arjan Ciftja, SINTEF; Gabriella Tranel, Norwegian University of Science and Technology; Gregory Hildeman, Consultant; Shadia Ikhmayies, Al Isra University

Monday PM

March 12, 2012

Room: Europe 7

Location: Dolphin Resort

Session Chair: Arjan Ciftja, SINTEF Materials and Chemistry

2:00 PM Introductory Comments

2:05 PM

An Investigation into the Electrochemical Production of Si by the FFC Cambridge Process: Emre Ergül¹; Ishak Karakaya²; Metehan Erdogan²; *Fuat Erden*²; ¹Aselsan Inc.; ²Department of Metallurgical and Materials Engineering, Middle East Technical University

2:30 PM

Distribution of Boron and Phosphorus during Alloying and Slag Treatment of Metallurgical Grade Silicon: *Yulia Meteleva-Fischer*¹; Yongxiang Yang²; Rob Boom¹; Bert Kraaijeveld³; Henk Kuntzel³; ¹Materials innovation institute/TU Delft; ²Delft University of Technology; ³Solwafer B.V.

2:50 PM

Experimental and Molecular Simulation Studies of Silicon Production in an Microwave Furnace: *Jan-Philipp Mai*¹; Gabriele Raabe²; Juergen Koehler²; ¹JPM Silicon GmbH; ²University of Braunschweig - Institute of Technology

3:10 PM Break**3:30 PM**

Improved Material Efficiency in the Si Deposition from SiHCl₃ under Mesoplasma Condition: *Makoto Kambara*¹; Toyonobu Yoshida¹; ¹The University of Tokyo

3:50 PM

Impurities Distribution between SiO Gas and Reactant Materials in a Silicon Furnace: *Elena Dal Martello*¹; Gabriella Tranel²; Oleg Ostrovski³; Guangqing Zhang³; Ola Raaness⁴; Kai Tang⁴; ¹NTNU ; ²NTNU; ³UNSW; ⁴SINTEF

4:10 PM

The Kinetics of Boron Removal during Slag Refining in the Production of Solar-Grade Silicon: *Egil Krystad*¹; Shuang Zhang¹; Gabriella Tranel¹; ¹NTNU

4:30 PM

Raman Spectroscopic Study of the Structural Modifications Associated with the Addition of Calcium Oxide and Boron Oxide to Silica: *Jeff Kline*¹; Merete Tangstad¹; Gabriella Tranel¹; ¹NTNU

4:50 PM

Structure Silicon Deposits Obtained by Electrolysis SiO₂ in the Chloride-Fluoride Melts: *Oleg Chemezov*¹; Aleksey Apisarov¹; Andrey Isakov¹; Yurii Zaikov¹; ¹Institute of High-Temperature Electrochemistry Russian Academy of Science Ural Division

Solid-State Interfaces II: Toward an Atomistic-Scale Understanding of Structure, Properties, and Behavior through Theory and Experiment: Morphological Stability

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Xiang-Yang Liu, Los Alamos National Lab; Douglas Spearot, University of Arkansas; Guido Schmitz, University of Münster; David Seidman, Northwestern University

Monday PM
March 12, 2012

Room: Oceanic 7
Location: Dolphin Resort

Funding support provided by: Los Alamos National Laboratory

Session Chairs: David Seidman, Northwestern University; Emmanuelle Marquis, University of Michigan

2:00 PM Invited

Precipitates in Al-Cu Alloys Revisited: *Donald Siegel*¹; Aniruddha Biswas²; Christopher Wolverton³; David Seidman³; ¹University of Michigan; ²Bhabha Atomic Research Center; ³Northwestern University

2:30 PM Invited

Evolution of Hetero-Interfaces in Alloys Forced by Severe Plastic Deformation: *Pascal Bellon*¹; Robert Averback¹; Nhon Vo¹; Yinon Ashkenazy¹; Daniel Schwen¹; Elvan Ekiz¹; Tim Lach¹; Mohsen Pouryazdan²; Horst Hahn²; ¹University of Illinois; ²Karlsruhe Institute of Technology

3:00 PM

Ab Initio Study of Competitive Coherent Hydride Formation in Zirconium Alloys: Ludovic Thuinet¹; Rémy Besson¹; UMET

3:20 PM

Compositional Evolution of Q-Phase Precipitates in an Al-Alloy via 3-D Atom-Probe Tomography: *Aniruddha Biswas*¹; David Seidman²; ¹Bhabha Atomic Research Centre; ²Northwestern University

3:40 PM Break**3:45 PM**

Polyhedron Analysis for Structure Identification in Atomistic Simulations: Thomas Schabltzki¹; *Jutta Rogal*¹; Ralf Drautz¹; ¹Ruhr University Bochum

4:05 PM

Investigation of Interfacial Precipitation and Segregation in Ultra High Strength Steel with TEM and 3D Atom Probe: *Matthew Hartshorne*¹; Paul Novotny²; Michael Schmidt²; David Seidman³; Mitra Taheri¹; ¹Drexel University; ²Carpenter Technology Corporation; ³Northwestern University

4:25 PM

Fabrication and Characterization of Oriented Fe-Y₂Ti₂O₇ Interfaces: Implications to the Development and Optimization of Nanostructured Ferritic Alloys: *Tiberiu Stan*¹; Yuan Wu¹; G. Robert Odette¹; Kurt Sickafus²; Hanna Dabkowska³; Bruce Gaulin³; ¹University of California Santa Barbara; ²University of Tennessee; ³McMaster University

4:45 PM

Atomistic Simulations of Cu Growth on ZnO Surfaces Using COMB Potentials: *Yu-Ting Cheng*¹; Tao Liang¹; Bryce Devine¹; Beverly Hinojosa¹; Aravind Asthagiri²; Simon Phillipot¹; Susan Sinnott¹; ¹University of Florida; ²The Ohio State University

5:05 PM

Microscopic Study of Cu-based Dilute Cu-Nb-W Ternary System: *Xuan Zhang*¹; Pascal Bellon¹; Robert Averback¹; UIUC

5:25 PM

Characterization of Reaction Layers in Mn_{1.5}Co_{1.5}O₄ Coated Fuel Cell Interconnects: *Neal Magdefrau*¹; Lei Chen¹; John Yamanis¹; Ellen Sun¹; Mark Aindow²; ¹United Technologies Research Center; ²University of Connecticut



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141st Annual Meeting & Exhibition

MONDAY PM

Symposium in Memory of Patrick Veyssi re: Understanding the Mechanisms Controlling Plastic Flow: Plastic Flow

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division

Program Organizers: Georges Saada, LEM CNRS ONERA; Dennis Dimiduk, Air Force Research Laboratory; Hael Mughrabi, University Erlangen-Nuernberg; Haruyuki Inui, Kyoto University

Monday PM
March 12, 2012

Room: Europe 6
Location: Dolphin Resort

Funding support provided by: National Science Foundation

Session Chairs: D. Caillard, CEMES/CNRS; M. Niewczas, McMaster University

2:00 PM Invited

TEM Deformation Maps : Microstructure & Mechanical Behavior: *Muriel Veron*¹; Edgar Rauch¹; ¹SIMaP

2:30 PM Invited

Plastic Flow Heterogeneity and Yielding Instabilities: *Georges Saada*¹; Tomas Kruml²; I. Kubena³; ¹LEM CNRS ONERA; ² Institute of Physiscs of Materials Materials ; ³ Institute of Physiscs of Materials Materials

2:55 PM Invited

A Dislocation-Based Model for Interpretation of Strain Path Changes in Steel and Magnesium: *Carlos Tome*¹; Kohshiroh Kitayama²; Edgar Rauch³; Gabriela Vincze²; Jose Gracio²; Frederic Barlat⁴; ¹Los Alamos National Laboratory; ²University of Aveiro; ³Universite de Grenoble/ CNRS Grenoble; ⁴Pohang University of Science and Technology

3:25 PM Break

3:40 PM Invited

Finite Element Implementation of a Self-Consistent Polycrystal Plasticity Model: Application to a-Uranium: *Marko Knezevic*¹; Rodney McCabe¹; Ricardo Lebensohn¹; Carlos Tom e¹; Bogdan Mihaila¹; ¹Los Alamos National Laboratory

4:00 PM Invited

Modeling Plasticity and Cracks at the Atomic Scales within a Continuum Framework: *Pierre-Antoine Geslin*¹; Benoit Appolaire²; Alphonse Fine²; ¹LEM ONERA / CNRS ; ²LEM ONERA / CNRS

4:30 PM Invited

Spectral Elasto-Viscoplastic Formulation for the Prediction of Micromechanical Fields with Direct Input and Validation from Voxelized Data: *Ricardo Lebensohn*¹; Jette Oddershede²; Grethe Winther²; ¹Los Alamos National Laboratory; ²Risoe DTU

4:50 PM Invited

Binary and Ternary Interaction Coefficients in BCC Metals and Single Crystal Strain Hardening: *Ronan Maderc*¹; Ladislav Kubin²; ¹CEA, DAM, DIF; ²LEM (CNRS/ONERA)

Titanium: Advances in Processing, Characterization and Properties: Processing and Process Modeling II

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Christopher Szczepanski, US Air Force Research Laboratory; Vasisht Venkatesh, Pratt & Whitney

Monday PM
March 12, 2012

Room: Oceanic 3
Location: Dolphin Resort

Session Chairs: Michael Glavicic, Rolls-Royce Corporation; Vasisht Venkatesh, Pratt & Whitney

2:00 PM

Effect of Processing on Microstructure and Mechanical Properties of Ti-6Al-4V Fabricated Using Electron Beam Melting (EBM): *Nikolas Hrabe*¹; Ryan Kircher²; Timothy Quinn¹; ¹NIST; ²Medical Modeling

2:20 PM

Surface Tension and Viscosity of Industrial Ti-alloys Measured by the Oscillating Drop Method under Reduced Gravity Conditions: *Rainer Wunderlich*¹; Hans -Joerg FECHT¹; ¹Universitaet Ulm

2:40 PM

Fractographic Characterization of Electron Beam Freeform Fabrication [EBF3] Produced Ti-6Al-4V: *Cynthia Lach*¹; Robert Hafley¹; ¹NASA Langley Research Center

3:00 PM

Microstructure and Mechanical Properties of Ti-6Al-4V Fabricated by Selective Laser Melting: *Marco Simonelli*¹; Yau Yau Tse¹; Chris Tuck¹; ¹Loughborough University

3:20 PM

Computational Modeling of Aluminum Evaporation and Flow in Electron Beam Button Melting of Ti-6Al-4V: *Zhongkui Zhang*¹; Carl Reilly¹; Daan Maijer¹; Steve Cockcroft¹; ¹The University of British Columbia

3:40 PM

Computational Modeling of the Dissolution of Alloying Elements: *Jun Ou*¹; Aniruddha Chatterjee¹; Daan Maijer¹; Steve Cockcroft¹; Carl Reilly¹; ¹The University of British Columbia

4:00 PM Break

4:10 PM

Cost Effective and Eco-Friendly Process for Preparation of Wrought Pure Ti Material via Direct Consolidation of TiH₂ Powders: *Takanori Mimoto*¹; Nozomi Nakanishi¹; Thotsaphon Thruerujirapong¹; Junko Umeda¹; Katsuyoshi Kondoh¹; ¹Osaka University

4:30 PM

The Effect of Micro-Alloying on the Preform Fabrication of Titanium Alloys and the Forged Mechanical Properties: *Ma Qian*¹; Y. F. Yang¹; X. Wu²; S. D. Luo²; K. Xia²; C. J. Bettles³; G. B. Schaffer²; ¹The University of Queensland; ²The University of Melbourne; ³Monash University

4:50 PM

Linear Friction Welding of Titanium Alloys – Processing, Characterisation and Properties: *Hangyue Li*¹; Simon Bray²; Yina Guo¹; Jiayun Jiang¹; Robin Wilson¹; Paul Bowen¹; ¹The University of Birmingham; ²Rolls-Royce plc

5:10 PM

Deformation Mechanisms in near- α titanium Friction Stir Welds: Richard Fonda¹; Keith Knipling¹; Adam Pilchak²; ¹Naval Research Laboratory; ²Air Force Research Laboratory

5:30 PM

X-Ray Tomography of CP Titanium Friction Stir Welds Incorporating Fiducial Markers: Jennifer Wolk¹; Richard Everett²; Stephen Szpara¹; ¹Naval Surface Warfare Center; ²Naval Research Laboratory

5:50 PM

Effect of Dual-Laser Beam Welding on Microstructure Properties of Thin-Walled 947-TiAl Based Alloy Ti-45Al-5Nb-0.2C-0.2B (TNB): Jie Liu¹; Volker Ventzke¹; Peter Staron¹; Heinz-Günter Brokmeier¹; Michael Oehring¹; Nikolai Kashaev¹; Norbert Huber¹; ¹Institute of Materials Research, Helmholtz-Zentrum Geesthacht, Germany

T.T. Chen Honorary Symposium on Hydrometallurgy, Electrometallurgy and Materials Characterization: Copper Electrorefining

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee

Program Organizers: Shijie Wang, Rio Tinto Kennecott Utah Copper; J. E. Dutrizac, CANMET; Michael Free, University of Utah; J. Y. Hwang, Michigan Technological University; Daniel Kim, Rio Tinto Kennecott Utah Copper

Monday PM
March 12, 2012

Room: Oceanic 5
Location: Dolphin Resort

Funding support provided by: Rio Tinto Kennecott Utah Copper, ASARCO, and Freeport McMoRan

Session Chair: Michael Moats, The University of Utah

2:00 PM

METTOP-BRX-Technology – Industrial Application: Christine Wenzl¹; Andreas Filzwiesser¹; Stefan Konetschnik¹; ¹METTOP GmbH

2:20 PM

Implementing Wireless Electrolytic Cell Monitoring System at Kennecott Utah Copper for Improved Operational Efficiency: Ari Rantala¹; Daniel Kim²; ¹Outotec (Finland) Oy, Finland; ²Rio Tinto Kennecott Utah Copper

2:40 PM

Autoclave Pressure Oxygen Leaching Of Anodic Copper Slimes: Tracy Morris¹; Luis Navarro¹; ¹ASARCO LLC

3:00 PM

Mechanism and Thermodynamics of Floating Slimes Formation: Brent Hiskey¹; ¹University of Arizona

3:20 PM Break

3:30 PM

Detellurization Process of Copper Anodic Slimes Leach Liquor by Cementation of Tellurium Using Elemental Copper: Tracy Morris¹; Luis Navarro¹; Weldon Read¹; ¹ASARCO LLC

3:50 PM

New Process of Precipitation of Sb and Bi from Copper Electrolytes with PbO₂: Gerardo Cifuentes¹; Jaime Simpson²; Cristián Vargas¹; ¹USACH; ²ProPipe Ltda.

4:10 PM

Study of Electrolyte Impurity Precipitates at the Kennecott Refinery: Justin McAllister¹; Daniel Kim¹; Shijie Wang¹; ¹Rio Tinto

4:30 PM

Copper Refining Electrolyte Purification by the Use of Molecular Recognition Technology (MRT) for Bismuth Removal: Luis Navarro¹; Weldon Read¹; Tracy Morris¹; ¹ASARCO LLC

4:50 PM

Optimizing a Cascading Liberator: Bradford Weststrom¹; Omar Araujo¹; ¹Freeport-McMoRan Copper & Gold

5:10 PM

Copper Electrorefining Impurity Evaluation: Michael Free¹; Justin McAllister²; Urian Marshall¹; Megan Marshall¹; Daniel Kim²; Shijie Wang²; ¹University of Utah; ²Kennecott Utah Copper, LLC

Ultrafine Grained Materials VII: Deformation Mechanisms

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee

Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Xiaoxu Huang, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; Hyoung Seop Kim, POSTECH; Terence Langdon, University of Southern California; Terry Lowe, Manhattan Scientifics, Inc.; Ruslan Valiev, Ufa State Aviation Technical University; Xiaolei Wu, Institute of Mechanics, Chinese Academy of Sciences; Michael Zehetbauer, University of Vienna

Monday PM
March 12, 2012

Room: Swan 5
Location: Swan Resort

Session Chairs: Hyoung Seop Kim, POSTECH; Terence Langdon, University of Southern California; Ruslan Valiev, Ufa State Aviation Technical University; Xiaolei Wu, Institute of Mechanics, Chinese Academy of Sciences

2:00 PM Invited

Austenitic Steels Strengthened by Nano-Scale Twins: K. Lu¹; Nairong Tao¹; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences

2:20 PM

Twinning Phenomena in Cryomilled Pure Mg and Mg-Al-Zn Alloy Nanocrystalline Powders: Baolong Zheng¹; Ying Li²; Yizhang Zhou¹; Suveen Mathaudhu³; Enrique Lavernia¹; ¹University of California, Davis; ²Los Alamos National Laboratory; ³U.S. Army Research Office,

2:35 PM

An Elasto-Plastic Dislocation and Disclination Model for Small Scale Plasticity: Application to Grain Boundaries and Triple Junctions: Laurent Capolungo¹; Manas Upadhyay¹; Vincent Taupin²; Claude Fressengeas²; ¹Georgia Institute of Technology; ²Universite Paul Verlaine

2:50 PM

Effect of Stacking Fault Energy on the Microstructural Evolution of Pure Cu and Cu-Al Alloys during Severe Plastic Deformation: Xianghai An¹; Shiding Wu¹; Zhefeng Zhang¹; Roberto Figueiredo²; Nong Gao³; Terence Langdon⁴; ¹Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences; ²Department of Metallurgical and Materials Engineering; ³Materials Research Group, School of Engineering Sciences; ⁴Departments of Aerospace & Mechanical Engineering and Materials Science, University of Southern California



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3:05 PM

Effect of Stacking Faults and Twin Boundaries on Grain Refinement Induced by High-Pressure Torsion: *Yanbo Wang*¹; Xiaozhou Liao¹; Yonghao Zhao²; Enrique J. Lavernia²; Simon P. Ringer¹; Zenji Horita³; Terence G. Langdon⁴; Yuntian Zhu⁵; ¹The University of Sydney; ²University of California; ³Kyushu University; ⁴University of Southern California; ⁵North Carolina State University

3:20 PM Invited

Effects of Deformation Parameters and Stacking Fault Energy on Grain Refinement in Cu–Al Alloys Subjected to Plastic Deformation: *Nairong Tao*¹; Y. Zhang¹; K. Lu¹; ¹Shenyang National Laboratory for Materials Science Institute of Metal Research, Chinese Academy of Sciences

3:40 PM

The Influence of Dislocation Density on Dislocation-Twin Boundary Interactions in Nanocrystalline Materials: *Song Ni*¹; Yanbo Wang¹; Xiaozhou Liao¹; R.B. Figueiredo²; Hongqi Li³; S.P. Ringer¹; T.G. Langdon⁴; Yuntian Zhu⁵; ¹The University of Sydney; ²Federal University of Minas Gerais; ³Los Alamos National Laboratory; ⁴University of Southern California; ⁵Department of Materials Science & Engineering, North Carolina State University

3:55 PM Break

4:10 PM Invited

Deformation Mechanism of Columnar-Grained Cu with Preferentially Orientated Nanoscale Twins: *Lei Lu*¹; ¹Institute of Metal Research, CAS

4:30 PM

Deformation Twinning in Commercial Pure Titanium during Severe Plastic Deformation: *Yanjun Li*¹; Yongjun Chen²; John Walmsley¹; Hans Roven²; ¹SINTEF Materials and Chemistry; ²Department of Materials Science and Engineering, NTNU

4:45 PM

Mechanical Behavior of and Deformation Mechanisms in a Nanocrystalline Alloy: *Ruslan Valiev*¹; Dmitry Gunderov¹; Aleksander Lukyanov¹; ¹Ufa State Aviation Technical University

5:00 PM

Grain Refinement in Pure Titanium Processed by Severe Plastic Deformation: Y. Chen¹; Y. Li²; X. Xu³; J. Hjelen¹; H. Roven¹; ¹NTNU; ²SINTEF; ³Jiangsu University

5:15 PM

Grain Boundary Sliding in Ultra-Fine Grained 5083 Al: *Ming-Je Sung*¹; Jung Hun Han¹; Farghalli Mohame¹; ¹University of California, Irvine

5:30 PM

Structural and Mechanical Characterization of Nanostructured Al-1%Si Alloy Produced by Heavy Cold Rolling: *Tianlin Huang*¹; Qingshan Dong¹; Xu Gong¹; Xiaoxu Huang²; Qing Liu²; ¹Chongqing University; ²Risø National Laboratory for Sustainable Energy, Technical University of Denmark

5:45 PM

Processing of Ultrafine-Grained Nickel by Dislocation Activities at Intermediate Dynamic Strain Rate: Microstructure Evolution and Mechanical Properties: *Lukasz Farbaniec*¹; Guy Dirras¹; Akrum Abdul-Latif²; ¹LSPM - UPR3407 CNRS; ²Laboratoire d'Ingénierie des Systèmes Mécaniques et des Matériaux

2012 Functional and Structural Nanomaterials: Fabrication, Properties, Applications and Implications: 0-Dimensional Nanomaterials

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Jiyoung Kim, University of Texas; David Stollberg, Georgia Tech Research Institute; Seong Jin Koh, University of Texas at Arlington; Nitin Chopra, The University of Alabama; Terry Xu, UNC Charlotte

Tuesday AM
March 13, 2012

Room: Pelican 1
Location: Swan Resort

Session Chair: Terry Xu, University of North Carolina at Charlotte

8:30 AM Introductory Comments

8:35 AM Invited

Computational Study on Nanoparticles in Catalysis: Da Hye Kim¹; Hyun You Kim¹; Ji Hoon Ryu¹; *Hyuck Mo Lee*¹; ¹KAIST

9:10 AM

Characterization of Metallic Nano Particles Synthesized by Electrical Wire Explosion Technique for Catalytic Application: *Seung-Yub Lee*¹; Gwang-Yeob Lee²; Hyo-Soo Lee²; Min-Ha Lee²; ¹Columbia University; ²Korea Institute of Industrial Technology (KITECH)

9:30 AM

Citrate Mediated Wet Chemical Synthesis of Fe Doped Nanoapatites: A Model for Singly Doped Multifunctional Nanostructures: *Rajendra Kasinath*¹; Michael Klem¹; Robert Usselman²; ¹Montana Tech of the University of Montana; ²NIST-Boulder

9:50 AM

Selective Electrocatalytic Activity of Ligand Stabilized Copper Oxide Nanoparticles: *Christopher Matranga*¹; Douglas Kauffman¹; Paul Ohodnicki¹; Brian Kail¹; ¹US DOE- NETL

10:10 AM Break

10:25 AM

Preparation of Colloidal Quantum Dot Nanocrystals for Analysis by Atom Probe Tomography: *Sonal Padalkar*¹; Bhola Nath Pal²; Jennifer Hollingsworth²; Lincoln Lauhon¹; ¹Northwestern University; ²Los Alamos National Laboratory

10:45 AM

Supercapacitive Properties of Hydrothermally Synthesized Co₃O₄ Nanostructures: *David Mitlin*¹; Huatao Wang¹; Li Zhang¹; ¹University of Alberta and NINT NRC

11:05 AM

Synthesis and Silica Encapsulation of Magnetite Nanoparticles for Biomedical Applications: *Shampa Aich*¹; Pravin Dixit¹; ¹Indian Institute of Technology Kharagpur

2012 Symposium on Surfaces and Heterostructures at Nano- or Micro-Scale and Their Characterization, Properties, and Applications: Surfaces, Deposition, and Coatings

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Energy Conversion and Storage Committee, TMS: Nanomaterials Committee, TMS: Surface Engineering Committee, TMS: Young Leaders Committee, TMS: EMPMD Council

Program Organizers: Nitin Chopra, The University of Alabama; Ramana Reddy, The University of Alabama; Arvind Agarwal, Florida International University; Sandip Harimkar, Oklahoma State University; Jiyoung Kim, University of Texas at Dallas; Christopher Matranga, National Energy Technology Laboratory

Tuesday AM

March 13, 2012

Room: Pelican 2

Location: Swan Resort

Session Chairs: Sandip Harimkar, Oklahoma State University; Arvind Agarwal, Florida International University

8:30 AM

Microstructures and Performance of Sputter Deposited NiAl-Cr-Hf and NiAl-Cr-Zr Coatings: *Joel Alfano*¹; Mark Weaver¹; ¹Univ of Alabama

8:50 AM

New Trends in Superhydrophobic Coating Using PS/SiO₂

: *Ariosvaldo Sobrinho*¹; Marcos Baracho²; Rômulo Navarro¹; Felipe Mariz¹; José Nascimento¹; André Rodrigues²; ¹UAEMA / UFCG; ²UFC/DEMA

9:10 AM Invited

Production of SiC Using Thermal Plasma: M. Ramachandran¹; *Ramana Reddy*¹; ¹The University of Alabama

9:45 AM

Surface Nanostructuring of Steel 35 by Electrospark Machining with Electrodes Based on Tungsten Carbide and Added Al₂O₃ Nanopowder: *Sergey Nikolenko*¹; Nikolay Syuy¹; ¹Institute of Materials Science, Khabarovsk Scientific Center, Far Eastern Branch, Russian Academy of Sciences

10:05 AM Break

10:10 AM

Synthesis and Characterization of Oxide-Based Core/Shell Nanowires: Lyndon Smith¹; *Nitin Chopra*¹; ¹The University of Alabama

10:25 AM

Triboemission Phenomena: Electronic and Photonic Outputs from Surface Modification, and Its Use as Novel Probes for the Dynamics of Surface Processes: *Gustavo Molina*¹; Czeslaw Kajdas²; ¹Georgia Southern University; ²Automotive Industry Institute PIMOT

10:40 AM Invited

How and Why Do Whiskers Grow from Sn Coatings?: *Eric Chason*¹; Fei Pei¹; Nitin Jadhav¹; ¹Div of Engineering

11:10 AM Invited

Flexible, Transparent, Conducting Films of Copper Nanowires: *Benjamin Wiley*¹; ¹Duke University



TMS 2012

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11:40 AM Invited

Synthesis of Multifunctional Surface Nanocomposites with Tunable Size, Composition, and Properties: Ritesh Sachan¹; Sagar Yadavali¹; Nozomi Shirato¹; Gerd Duscher¹; Hernando Garcia²; Stephen Pennycook³; Anup Gangopadhyay⁴; *Ramki Kalyanaraman*¹; ¹University of Tennessee; ²Southern Illinois University in Edwardsville; ³Oak Ridge National Laboratory; ⁴Washington University in St. Louis

12:10 PM

Development of Nano-engineered Surfaces and Coating Technologies for Scale Mitigation: *Ghazal Azimi*¹; Yuehua Cui¹; J. David Smith¹; Kripa Varanasi¹; ¹MIT

3rd International Symposium on High Temperature Metallurgical Processing: Basic Research of Metallurgical Process

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Energy Committee, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Patrick Masset, TU Freiberg; Onuralp Yucel, Istanbul Technical University; Rafael Padilla, University of Concepcion; Guifeng Zhou, Wuhan Iron and Steel

Tuesday AM
March 13, 2012

Room: Southern II
Location: Dolphin Resort

Session Chairs: Onuralp Yucel, Istanbul Technical University; Bing Xie, Chongqing University

8:30 AM

JIM INTERNATIONAL SCHOLAR: Effect of Shear Stress on Crystallization Behavior of Mold Flux for Continuous Casting: *Noritaka Saito*¹; K. Kusada¹; S. Sukenaga¹; K. Nakashima¹; ¹Kyushu University

8:45 AM

Thermal Decomposition and Regeneration of Wüstite: *Zhiwei Peng*¹; Jiann-Yang Hwang¹; Zheng Zhang¹; Matthew Andriese¹; Xiaodi Huang¹; ¹Michigan Technological University

9:00 AM

Competitive Precipitation and Growth of Spinel Crystals in Vanadium Slag: *Xie Zhang*¹; Bing Xie¹; Jiang Diao¹; Xiaojun Li¹; ¹Chongqing University

9:15 AM

Expert System for Grate-Kiln Pellet Production Based on Mathematical Models of Temperature Field: *Xiaohui Fan*¹; Yi Wang¹; Xuling Chen¹; ¹Central South University

9:30 AM

The Influence of Sodium Oxide on the Distribution Behavior of Some Elements at the S-Furnace of the Mitsubishi Process: *Yusuke Kimura*¹; Ken-ichi Yamaguchi¹; ¹Mitsubishi Materials Corp.

9:45 AM

Effect of Temperature on the Equilibrium Phase Relations and Liquidus of CaO-SiO₂-FeOx-Al₂O₃ System: *Cuihuan Huang*¹; ¹Northeastern University

10:00 AM

Modelling of Slag Surface Tension from Thermodynamics: *Clemens Schmetterer*¹; Patrick Masset¹; ¹TU Bergakademie Freiberg

10:15 AM

Viscosity Determination of the Freeze Slag in Reaction Shaft of Flash Smelting Furnace: *Jinliang Wang*¹; Yanxin Wu¹; Liwei Liang¹; Chuanfu Zhang²; ¹Jiangxi University of Science and Technology; ²Central South University

10:30 AM Break

10:40 AM

Effect of MgO Content on Melting Features of SiO₂-CaO-MgO-Al₂O₃-FeO Slag in Nickel Laterite Metallurgy: *Xuewei Lv*¹; Cheng Pan¹; ¹Chongqing University, China

10:55 AM

High Temperature Deformation Behavior Of Nimonic C263 Superalloy: *Maribel De la Garza Garza*¹; Martha Guerrero Mata¹; Alejandro Lara Mendoza¹; Victor Páramo López²; ¹FIME, UANL; ²Frisa Forjados

11:10 AM

Influence of Silicon Content in Hot Metal on Mineralogical Characterization and Physico-chemical Properties of Vanadium Slag: Chongyang Zhao¹; *Bing Xie*¹; Xiaopeng Zhen¹; Qingyun Huang¹; Xie Zhang¹; ¹Chongqing University

11:25 AM

A Model of Decarburization and Boil of Iron/Carbon Droplets: *Mark Schwarz*¹; ¹CSIRO

11:40 AM

Analysis of Influence Factors on the Melting Point of the Freeze Slag Inside Flash Smelting Furnace Brickless Reaction Shaft: *Jinliang Wang*¹; Chuanfu Zhang²; ¹Jiangxi University of Science and Technology; ²Central South University

Advances in Surface Engineering: Alloyed and Composite Coatings: Session III

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee

Program Organizers: Sandip Harimkar, Oklahoma State University; Srinivasa Bakshi, Indian Institute of Technology Madras; Arvind Agarwal, Florida International University

Tuesday AM
March 13, 2012

Room: Macaw 1
Location: Swan Resort

Session Chair: To Be Announced

8:30 AM Introductory Comments

8:35 AM Invited

Chromium Nitride Coatings for Biological Applications: Aracely Rocha¹; Liangxian Chen²; Chengming Li²; *Hong Liang*¹; ¹Texas A&M University; ²University of Science and Technology Beijing

9:00 AM Invited

Development and Characterization of Aluminum Matrix in-situ Aluminum Di-borides Composites Coatings for Tribological Applications: *Sudeep Ingole*¹; Rajeshwari Paluri¹; ¹Texas A&M University

9:25 AM

A Nanoindentation Study of Laser Deposited Nickel-Based Carbide Metal Matrix Composite Coating: *Samar Kalita*¹; ¹Advanced Engineered Materials Center - University of North Dakota

TUESDAY AM

9:45 AM

In-Situ Synthesis of TiC/SiC/Ti₃SiC₂ Composite Coatings by Spark Plasma Sintering: *Ashish Singh*¹; Sandip Harimkar¹; Arvind Agarwal²; Srinivasa Bakshi³; David Virzi²; Anup Keshri²; ¹Oklahoma State University; ²Florida International University; ³IIT Madras

10:05 AM Break

10:20 AM

Microstructure and Wear Properties of Laser In-situ Formation of TiB₂ and TiC Titanium Composite Coatings: *J. Liang*¹; C S Liu²; S Y Chen²; C X Ren²; ¹Northeastern University; ²Northeastern University

10:40 AM

Surface Engineered CVD Diamond Coatings for Dry Machining Applications: *Humberto Gomez*¹; Delcie Durham²; Kevin Chou³; Xingcheng Xiao⁴; Michael Lukitsch⁴; Ashok Kumar²; ¹Universidad del Norte; ²University of South Florida; ³The University of Alabama; ⁴General Motors R&D Tech. Center

11:00 AM

Creep Properties of Y-PSZ Coated 6063 Aluminum Alloy: Eray Erzi¹; Cem Kahraman¹; *Suat Yilmaz*¹; ¹Istanbul University

11:20 AM

Effect of Pre-Oxidation Treatments on the Mechanical Properties of (Ni,Pt)Al Systems Measured by Nanoindentation: *Juan Avarado-Orozco*¹; Alma Mora-García²; Haide Ruiz-Luna; Haide Ruiz-Luna²; Luis Alberto Cáceres-Díaz²; John García-Herrera²; Juan Muñoz-Saldaña²; Jose Ortiz-Merino²; Gerardo Trapaga-Martinez²; Ricardo Morales-Estrella²; Doug Konitzer²; Enrique Samaniego-Benitez²; ¹Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional; ²Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional

11:40 AM

Contribution of Ti Addition to the Electronic Structure and Adhesion at the Fe₂Al₅/Fe Interface in 55%Al-Zn Coating: *Guangxin Wu*¹; Yuling Ren¹; Jieyu Zhang¹; Kuochih Chou¹; ¹Shanghai University

Alumina and Bauxite: Red Mud Bauxite Residue

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Benny Raahauge, FLSmidth

Tuesday AM
March 13, 2012

Room: Northern E3
Location: Dolphin Resort

Session Chair: Tim Laros, FLSmidth Salt Lake City

8:30 AM

Bauxite Residue Management: *Ken Evans*¹; Eirik Nordheim²; Katy Tsesmelis³; ¹Rio Tinto Alcan; ²European Aluminium Association; ³International Aluminium Institute

8:50 AM

Tests with New Flocculant for Red Mud Decanting in Alunorte: *Tatiani Santos*¹; Juracy Filho¹; Américo Borges¹; Humberto Lima¹; Juarez Borges¹; Frederico Giust²; Alexandre Rabaça²; ¹Alunorte SA; ²SNF do Brasil

9:10 AM

Red Mud Filtration Test Results using AFP IV™ Automatic Filter Press: *Manfred Bach*¹; ¹FLSmidth

9:30 AM

Study on Dry –Method Volume Expansion Technology for Wet Red Mud Yard: *Li Mingyang*¹; Xu Shutao¹; Yi Xiaobing²; ¹CHALIECO; ²CHALIECO

9:50 AM

ETI Aluminum Red Mud Characterization and Processing: Gokhan Demir¹; *Sedat Arslan*¹; Bekir Celikel¹; Meral Baygul¹; Carlos Enrique Suarez²; ¹ETI Aluminium; ²Hatch Associates Consultant Inc.

10:10 AM

Studies on Metal Flow from Khondalite to Bauxite to Alumina and Rejects from an Alumina Refinery, India: *Birendra Mohapatra*¹; Barada Mishra¹; Chittaranjan Mishra²; ¹Institute of Minerals & Materials Technology(IMMT); ²Other

10:30 AM

Directions for Large Scale Utilization of Bauxite Residue: *Andrey Panov*¹; Gennady Klimentenok²; Gennadiy Podgorodetskiy³; Vladislav Gorbunov³; ¹RUSAL Vami; ²RUSAL Engineering & Technology Centre; ³National University of Science and Technology “MISIS”

10:50 AM

Production of Pig Iron from NALCO Redmud by Application of Plasma Smelting Technology: *Partha Mukerjee*¹; Bhagyadhar Bhoi¹; Chittaranjan Mishra²; Ramani Dash³; Bijay Satapathy²; Kalidas Jayasankar¹; ¹Institute of Minerals & Materials Technology(IMMT); ²National Aluminium Company Limited; ³Gandhi Institute of Engineering & Technology(GIET)

Aluminium Processing: General

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Processing Committee
Program Organizers: Kai Karhausen, Hydro Aluminium Rolled Products GmbH; Edward Williams, Alcoa

Tuesday AM
March 13, 2012

Room: Europe 1
Location: Dolphin Resort

Session Chairs: Kai Karhausen, Hydro Aluminium Rolled Products; Edward Williams, Alcoa

8:30 AM Introductory Comments

8:35 AM

Finite Element Simulation Analysis of the Ultrasonic Vibration Forging of an Aluminum Cylinder Workpiece: *Yanxiang Liu*¹; Qingyou Han¹; ¹Purdue University

8:55 AM

Refinement of Fe-Intermetallic Compounds by Caliber Rolling Process of Al-Mg-Si-Fe Alloys: *Chakkrist Phongphisutthinan*¹; Hiroyasu Tezuka¹; Tatsuo Sato¹; Susumu Takamori²; Yoshiaki Ohsawa²; ¹Tokyo Institute of Technology; ²National Institute for Materials Science

9:15 AM

Analytical and FEM Modeling of Aluminum Billet Induction Heating with Experimental Verification: *Mark Kennedy*¹; Shahid Akhtar²; Jon Arne Bakken²; Ragnhild Aune²; ¹Norwegian University of Science and Technology; ²Norwegian University of Science and Technology

9:35 AM Question and Answer Period

9:45 AM Break

10:15 AM

The Evolution of Mechanical Properties and Microstructure in Early Stages of Natural Ageing on 2024 Plates: Gheorghe Dobra¹; *Ioan Sava*¹; Cristian Stanescu¹; Marin Petre¹; ¹ALRO

TUESDAY AM



TMS 2012

141st Annual Meeting & Exhibition

TUESDAY AM

10:35 AM

Formation of Intermetallic Compound on the Interface of Copper/Aluminum Clad Sheet Produced by Asymmetrical Roll Bonding and Annealing: *Xiaobing Li¹*; Guoyin Zu²; Ping Wang³; Rong Xu⁴; ¹School of Materials and Metallurgy, Northeastern University; ²School of Materials and Metallurgy, Northeastern University; ³Key Laboratory of Electromagnetic Processing of Materials, Ministry of Education, Northeastern University; ⁴The State Key Laboratory of Rolling and Automation, Northeastern University

10:40 AM Question and Answer Period

Aluminum Alloys: Fabrication, Characterization and Applications: Thermal Mechanical Processing

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Processing Committee
Program Organizers: Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum

Tuesday AM

March 13, 2012

Room: Northern E1

Location: Dolphin Resort

Session Chair: Xiyu Wen, University of Kentucky

8:30 AM

Modeling of As-Cast A356 for Coupled Explicit Finite Element Analysis: *Matthew Roy¹*; Daan Maijer¹; ¹The University of British Columbia

8:50 AM

Textures, Particle Structures and Mn Solution in Al Matrix of a Continuous Cast AA3004 Aluminum Alloy after Cold Rolling and Annealing: *Xiyu Wen¹*; Yansheng Liu²; Jingwu Zhang³; Shridas Ningileri²; Tongguang Zhai¹; ¹University of KY; ²Secat Inc.; ³State Key Laboratory of Metastable Materials Science and Technology

9:10 AM

Observation of Structure Evolution during Annealing of 7xxx Series Al Deformed at High Temperature: *Cory Parker¹*; *David Field¹*; ¹Washington State University

9:30 AM

Study of Homogenization Treatments of DC Cast 5xxx Series Al-Mg-Mn Alloy Modified with Zn: *Akram Halep¹*; *Tamara Radetic¹*; Miljana Popovic¹; Endre Romhanji¹; ¹Department of Metallurgical Engineering, Faculty of Technology & Metallurgy, University of Belgrade, Belgrade, Serbia

9:50 AM

Microstructure Evolution of 7003 Aluminum Alloy by Equal Channel Angular Extrusion Process: *Qingnan Shi¹*; *Gang Yang¹*; Liangwei Chen¹; Xiaoqi Wang¹; Zaochua Liu¹; ¹Kunming University of Science and Technology, School of Materials Science and Engineering

10:10 AM

Steel-Aluminium Composite Castings for High-Performance Die Cooling Applications: *Heiner Michels¹*; Andreas Bührig-Polaczek¹; David Becker²; ¹RWTH Aachen, Foundry Institute; ²Fraunhofer Institut für Lasertechnik

10:30 AM Break

10:45 AM

High Strength Al-Mg-Mn Alloy Sheets Fabricated by Twin Roll Casting: *Hyoung-Wook Kim¹*; Suk-Bong Kang¹; Jae-Hyung Cho¹; ¹Korea Institute of Materials Science

11:05 AM

Increasing Mechanical Properties of AA 6082 by Optimizing Chemical Compositions and processing Parameters during Extrusion: Milan Tercelj¹; *Matevz Fazarinc¹*; Goran Kugler¹; Iztok Perus¹; ¹University of Ljubljana

11:25 AM

Investigation of the Porosity Evolution during Hot-Compression Tests on an Aluminum Alloy: *Agouti Siham¹*; Bouchard Pierre-Olivier²; Piellard Mickael³; Le Brun Pierre⁴; Bozzolo Nathalie²; ¹Centre of materials forming; ²Centre of Materials Forming; ³Aubert & Duval; ⁴Constellium CRV

11:45 AM

Effect of Strain Rate on the Microstructural Development in DC Cast Al-15Si Alloy: *Chunxia Wang¹*; Fuxiao Yu¹; Dazhi Zhao¹; Xiang Zhao¹; Liang Zuo¹; ¹Northeastern University, China

12:05 PM

Influence of High-Pressure Torsion on Mechanical Properties and Microstructural Evolution in 2197 Al-Li Alloy: *Yuan Yuan¹*; Huimin Lu¹; Xuguang Li¹; ¹Beihang University

Aluminum Reduction Technology: Energy Saving

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Olivier Martin, Rio Tinto Alcan

Tuesday AM

March 13, 2012

Room: Southern III

Location: Dolphin Resort

Session Chair: Martin Segatz, Hydro Aluminium Deutschland

8:30 AM

Research and Application of Energy Saving Technology for Aluminum Reduction in China: *Feng Naixiang¹*; Peng Jianping¹; Wang Yaowu¹; Di Yuezhong¹; ¹Northeastern University

8:50 AM

Low Energy Cell Development on AP Technology™: *Olivier Martin¹*; Bertrand Allano¹; Etienne Barrioz¹; Aurore Escande¹; Yves Caratini¹; Nolwenn Favell¹; ¹Rio Tinto Alcan

9:10 AM

Review on the Energy Saving Technologies Applied in Chinese Aluminum Reduction Industry: *Fengqin Liu¹*; Songqing Gu¹; ¹Chalco

9:30 AM

Numerical Simulation on Coupled Multi-field of the Perforated Anode in Aluminium Reduction Cells under Low Carbon Operation: *Hesong Li¹*; Xi Cao¹; Yingfu Tian²; ¹Central South University, China; ²Chongqing Tiantai Aluminum Industry Co.Ltd

9:50 AM

Improved Energy Management during Anode Setting Activity: *Ali Jassim¹*; Gregory Meintjes¹; Arvind Kumar¹; Jose Blasques¹; Mohammed Sadiq¹; Maryam Al-Jallaf¹; Ali Al Zarouni¹; ¹Dubai

10:10 AM Break

10:20 AM

The Transition Strategy at Alouette towards Higher Productivity with a Lower Energy Consumption: *Pascal Coursol¹*; Jules Côté¹; Francois Laflamme¹; Pascal Thibault²; Alexandre Blais²; Dany Lavoie¹; Serge Gosselin¹; ¹Aluminerie Alouette; ²Rio Tinto Alcan

10:40 AM

Experimental Studies of the Impact of Anode Pre-Heating: Otavio Fortini¹; *Srinivas Garimella*¹; Edwin Kunn¹; Yimin Ruan¹; Benyam Yacob¹; Jack Sorensen¹; ¹Alcoa

11:00 AM

Depth Analysis and Potentiality Exploitation on Energy-Saving and Consumption-Reduction of Aluminum Reduction Pot: Jianfei Zhou¹; *Marc Dupuis*²; Jun Huang¹; Xiaobing Yi¹; Feiya Yan¹; ¹Guiyang Aluminum Magnesium Design & Research Institute; ²GéniSim Inc

11:20 AM

Development and Application of SAMI's Low Voltage Energy-Saving Technology: *Dongfang Zhou*¹; Xiaodong Yang¹; Wei Liu¹; ¹Shenyang Aluminium & Magnesium Engineering & Research Institute Co. Ltd

11:40 AM

Twin Air Compressor for Energy Saving and Backup Capability: Anne-Gaëlle Hequet¹; *Serge Despinasse*¹; ¹ECL

Atomistic Effects in Migrating Interphase Interfaces - Recent Progress and Future Study: Kinetics of Phase Transformations in Ferrous Alloys

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee
Program Organizers: Tadashi Furuhashi, Institute for Materials Research, Tohoku University; Sudarsanam Babu, Ohio State University; Hatem Zurob, McMaster University; Jian-Feng Nie, Monash University; Wen-Zheng Zhang, Tsinghua University; James Howe, University of Virginia

Tuesday AM
March 13, 2012

Room: Europe 3
Location: Dolphin Resort

Session Chairs: Christopher Hutchinson, Monash University; Sudarsanam Babu, Ohio State University

8:30 AM Invited

The Role of Interfaces in the Development of Microstructure in Bainitic Steels: *Gary Purdy*¹; R. Hadian¹; G. Botton¹; ¹McMaster University

9:00 AM Invited

A Study on the Kinetics of Bainite in Steel: *Annika Borgenstam*¹; ¹KTH

9:30 AM Invited

The Effect of Alloy Composition on the Stagnant Phase during the Austenite-Ferrite Transformation: *Sybrand Van Der Zwaag*¹; Hao Chen¹; ¹Technical University Delft

10:00 AM

A Model for Calculating C-curves for Widmanstätten and Bainitic Ferrite: *Peter Kolmskog*¹; Annika Borgenstam¹; ¹Royal Institute of Technology, KTH

10:20 AM Break

10:35 AM

Alloying Element Partitioning and Phase Transformations during Rapid Heating and Cooling: Tapasvi Lolla¹; Brian Hanhold¹; Gary Cola²; *Sudarsanam Babu*¹; ¹Ohio State University; ²Sirius Protection, LLC

10:55 AM Invited

Austenite Stabilization through the Quench and Partition Process: *Amy Clarke*¹; John Speer²; Robert Hackenberg¹; Emmanuel De Moor²; ¹Los Alamos National Laboratory; ²Colorado School of Mines

11:25 AM

Partitioning of Carbon into Austenite Matrix during Bainite Transformation: *Naoki Takayama*¹; Goro Miyamoto¹; Tadashi Furuhashi¹; ¹Tohoku University

Biological Materials Science Symposium: Biological and Bio-Inspired Materials I: Hard Biomaterials

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Nima Rahbar, University of Massachusetts Dartmouth; Candan Tamerler, University of Washington; Po-Yu Chen, University of California, San Diego; Molly Gentleman, Texas A&M University

Tuesday AM

March 13, 2012

Room: Swan 7

Location: Swan Resort

Session Chairs: Ryan Roeder, University of Notre Dame; Candan Tamerler, University of Washington

8:30 AM Keynote

Peptide-Tailored Solid Interfaces: From Biocompatibility to Self-assembly and Biomaterialization: *Mehmet Sarikaya*¹; ¹University of Washington

9:10 AM

Design of Bone-Mimetic Scaffolds: *Ryan Roeder*¹; Timothy Conrad¹; Robert Kane¹; ¹University of Notre Dame

9:30 AM

Mechanical Behavior of a Cellulose-Based Scaffold in Vascular Tissue Engineering: *Parisa Pooyan*¹; Rina Tannenbaum¹; Hamid Garmestani¹; ¹Georgia Institute of Technology

9:45 AM

Sheep Hydroxyapatite (SHA)- Commercial Inert Glass (CIG) Composites: *Nermin Demirkol*¹; Faik Oktar²; Eyup Kayali³; ¹Kocaeli University; ²Marmara University; ³Istanbul Technical University

10:00 AM Break

10:10 AM Invited

Mineralization of Dense Collagen Scaffolds Using a Polymer-Induced Liquid-Precursor (PILP) Process: Yuping Li¹; Taili Thula²; *Laurie Gower*²; ¹University of Minnesota; ²University of Florida

10:40 AM

Assessing Biocompatibility and Mechanical Properties of Degradable Metallic Biomaterials: *Puneet Gill*¹; Norman Munroe¹; Amit Datye²; Rupak Dua¹; Sharan Ramaswamy¹; ¹Florida International University; ²University of Tennessee Knoxville

11:00 AM

Anisotropic Behavior and Phase Transformation in Bone: *Ahmet Ucisk*¹; Mehmet Aksoy²; Isil Kutbay³; Metin Usta³; Cuma Bindal⁴; ¹Bogazici University; ²Ministry of Health Istanbul Division; ³Gezbe Institute of Technology; ⁴Sakarya University

11:20 AM

Fatigue Behavior of Ti-6Al-4V for Medical Applications after Surface Modification by Anodization: Fernanda Potomati¹; Laís Possato¹; Enrico Giordano¹; *Claudemiro Bolfarini*¹; ¹Universidade Federal de São Carlos

11:40 AM

Morphological Evaluation of Osteoblast-TiO₂ Nanotube Interfaces: *Tolou Shokuhfar*¹; Chang Choi¹; Craig Friedrich¹; ¹Michigan Technological University

TUESDAY AM



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Bulk Metallic Glasses IX: Structures and Mechanical Properties I

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

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

Tuesday AM Room: Swan 6
March 13, 2012 Location: Swan Resort

Session Chairs: Takeshi Egami, University of Tennessee; Katharine Flores, The Ohio State University

8:30 AM Keynote

Atomic Level Flow Dynamics in Metallic Glasses: *Takeshi Egami*¹; Takuya Iwashita¹; ¹University of Tennessee

9:00 AM

Nucleation Reactions during Deformation and Crystallization of Metallic Glass: *Seth Imhoff*¹; John Perepezko¹; Mingwei Chen²; Sergio Gonzalez³; Akihisa Inoue²; ¹University of Wisconsin-Madison; ²Tohoku University; ³Universitat Autònoma de Barcelona

9:10 AM Invited

High Energy X-Ray Scattering Studies of Plastic Process Zones around Fatigue Crack Tips in Metallic Glasses: *Todd Hufnagel*¹; Uday Vempati¹; Jon Almer²; ¹Johns Hopkins University; ²Argonne National Laboratory

9:30 AM Invited

Irreversible Lattice Deformation and Enhanced Fragility Under Fatigue in Amorphous Solids: *Despina Louca*¹; Peng Tong¹; Gongyao Wang²; Peter Liaw²; Yoshihiko Yokoyama³; Anna Llobet⁴; Yiming Qiu⁵; Yunfeng Shi⁶; ¹University of Virginia; ²University of Tennessee; ³Tohoku University; ⁴Los Alamos National Laboratory; ⁵NIST Center for Neutron Research; ⁶Rensselaer Polytechnic Institute

9:50 AM Break

10:05 AM Invited

Structure and Dynamics of a Metallic Glass during Mechanical Deformation: *Wojciech Dmowski*¹; Takuya Iwashita¹; Konstantin Lokshin¹; Yoshiko Yokoyama¹; Chin-Pi Chuang¹; Matthew Stone¹; Takeshi Egami¹; ¹University of Tennessee

10:25 AM Invited

Investigation of Microstructure and Property Variations in Metallic Glass Matrix Composites: Nicholas Hutchinson¹; Anupriya Agrawal¹; Wolfgang Windl¹; *Katharine Flores*¹; ¹The Ohio State University

10:45 AM Invited

Origins of Tensile Ductility and Work-Hardening in TRIP CuZr-Based Bulk Metallic Glass Composites: Y. Wu¹; D. Ma²; A. D. Stoica²; Z. Y. Zhang¹; W. L. Song¹; G. Y. Wang³; G. M. Stoica²; X. L. Wang²; K. An²; *Z. P. Lu*¹; ¹University of Science and Technology Beijing; ²Oak Ridge National Laboratory; ³University of Tennessee

11:05 AM

Short and Medium Range Order in Ca-Mg-Cu Amorphous Alloys: *Oleg Senkov*¹; Yongqiang Cheng²; Daniel Miracle¹; Evan Ma²; Emma Barney³; Alex Hannon³; ¹Air Force Research Laboratory; ²John Hopkins University; ³ISIS Facility, Rutherford Appleton Laboratory

11:15 AM Invited

Neutron and X-Ray Diffraction Studies of Crystallization in Bulk Amorphous Alloys: *Dong Ma*¹; Alexandru Stoica¹; X.-L. Wang¹; ¹ORNL

11:35 AM

Structural Anisotropy of BMGs after Mechanical Deformation: *Yang Tong*¹; Zbigniew Witczak²; Chin-Pin Chuang¹; Takeshi Egami³; Wojciech Dmowski¹; ¹University of Tennessee; ²Inst. High Pressure Phys.; ³ORNL

11:45 AM Invited

In Situ High Temperature X-Ray Diffraction Studies on Bulk Metallic Glasses: *Norbert Mattern*¹; ¹IFW Dresden

12:05 PM

Mechanical Behavior of Zr/Hf Based Bulk Metallic Glasses under Uniaxial Quasi-Static and Dynamic Compression: *Weihua Yin*¹; Laszlo Kecskes²; Qiuming Wei¹; ¹UNC Charlotte; ²WMRD, US ARL

Cast Shop for Aluminum Production: Grain Refinement and Castings

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee

Program Organizer: Trond Furu, Hydro

Tuesday AM Room: Northern A4
March 13, 2012 Location: Dolphin Resort

Session Chair: Per Arne Tøndel, Alcoa GPP Europe

8:30 AM

Effect of Grain Refiner Amount on the Hot Tearing of 6xxx Alloys During DC Casting: *Muhammad Umar Chandia*¹; Arild Håkonsen²; John Hafsaås¹; ¹Hydro Aluminium; ²Hycast AS

8:50 AM

Grain Refining of Pure Aluminum: *Lucy Han*¹; Corey Vian²; Jie Song²; Zhiwei Liu²; Qingyou Han²; Clause Xu³; Lu Shao³; ¹West Lafayette Jr./Sr. High School; ²Purdue University; ³Hans Tech

9:10 AM

Study on the Microstructure Changes of Hypereutectic Aluminum Casting Alloy Using Ultrasonic Vibration Process: *Jie Song*¹; Qingyou Han¹; ¹Purdue University

9:30 AM

A Mathematical Model and Computer Simulations for Predicting the Response of Aluminum Casting Alloys to Heat Treatment: *Chang-Kai Wu*¹; Makhlof Makhlof¹; ¹Worcester Polytechnic Institute

9:50 AM Break

10:10 AM

Understanding and Improving Chemical Capability in the Casthouse: Kolbjørn Halse¹; Amanda Bowles¹; *Inge Johansen*¹; ¹Hydro Aluminium

10:30 AM

Effects of Water Content of Frozen Mold on Fluidity of Aluminum Alloy: *Naoki OMURA*¹; Shuji Tada¹; ¹National Institute of Advanced Industrial Science and Technology(AIST)

10:50 AM

Simulation Tools to Complement Cast House Design and Daily Operation: *Laszlo Tikasz*¹; Robert McCulloch¹; Scheale Duvah Pentiah¹; Robert Baxter¹; ¹Bechtel Canada Co.

11:10 AM

Formation of Microstructure in Al-Si Alloys under Ultrasonic Melt Treatment: *Liang Zhang*¹; Dmitry Eskin²; Alexis Miroux³; Laurens Katgerman¹; ¹Delft University of Technology; ²Brunel University; ³Materials Innovation Institute

11:30 AM Break

CFD Modeling and Simulation in Materials Processing: Modeling of Melting and Remelting Processes

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
Program Organizers: Laurentiu Nastac, The University of Alabama; Lifeng Zhang, Missouri University of Science and Technology; Brian Thomas, University of Illinois at Urbana-Champaign; Adrian Sabau, Oak Ridge National Lab ; Nagy El-Kaddah, The University of Alabama; Adam Powell, Metal Oxygen Separation Technologies, Inc.; Hervé Combeau, Institut Jean Lamour

Tuesday AM
March 13, 2012

Room: Asia 4
Location: Dolphin Resort

Session Chairs: Alain Jardy, Institut Jean Lamour; Laurentiu Nastac, The University of Alabama

8:30 AM Keynote

A Multiscale Transient Modeling Approach for Predicting the Solidification Structure in VAR Processed Alloy 718 Ingots: *Laurentiu Nastac*¹; ¹The University of Alabama

9:00 AM Invited

A Multiscale Model for the Simulation of V.A.R. Ingot Solidification: Mathieu Revil-Baudard¹; *Alain Jardy*²; Faustine Leclerc³; Miha Zaloznik²; Véronique Rebeyrolle³; Hervé Combeau²; ¹Institut Jean Lamour / Areva NP Cezus; ²Institut Jean Lamour; ³Areva NP Cezus

9:30 AM Invited

The Effect of Slag Cap Thickness on the Pool Depth in Electroslag Remelting: *Jeffrey Yanke*¹; Rodney Trice¹; Matthew Krane¹; ¹Purdue Center for Metal Casting Research, School of Materials Engineering, Purdue University

10:00 AM Invited

Mathematical Modeling of Fluid Dynamics and Vessel Vibration in the AOD Process: *Christian Wuppermann*¹; Antje Rückert¹; Herbert Pfeifer¹; Hans-Juergen Odenthal²; Erich Hovestädt²; ¹RWTH Aachen University; ²SMS Siemag AG

10:30 AM Break

10:50 AM

Solute Redistribution, Liquid/Solid Interface Instability, and Initial Transient Regions during the Unidirectional Solidification of Ti-6-4 and Ti-17 Alloys: *Laurentiu Nastac*¹; ¹The University of Alabama

11:10 AM

CFD Modeling of Splash in Molten Materials Processing Operations: *Mark Schwarz*¹; ¹CSIRO

11:30 AM

Numerical Analysis of Electromagnetic Field in an Electroslag Remelting Process with Three –Phases Electrodes: *Baokuan Li*¹; Fang Wang¹; Meilong Shan¹; Fumitaka Tsukihashi¹; ¹Northeastern University

11:50 AM

Influence of the Electric Current Frequency on the Electroslag Remelting Process: *Abdellah Kharicha*¹; ¹University of Leoben

Characterization of Minerals, Metals, and Materials: Characterization of Minerals and Ceramics

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jiann-Yang Hwang, Michigan Technological University; Sergio Montero, State University of North Rio De Janeiro; Chenguang Bai, Chongqing University; John Carpenter, US Department of Energy; Donato Firrao, Politecnico di Torino; Byoung-Gon Kim, Korea Institute of Geoscience & Mineral Resources; Mingdong Cai, Schlumberger

Tuesday AM
March 13, 2012

Room: Asia 2
Location: Dolphin Resort

Session Chairs: Doyle Fiona, University of California, Berkeley ; Chenguang Bai, Chongqing University

8:30 AM

A Novel Low-Energy Route for the Extraction of Copper And Cobalt Metals/Alloys from the Zambian Sulphide Concentrates: *Yotamu Hara*¹; Animesh Jha¹; ¹Leeds University

8:45 AM

Structural and Chemical Modification of Sulfide Mineral Surfaces by High-Power Nanosecond Pulses: *Igor Bunin*¹; Valentine Chanturiya¹; Alexey Kovalev¹; Irina Khabarova¹; Elizaveta Koporulina¹; ¹Research Institute of Comprehensive Exploitation of Mineral Resources RAS

9:00 AM

Characterization of Magnetic and Non-Magnetic Iron Oxide Nanoparticles Synthesized by Different Routes: Alyssa Maich¹; E. Yegan Erdem¹; *Fiona Doyle*¹; ¹University of California, Berkeley

9:15 AM

Characterization of Concentrate, Pellet and DRI Samples for Trace Elements: *Mingming Zhang*¹; ¹ArcelorMittal Global R&D

9:30 AM

Dielectric and Temperature-Rising Characteristics of Ore Fines Materials in Microwave Field: *Hongbo Zhu*¹; Linqing Dai¹; Jinhui Peng¹; Wei Liang¹; Zheng Wei¹; Zhenliang Weng¹; Qianxu Ye¹; Jian Chen¹; ¹Kunming University of Science and Technology

9:45 AM

Characterization on the Roughness of the Iron Ore Particles: *Xuwei Lv*¹; Xiaobo Huang¹; ¹Chongqing University, China

10:00 AM

Synthesis and Characterization of Al, Ag, Ti, Cu, and B Substituted Hydroxylapatite: *Celaletdin Ergun*¹; Thomas Webster²; Gurbuz Gunes¹; Abdurrahman Bahadir³; Huinan Liu⁴; Ibrahim Erden⁵; ¹Istanbul Technical University; ²Brown University; ³MSTU; ⁴University of California, Riverside; ⁵Yildiz Technical University

10:15 AM

Electric Resistivity of Fine Chromite Ore: Cheng Pan¹; Xuwei Lv¹; Chenguang Bai¹; Xuyang Liu¹; Donghai Li¹; ¹Chongqing University

10:30 AM

Reduction of Agglomerated Manganese Ores in Ferromanganese Production: *Thomas Brynjulfssen*¹; Merete Tangstad¹; ¹Norwegian University of Science and Technology

10:45 AM

Making Direct Reduced Iron from Millscale Containing Coal by Microwave Heating: *Linqing Dai*¹; Hongbo Zhu¹; Jinhui Peng¹; Jian Chen¹; Qianxu Ye¹; ¹Kunming University of Science and Technology



TMS 2012

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TUESDAY AM

11:00 AM

Ceramic Pigments with Spinel Structure Obtained by Low Temperature Methods: *Oscar Restrepo*¹; Edgar Chavarriaga¹; Leidy Jaramillo¹; ¹National University of Colombia

11:15 AM

Synthesis and Characterization of Jarosite-Type Compounds with Arsenic: Francisco Patiño¹; Iván Reyes¹; Mizraim Flores¹; *Miguel Pérez*¹; Martín Reyes¹; Julio Juárez¹; ¹Universidad Autónoma del Estado de Hidalgo

11:30 AM

Mechanical Characterization of Cellular Ceramic Materials: *Wilson Acchar*¹; Fernando Barcelos¹; Luis Pereira²; ¹Federal University of Rio Grande do Norte; ²Federal University of Rio de Janeiro

11:45 AM

Study of Attapulgite for Human Health: *Wilson Acchar*¹; Tulio Moura¹; Antonio Costa¹; Ledjane Barreto²; ¹Federal University of Rio Grande do Norte; ²Federal University of Sergipe

Computational Thermodynamics and Kinetics: Phase-Field Simulations in Alloys I

Sponsored by: The Minerals, Metals and Materials Society, 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, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Phase Transformations Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Zi-Kui Liu, The Pennsylvania State University; Mark Asta, University of California, Berkeley; James Warren, The National Institute of Standards and Technology; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yu Wang, Michigan Tech

Tuesday AM

March 13, 2012

Room: Asia 5

Location: Dolphin Resort

Session Chairs: Mikko Haataja, Princeton University; David Wu, IHPC

8:30 AM Invited

Phase-Field Modeling of Evolving Microstructures and Phase Transformations in Solid Oxide Fuel Cells: *Mikko Haataja*¹; ¹Princeton University

8:55 AM

Inertia Dominated Criticality in Martensites: Oguz Salman¹; *Alphonse FineP*¹; Lev Truskinovsky¹; ¹CNRS - Ecole Polytechnique; ²ONERA-CNRS

9:10 AM

Continuum-Level Simulation of a Displacement Reaction System Based on Computational Thermodynamics and Kinetics: *Hui-Chia Yu*¹; Chen Ling¹; Jishnu Bhattacharya¹; Anton Van der Ven¹; Katsuyo Thornton¹; ¹University of Michigan

9:25 AM

A Phase-Field Model for δ -Zirconium Hydride Formation in Single- and Polycrystalline Zirconium Alloys: *Tae Wook Heo*¹; Kimberly Colas¹; Arthur Motta¹; Long-Qing Chen¹; ¹The Pennsylvania State University

9:40 AM

Phase Field Modeling of Coherent Zirconium Hydrides Reorientation under Applied Load: *Lingfei Zhang*¹; Ludovic Thuinet¹; Alexandre Legris¹; Andrée Debacker¹; Antoine Ambard²; ¹UMET; ²EDF R&D

9:55 AM

Continuum Dislocation Dynamics: Comparison between Models: *Woosong Choi*¹; Yong Chen¹; Stefanos Papanikolaou¹; James Sethna¹; ¹Cornell University

10:10 AM Break

10:30 AM

An Accurate Scheme for Resolving Grain Boundaries in a Phase-Field Model of 3D Grain Coarsening: *David Wu*¹; Zhidong Leong¹; Dickson Thian¹; Carl Krill III²; ¹Institute of High Performance Computing; ²Ulm University

10:45 AM

Phase Field Approach to Stress-Induced Solid-Solid and Solid-Liquid Phase Transformations: *Valery Levitas*¹; ¹Iowa State University

11:00 AM

Topological Effects in Coarsening of Grain-Boundary-Engineered Microstructures: *Ming Tang*¹; Bryan Reed¹; Vasily Bulatov¹; James Belak¹; Thomas Lagrange¹; Joel Bernier¹; Mukul Kumar¹; ¹Lawrence Livermore National Laboratory

11:15 AM

3D Phase Field Simulation of Phase Coarsening in Binary Two Phase System: *Vishal Yadav*¹; Nele Moelans¹; ¹Katholieke Universiteit Leuven

11:30 AM

A Phase Field Crystal Study of Rapid Solidification and Solute Trapping in Binary Alloys: *Harith Humadi*¹; Jeff Hoyt¹; Nikolas Provatas¹; ¹McMaster University

11:45 AM

Enhancement of Field-Induced Strain Responses in Decomposed Two-Phase Nanodispersions: *Wei-Feng Rao*¹; Armen Khachatryan¹; ¹Rutgers University

Computational Thermodynamics and Kinetics: Thermodynamics

Sponsored by: The Minerals, Metals and Materials Society, 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, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Phase Transformations Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Zi-Kui Liu, The Pennsylvania State University; Mark Asta, University of California, Berkeley; James Warren, The National Institute of Standards and Technology; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yu Wang, Michigan Tech

Tuesday AM

March 13, 2012

Room: Australia 3

Location: Dolphin Resort

Session Chairs: Vidvuds Ozolins, UCLA; Joerg Neugebauer, MPIE

8:30 AM Invited

Fully Ab Initio Determination of Free Energies: Where Do We Stand?: *Jörg Neugebauer*¹; Fritz Körmann¹; Alexey Dick¹; Albert Glensk¹; Blazej Grabowski²; Tilmann Hickel¹; ¹Max-Planck-Institut für Eisenforschung GmbH; ²Lawrence Livermore National Lab

8:55 AM

Ab-Initio Discovery of Crystal Structures and Phase Diagrams: *Richard Hennig*¹; William Tipton¹; Clive Bealing¹; Kiran Mathew¹; ¹Cornell University

9:10 AM

Determinants of Thermal Stability in Nano-sized Binary Alloys: *C. C. Yang*¹; Y.-W. Mai¹; ¹The University of Sydney

9:25 AM

Fully Ab Initio Determination of Anharmonic Contributions by Efficient Sampling Strategies: *Albert Glensk*¹; Blazej Grabowski²; Tilmann Hickel¹; Jörg Neugebauer¹; ¹Max-Planck-Institut, Duesseldorf, Germany; ²Lawrence Livermore National Laboratory

9:40 AM

High-Throughput Ab-Initio Calculations of Topologically Close-Packed Phases in Transition-Metal Alloys: *Thomas Hammerschmidt*¹; Bernhard Seiser²; Ralf Drautz¹; David Pettifor²; ¹ICAMS, Ruhr-University Bochum; ²University of Oxford

9:55 AM Break

10:20 AM Invited

Thermodynamics of Unstable Structures: *Vidvuds Ozolins*¹; ¹UCLA

10:45 AM

Ab Initio Thermodynamics of the fcc-bcc Transition in Ca Including All Relevant Finite Temperature Excitation Mechanisms: *Blazej Grabowski*¹; Per Soderlind¹; Tilmann Hickel²; Jorg Neugebauer²; ¹Lawrence Livermore National Laboratory; ²Max-Planck-Institut für Eisenforschung

11:00 AM

Thermodynamic Modeling of Peirce-Smith Converter Slag at the Chagres Smelter, Chile: N Cardona¹; P.J. Mackey²; P. Coursol³; R. Parada⁴; R. Parra⁵; ¹Kingston Process Metallurgy; ²P.J.Mackey Technology Inc.; ³Coursol Consultants; ⁴Chagres Smelter; ⁵University of Concepción

11:15 AM

Micron-Scale Measurements of Heat Capacity by Time-Domain Thermoreflectance: Xuan Zheng¹; *Changdong Wei*²; David Cahill³; Ji-Cheng Zhao²; ¹Seagate Technology; ²The Ohio State University; ³University of Illinois – Urbana-Champaign

11:30 AM

Quantum Monte Carlo and Statistical Sampling Approach to Reference States for Thermodynamic and Kinetic Models: *D. M. Nicholson*¹; Randolph Hood²; P. R. C. Kent¹; Fernando Reboredo¹; Markus Eisenbach¹; ¹Oak Ridge National Laboratory; ²Lawrence Livermore National Laboratory

11:45 AM

Ab Initio Temperature-Dependent Lattice Dynamics for BCC Uranium: *Per Soderlind*¹; Blazej Grabowski¹; Lin Yang¹; Alexander Landa¹; ¹Lawrence Livermore National Laboratory

Defects and Properties of Cast Metals: Hot Tearing

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Mark Jolly, University of Birmingham; Brian Thomas, University of Illinois at Urbana-Champaign; Carl Reilly, University of British Columbia

Tuesday AM
March 13, 2012

Room: Oceanic 4
Location: Dolphin Resort

Session Chairs: Derya Dispinar, NTNU; Christoph Beckermann, University of Iowa

8:30 AM

Quantitative Characterization of Damage Evolution during the Solidification of Al Alloys Using Fast Synchrotron Tomography: *Peter D. Lee*¹; Chedtha Puncreobutr²; Thomas Connolly³; Richard W. Hamilton²; ¹The University of Manchester; ²Imperial College London; ³Diamond Light Source Ltd,

8:55 AM

The Importance of Solidification Structure with Respect to Hot Tearing during Continuous Casting of Steels: *Robert Pierer*¹; Wolfgang Rauter²; Christian Bernhard¹; ¹Chair of Metallurgy, Montanuniversitaet Leoben; ²voestalpine Stahl Donawitz GmbH & Co KG

9:20 AM

Hot Tearing Susceptibility in DC-Cast Aluminum Alloys: *Nasim Jamaly*¹; Andre Phillion¹; Steven Cockcroft¹; Jean-Marie Drezet²; ¹University of British Columbia; ²Ecole Polytechnique Federale de Lausanne

9:45 AM Break

10:10 AM

Solidification Phenomena during Casting of Stainless Steel/Cast Iron Composites: *Tim Lucey*¹; Mark Reid²; Michael Cortie¹; Paul Huggett³; Ken Moran⁴; Wing Yeung¹; Richard Wuhrer¹; ¹University of Technology, Sydney; ²University of Wollongong; ³Materials Solutions Pty. Ltd.; ⁴Moran Scientific Pty. Ltd

10:35 AM

Hot Tear Susceptibility of Al-Mg-Si Alloys with Varying Iron Contents: Lisa Sweet¹; *Mark Easton*¹; John Taylor¹; Cameron Davidson¹; Liming Lu¹; Malcolm Couper²; David StJohn³; ¹CAST etc; ²ARC CoE of Design in Light Metals; ³School of Engineering, The University of Queensland

11:00 AM

Rules to Prevent and Mitigate Hot Tearing in Al Based Casting Alloys: *Shimin Li*¹; Kumar Sadayappan²; Diran Apelian³; ¹Worcester Polytechnic Institute; ²CANMET- Materials Technology Laboratory; ³Worcester Polytechnic Institute

11:25 AM

The Analytical Model of Microsegregation for Solute Elements in Solidifying Mushy Zone of Steel: *Chao Xiao*¹; Jiongming Zhang¹; Yanzhao Luo¹; ¹University of Science and Technology Beijing

TUESDAY AM



TMS 2012

141st Annual Meeting & Exhibition

Deformation, Damage, and Fracture of Light Metals and Alloys: Session II

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Light Metals Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Qizhen Li, University of Nevada, Reno; Fuqian Yang, Univ. of Kentucky; Ke An, Oak Ridge National Laboratory

Tuesday AM
March 13, 2012

Room: Northern A2
Location: Dolphin Resort

Session Chair: Fuqian Yang, Univ. of Kentucky

8:30 AM Invited

Corrosion Damage of Deformed AZ31 Mg Alloy: *Guang-Ling Song*¹;
¹GM Global Research & Development

9:00 AM Invited

Relationship of Corrosion Fatigue and Stress Corrosion Cracking Thresholds to Degree of Sensitization in Al-Mg Alloy: *Peter Pao*¹; Ronald Holtz¹; Thomas Longazel¹; Robert Bayles¹; Ramasis Goswami²;
¹Naval Research Laboratory; ²SAIC

9:30 AM

Fatigue and Corrosion Properties of Mg-Al-Mn Alloy by Super Vacuum Die Cast: *Wei Wen*¹; Alan A. Luo²; Tongguang Zhai¹; ¹University of Kentucky; ²General Motors Corporation

9:50 AM

Effect of Corrosion on the Strength of Fillet Arc Welded Cu-Lean AA7xxx Joints: *J. Dabrowski*¹; Dr. M. Bruhis¹; Dr. J.R. Kish¹; ¹Centre for Automotive Materials & Corrosion, McMaster University, Hamilton, ON Canada

10:10 AM Break

10:20 AM

Micro-Shear Stress and Damage Predictions from Hydrostatic Stress Loading of Aluminum Alloys 7075, 7039, and 7020: *John Chinella*¹;
¹U.S. Army Research Laboratory

10:40 AM

Coupling Experimentation and Computation to Investigate Damage Evolution in High Purity Aluminum: *Matthew Tucker*¹; John Bingert¹; Brian Patterson¹; Cheng Liu¹; Ricardo Lebensohn¹; ¹Los Alamos National Lab

11:00 AM

The Effect of Chemistry and Microstructure on the Deformation and Fracture Behavior of (Ti, Zr)Ni-Based Alloys with Aluminum Additions: *Derek Hsen Dai Hsu*¹; B. Chad Hornbuckle²; Gregory Thompson²; Michele Manuel¹; ¹University of Florida; ²The University of Alabama

11:20 AM

Investigation of Frequency Effect on Fretting Wear Damage of Titanium Alloy: Qualitative and Quantitative Approaches: *Benjamin van Peteghem*¹; Siegfried Fouvry¹; Patricia De Oliveira Campos Neubauer¹; ¹Laboratoire de Tribologie et Dynamique des Systèmes

11:40 AM

Primary Creep in Titanium Alloys: Role of Trace Elements: *Srikant Gollapudi*¹; Tapash Nandy¹; Satyanarayana D¹; Phaniraj C²; ¹Defence Metallurgical Research Laboratory; ²IGCAR

Electrode Technology for Aluminium Production: Bake Oven Design and Improvement

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Morten Sorlie, Alcoa Norway

Tuesday AM
March 13, 2012

Room: Americas Seminar
Location: Dolphin Resort

Session Chair: André Proulx, Rio Tinto Alcan

8:30 AM

Anode Quality and Bake Furnace Performance of EMAL: Raja Akhtar¹; *Markus Meier*²; Peter Sulger²; Werner Fischer²; Ralph Friedrich³; Thomas Janusch³; ¹Emirates Aluminium EMAL; ²R&D Carbon Ltd.; ³Riedhammer GmbH

8:55 AM

Experiences in FTC Design, Operation and Development: *Erik Dupon*¹; Peter Klut²; Edo Engel¹; ¹Danieli Corus Technical Services; ²Danieli Corus BV

9:20 AM

Boost of Anode Production at Voerdal Aluminium by Advanced and Integrated Control Strategies: Michael Schneider¹; Christian Krupp¹; *Detlef Maiwald*²; Domenico Di Lisa²; ¹Voerde Aluminium GmbH; ²Innovatherm

9:45 AM

New Central Control System Architecture for Anode Baking Furnaces: *Nicolas Fiori*¹; Xavier Genin¹; Fabienne Virieux²; ¹Solios Carbone; ²Fives Solios

10:10 AM Break

10:25 AM

Methods to Improve Fuel Utilization for Open Top Anode Baking Furnaces: Rifu Lin¹; Shoulei Gao¹; Lin Tang¹; Yan Li¹; ¹Sunstone

10:50 AM

Energy Saving Technologies for Anode Manufacturing: *Jingli Zhao*¹; Qingcai Zhao¹; ¹Jinan Aohai Carbon Products Corporation Ltd.

Electrometallurgy 2012: Session II

Sponsored by: The Minerals, Metals and Materials Society, The Metallurgy and Materials Society of CIM, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee

Program Organizers: Georges Houlachi, Hydro-Quebec; Antoine Allanore, Massachusetts Institute of Technology; Michael Free, University of Utah; Michael Moats, University of Utah; Edouard Asselin, UBC; Shijie Wang, Rio Tinto Kennecott Utah Copper; James Yurko, Materion Brush Beryllium and Composites

Tuesday AM
March 13, 2012

Room: Europe 5
Location: Dolphin Resort

Session Chairs: Georges Houlachi, Hydro-Quebec; Jim Yurko, Materion Brush Beryllium and Composites

8:30 AM

Molten Carbonates in the Energy Field, as Electrolytes, Composite Materials, Fuel Carriers or Reaction Media: *Michel Cassir*¹; ¹Chimie ParisTech

8:50 AM

The Equilibrium between Titanium Ions and Metal Titanium in Fluoride-Chloride: *Qiuyu Wang*¹; Hongmin Zhu¹; ¹University of Science and Technology Beijing

9:10 AM

Surface Area Effects at Liquid-Liquid Interfaces Consisting of a Liquid Metal and an Electrolyte: *Paul Burke*¹; Brice Chung¹; Brian Oldfield¹; Donald Sadoway¹; ¹MIT

9:30 AM

Electrochemical Behavior of Calcium-Bismuth Alloys in Molten Salt Electrolytes: *Hojong Kim*¹; Dane Boysen¹; Donald Sadoway¹; ¹MIT

9:50 AM

Low Temperature Extraction Process for Metals from Metal Oxides Using Ionic Liquids: *Vibha Gill*¹; Ramana Reddy¹; ¹The University of Alabama

10:10 AM Break

10:25 AM

Towards Sustainable Metals Production by Molten Oxide Electrolysis: *Donald Sadoway*¹; ¹MIT

10:45 AM

Effect of Electronic Current on the Solid Oxide Membrane (Som) Process for Magnesium Production: *Eric Gratz*¹; Soobhankar Pati²; Jarrod Milshtein¹; Adam Powell²; Uday Pal¹; ¹Boston University; ²Metal Oxygen Separation Technologies

11:05 AM

Behavior of Silicon Electrodepositing in Fluoride Molten Salts: *Xin Wang*¹; Shuqiang Jiao¹; Hongmin Zhu¹; ¹University of Science and Technology Beijing

11:25 AM

VITTORIO DE NORA PRIZE: Development of Electrometallurgical Processes for 21st Century Metal Extraction: *Antoine Allanore*¹; James Yurko¹; ¹Massachusetts Institute of Technology

Emeritus Professor George D.W. Smith Honorary Symposium: Steels I

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Michael Miller, Oak Ridge National Laboratory; Gregory Olson, Northwestern University and QuesTek Innovations LLC; George Krauss, Colorado School of Mines

Tuesday AM
March 13, 2012

Room: Mockingbird 2
Location: Swan Resort

Funding support provided by: Oak Ridge National Laboratory; QuesTek Innovations LLC; AMETEK, Inc

Session Chairs: George Krauss, Colorado School of Mines; Hans-Olof Andren, Chalmers University of Technology

8:30 AM Invited

Some Atoms I Have Known: A Tale of Two Smiths: *Greg Olson*¹; ¹Northwestern University

8:55 AM Invited

Microstructural Characterisation of Nanometre Scale Irradiation Damage in High-Ni Welds: *Jonathan Hyde*¹; Paul Styman²; Colin English¹; George Smith²; Keith Wilford³; Tim Williams³; Robin Boothby¹; Helen Thompson¹; ¹National Nuclear Laboratory; ²Oxford University; ³Rolls Royce

9:20 AM Invited

Contributions of Atom Probe Tomography to the Understanding of Steels: *Michael Miller*¹; ¹Oak Ridge National Laboratory

9:45 AM

Three Dimensional Characterization of Interfaces in Nanolayered Radiation Tolerant Metallic Thin Films: *Arun Devaraj*¹; Venkata Rama Sesha R Vemuri¹; Tamas Varga¹; Shutthanandan Vaithiyalingam¹; Satyanarayana V. N.T Kuchibhatla¹; Chongmin Wang¹; Thevuthasan Suntharampillai¹; Charles H Henager²; ¹EMSL, Pacific Northwest National Laboratory; ²Pacific Northwest National Lab

10:00 AM Break

10:30 AM Invited

Ultrahigh Strength Pearlitic Microstructures: Contributions by George D. W. Smith: *George Krauss*¹; Stephanie Miller¹; Emmanuel De Moor¹; David Matlock¹; ¹Colorado School of Mines

10:55 AM Invited

Atom Probe Analyses of Advanced Sheet Steels: *Kazuhiro Seto*¹; David Saxey²; George Smith³; ¹JFE Steel Corporation; ²University of West Australia; ³Oxford University

11:20 AM Invited

Atom Probe Tomography for Industrial Applications: *Harald Leitner*¹; ¹Montanuniversitaet Leoben

11:45 AM

The Application of Atom Probe Tomography to the Identification of Transformation Mechanisms of the Bainite Reaction in Steels: *Francisca Caballero*¹; Michael Miller²; Carlos Garcia-Mateo¹; Juan Cornide¹; ¹CENIM-CSIC; ²ORNL

12:00 PM

Atom Probe Analysis of Nanoscale Austenite Reversion in Steels: Dirk Ponge¹; *Dierk Raabe*¹; Lei Yuan¹; Pyuck Choi¹; Jim Wittig¹; ¹Max-Planck-Institut

12:15 PM

Control of p-n Heterojunction Abruptness in Vapor-liquid-solid Grown Semiconductor Nanowires: *Daniel Perea*¹; Jinkyong Yoo²; Daniel Schreiber¹; S. Tom Picraux²; Theva Thevuthasan¹; ¹Pacific Northwest National Laboratory; ²Los Alamos National Laboratory

Energy Nanomaterials: Photovoltaics I

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Reza Shahbazian-Yassar, Michigan Technological University; Ming Au, Savannah River National Laboratory; Meyya Meyyappan, NASA Ames Research Center

Tuesday AM
March 13, 2012

Room: Swan 3
Location: Swan Resort

Session Chairs: Reza Shahbazian Yassar, Michigan Technological University; Dhandapani Venkataraman, University of Massachusetts Amherst

8:30 AM Invited

Self-Assembly Strategies for Nanoscale Assemblies For Organic Photovoltaic Cells: *Dhandapani Venkataraman*¹; ¹University of Massachusetts Amherst



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9:00 AM

Atom Probe Contribution to the Characterization of Cigse Grain Boundaries: *Philippe Pareige*¹; Emmanuel Cadet¹; Francois Couzinie-Devy¹; Nicolas Barreau²; John Kessler²; ¹Rouen University; ²IMN

9:20 AM

Plasma Sprayed Titanium Oxide-Carbon Nanotube Composite Coating for Dye Sensitized Solar Cells: *Cheng Zhang*¹; Ujwal Chaudhary¹; Santanu Das¹; Samarth Thomas¹; Arvind Agarwal¹; ¹Florida International University

9:35 AM

Reaction Based Sintering and Applications for Dye Sensitized Solar Cells: *Sukanya Murali*¹; Dunbar Birnie¹; ¹Rutgers University

9:55 AM Break

10:25 AM Invited

First-Principles-Based Nanomaterials Design for Solar Energy Storage and Conversion: *Alexie Kolpak*¹; Jeffrey Grossman¹; ¹MIT

10:55 AM

Doped Titanium Oxide Nanotube Arrays with Enhanced Photocatalytic Properties: *Z. Xu*¹; *Q. Li*¹; *S. Gao*¹; *J. Shang*²; ¹Institute of Metal Research; ²University of Illinois

11:15 AM

New Numerical Method to Calculate the True Optical Absorption of Hydrogenated Nanocrystalline Silicon Thin Films and Solar Cells: *Fatiha Besahraoui*¹; ¹Oran University

Fatigue and Corrosion Damage in Metallic Materials: Fundamentals, Modeling and Prevention: Fatigue Life Prediction and Enhancement

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum; Peter Liaw, University of Tennessee

Tuesday AM
March 13, 2012

Room: Oceanic 6
Location: Dolphin Resort

Session Chairs: Richard Gangloff, University of Virginia; Nikhilesh Chawla, Arizona State University

8:30 AM Invited

Probabilistic Property-Life Mapping Based P-S-N Experiment Principle of Small Samples: *Liyang Xie*¹; Jianzhong Liu²; ¹Northeastern University, Shenyang, China; ²Beijing Aeronautic Materials Institute

8:50 AM

A Probabilistic Approach to Modeling Fatigue Life Variation: *Julian Raphael*¹; Peter Liaw²; Wei Wu²; ¹J R Technical Services, LLC; ²The University of Tennessee

9:10 AM

A Non-Linear Damage Accumulation Fatigue Model for Predicting Strain Life at Variable Amplitude Loadings Based on Constant Amplitude Strain Fatigue Data: *Peter Huffman*¹; Scott Beckman¹; ¹Iowa State University

9:30 AM

Fatigue Life Prediction of Friction Stir Welded Profiles: *Meysam Mahdavi Shahri*¹; Torsten Höglund¹; Rolf Sandström¹; ¹Royal Institute of Technology

9:50 AM

Neural Network Fatigue Life Prediction in Notched Bridge Steel I-Beams from Acoustic Emission Amplitude Data: *Eric Hill*¹; Fady Barsoum¹; Jamil Suleman¹; Andrej Korcak¹; Yi Zhang¹; ¹Embry-Riddle Aeronautical University

10:10 AM Break

10:20 AM

Effect of Laser Shock Peening (LSP) on the Fatigue Behavior of Ti-6Al-4V ELI Alloy: *Sagar Bhamare*¹; Sethuraman Subramanian¹; James Guenes¹; Leonora Felon²; David Kirschman²; Seetha Ramaiah Mannava¹; Dong Qian¹; Vijay K. Vasudevan¹; ¹University of Cincinnati; ²X-Spine Systems Inc.

10:40 AM

Fatigue Behavior of Laser Shock Peened (LSP) Ti6242 Alloy: *Gokulakrishnan Ramakrishnan*¹; Vibhor Chaswal¹; James Guenes¹; Kristina Langer²; Dong Qian¹; S.R. Mannava¹; Vijay.K. Vasudevan¹; ¹University of Cincinnati; ²Air Force Research Laboratory/RBSM, WPAFB

11:00 AM

Effect of Grinding Residual Stress on Fatigue Performance of Crankshaft: *Mahesh Dhumal*¹; Ramchandra Prasad²; Suresh Arangi¹; ¹Bharat Forge Limited; ²Department of MEMS, Indian Institute of Technology Bombay

11:20 AM

Effects of Ultrafast Laser Micromachining on Structure and Mechanical Properties of 316 LVM Stainless Steel: *Hossein Lavvafi*¹; John Lewandowski¹; Janet Gbur¹; Dave Dudzinski²; Melissa Young²; David Schwam¹; John J Lewandowski¹; ¹CWRU; ²Cleveland Clinic Foundation

11:40 AM

Fatigue Response of Aluminium Alloy 7075-T6 Bolted Plates at Flight Environmental Conditions: *Reza Hashemi Oskouei*¹; Raafat Ibrahim¹; John Mikhail¹; ¹Monash University

From Macro to Nano, Understanding Mechanical Behavior across Length Scales: A Structural Materials Division Symposium in Honor of Robert Ritchie: Amorphous and Nanocrystalline Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Biomaterials Committee

Program Organizers: Jamie Kruzic, Oregon State University; Brad Boyce, Sandia National Labs; Reinhold Dauskardt, Stanford University

Tuesday AM
March 13, 2012

Room: Mockingbird 1
Location: Swan Resort

Session Chairs: Brad Boyce, Sandia National Laboratory; Reinhold Dauskardt, Stanford University

8:30 AM Introductory Comments

8:35 AM Keynote

Fracture and Mechanical Behavior of Hybrid Molecular Glass Films: Experiments and Computational Models: *Reinhold Dauskardt*¹; ¹Stanford University

TUESDAY AM

9:15 AM Keynote

Microstructure and Stress State Effects on Fracture of Novel Materials: *John Lewandowski*¹; ¹Case Western Reserve Univ

9:55 AM

Thermography Study on the Temperature Evolution of Bulk Metallic Glasses under Monotonic and Cyclic Loading: *Peter Liaw*¹; Gongyao Wang¹; B. Yang²; Y. Yokoyama³; C. T. Liu⁴; A. Inoue³; ¹University of Tennessee; ²Shell Company; ³Tohoku University; ⁴City University of Hong Kong

10:10 AM

R-Curve Behavior of Zr-Ti-Cu-Al Bulk Metallic Glass with Extraordinary Fracture Toughness: *Jian Xu*¹; Qiang He¹; Evan Ma²; ¹Institute of Metal Research, Chinese Academy of Sciences; ²Department of Materials Science and Engineering, Johns Hopkins University

10:25 AM Break

10:40 AM

Fatigue-Induced Grain Growth as a Precursor to Crack Nucleation: *Brad Boyce*¹; Henry Padilla¹; ¹Sandia National Labs

10:55 AM

The Role of Free and Grain Boundary Surfaces in the Fatigue of Nanostructured Metals: *Christopher Muhlstein*¹; ¹The Pennsylvania State University

11:10 AM

The Mechanical Behavior of Highly Nano-Twinned Cu: *Andrea Hodge*¹; Timothy Furnish¹; Troy Barbee²; ¹University of Southern California; ²Lawrence Livermore National Laboratory

11:25 AM

Mechanical Properties of Nanotwinned and Nanolayered Metal Films: *Xinghang Zhang*¹; Yue Liu¹; Daniel Bufford¹; Haiyan Wang¹; ¹Texas A&M University

11:40 AM

A Comparative Study of the Mechanical Properties and Fracture of Nanocrystalline (20 nm), Ultrafine Grained (100 nm) and Coarse Grain Polycrystalline (> 1 µm) Ni: *Indranil Roy*¹; Farghalli Mohamed²; ¹Schlumberger; ²University of California, Irvine

Integrative Materials Design: Performance and Sustainability: Processing and Properties of Advanced Steels & Sustainable Design, Life-Cycle Analyses, and Recycling

Sponsored by: The Minerals, Metals and Materials Society, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizer: Diana A. Lados, Worcester Polytechnic Institute

Tuesday AM
March 13, 2012

Room: Europe 2
Location: Dolphin Resort

Session Chair: Diana Lados, Worcester Polytechnic Institute

8:30 AM Invited

Innovation in the Manufacturing of Powder Forged Automotive Connecting Rods: *Ian Donaldson*¹; ¹GKN Sinter Metals LLC

8:55 AM

New Concepts for Damage Tolerant Steels for High Performance Components: *Margarita Bambach*¹; Hans Henning Dickert¹; Wolfgang Bleck¹; ¹RWTH Aachen University

9:15 AM

Design of Novel Steels with Reduced Density: *Jonas Schwabe*¹; Wolfgang Bleck¹; Henning Dickert¹; Alexander Zimmermann¹; ¹RWTH Aachen

9:35 AM

Effect of Pretreatment on the Strength and Formability of Vehicle Hot-Forming Martensitic Steels: *Ying Chang*¹; Yipeng Gao²; Ping Hu¹; Liang Ying¹; Zhaohuan Meng¹; Yunzhi Wang²; ¹Dalian University of Technology; ²OSU

9:55 AM

The Contribution of Niobium Bearing Steels and Enhanced Sustainability: *Steven Jansto*¹; ¹CBMM-Reference Metals Company

10:15 AM Break

10:40 AM Invited

Resource Recovery and Recycling of Materials: Mini-Mills of the Future: *Diran Apelian*¹; ¹Worcester Polytechnic Institute

11:05 AM Invited

Engineering Solutions for Sustainability: Materials & Resources: *Brajendra Mishra*¹; ¹Colorado School of Mines

11:30 AM Invited

Limited Materials Availability: Considering the Importance of Materials Market Dynamics: *Randolph Kirchain*¹; Elisa Alonso¹; Frank Field¹; ¹Massachusetts Institute of Technology

11:50 AM Invited

Development of Aluminum Dross Based Material for Engineering Applications: *Chen Dai*¹; Diran Apelian; ¹WPI

12:10 PM Invited

Increasing Use of Secondary Materials in Production Planning: *Elsa Olivetti*¹; Randolph Kirchain¹; Gabrielle Gaustad²; ¹MIT; ²Rochester Institute of Technology, Rochester, NY

International Smelting Technology Symposium (Incorporating the 6th Advances in Sulfide Smelting Symposium): Current and Emerging Smelting Technologies

Sponsored by: The Minerals, Metals and Materials Society, The Metallurgy and Materials Society of CIM, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
Program Organizers: Jerome Downey, Montana Tech of the Univ of Montana; Thomas Battle, Midrex Technologies, Inc.; Jesse White, Elkem Solar Research

Tuesday AM
March 13, 2012

Room: Northern A3
Location: Dolphin Resort

Session Chair: To Be Announced

8:30 AM

The Path to Technology Development, Ralph Baggaley and the Evolution of Copper Smelting Technology: *Larry Southwick*¹; Ralph Yardley²; ¹L.M. Southwick & Associates; ²Yardley & Associates

8:55 AM

Processing of Lead, Zinc, Copper and Nickel Concentrates - The Xstrata Technology Approach: *Gerardo Alvear Flores*¹; ¹Xstrata Technology

9:20 AM

Ferroalloy Research in Norway – Cooperation between Academia and Industry: *Merete Tangstad*¹; ¹NTNU



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9:45 AM

Status of the Alcoa Carbothermic Aluminum Project: *Christina White*¹; Øyvind Mikkelsen¹; David Roha²; ¹Alcoa Norway ANS; ²Alcoa Technical Center

10:10 AM Break

10:25 AM

Outotec's Smelting Solutions in Non-Ferrous Metals Production: *Asmo Vartiainen*¹; ¹Outotec Oyj

10:50 AM

Atlantic Copper PS-Converters: A Continuous Commitment to the Future: *Antonio Martin*¹; Jesús Hurtado¹; Francisco Jimenez¹; ¹Atlantic Copper SA

11:15 AM

Improvements on Converter Operating Practice at Mfulira Smelter, Zambia: John Sakala¹; *Jeyapandian Sasikumar*¹; Sydney Kwalela¹; ¹Mopani

Magnetic Materials for Energy Applications II: Permanent Magnets for Energy Applications

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Raju Ramanujan, Nanyang Technological University; Francis Johnson, GE Global Research; S Guruswamy, Univ. of Utah; J Liu, Electron Energy Corporation

Tuesday AM

March 13, 2012

Room: Europe 10

Location: Dolphin Resort

Session Chairs: Raju Ramanujan, Nanyang Technological University; Jinfang Liu, Electron Energy Corporation

8:30 AM Introductory Comments

8:35 AM Invited

Novel Synthesis of Rare Earth Permanent Magnets for Energy Applications: *Raju Ramanujan*¹; P Deheri¹; S Bhame²; ¹Nanyang Technological University; ²Univ. of Liege

9:05 AM Invited

High Performance Magnets with Less or No Rare Earth: Challenges and Opportunities: *Jinfang Liu*¹; ¹Electron Energy Corporation

9:35 AM Invited

Synthesis and Characterization (Structural and Magnetic) of Bulk and Nanostructured d-Phase in Mn-Ga System: *Tanjore Jayaraman*¹; Jeffrey Shield¹; ¹University of Nebraska

10:05 AM Invited

Search for New Rare Earth Based Permanent Magnetic Materials: *B. Jensen*¹; K. Dennis¹; R. McCallum¹; ¹Ames Laboratory, US-DOE

10:35 AM Break

10:50 AM Invited

Interfacial Characterisation in Nd-Fe-B Permanent Magnets: *Thomas Woodcock*¹; Gino Hrkac²; Thomas Shreff³; Oliver Gutfleisch¹; ¹IFW Dresden; ²University of Sheffield; ³St. Pölten University of Applied Sciences

11:20 AM

Effect of Ni Content on the Crystallization Behavior and Magnetic Properties in a Nanocrystalline (Co_{1-x}Ni_x)₈₈Zr₇B₄Cu₁ Soft Magnetic Alloy: *Billy Hornbuckle*¹; Billie Wang¹; Taisuke Sasaki²; Maria Daniil³; Matt Willard⁴; Greg Thompson¹; ¹The University of Alabama; ²National Institute for Materials Science; ³Naval Research Laboratory; ⁴Naval Research Laboratory

11:35 AM

The Effect of Substituting Nb and Hf for Zr in Fe-Co-Ni-Zr-B-Cu Nanocrystalline Soft Magnetic Alloys: *Keith Knipling*¹; Maria Daniil¹; Matthew Willard¹; ¹Naval Research Laboratory

Materials and Fuels for the Current and Advanced Nuclear Reactors: Nuclear Fuels

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS/ASM: Nuclear Materials Committee

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Tuesday AM

March 13, 2012

Room: Swan 2

Location: Swan Resort

Session Chair: Dennis Keiser, Idaho National Laboratory

8:30 AM Invited

Compatibility of Metallic Transmutation Fuels with Fe-Based Alloys: *James Cole*¹; Thomas O'Holleran¹; Robert Mariani¹; Dennis Keiser¹; J. Kennedy¹; ¹Idaho National Laboratory

9:00 AM

Advanced Fuels with Fission Product Getters to Suppress Fuel-Cladding Chemical Interactions: *T. O'Holleran*¹; R. Mariani¹; Randall Fielding¹; P. Hansen¹; T. Hyde¹; J. Kennedy¹; ¹Idaho National Laboratory

9:20 AM

Reducing Fuel Cladding Chemical Interaction by Pinning Lanthanide Fission Products in Metallic Fuel: *Gerald Egeland*¹; Thomas Hartmann¹; Robert Mariani²; Rory Kennedy²; Steve Hayes²; ¹University Nevada Las Vegas; ²Idaho National Lab

9:40 AM

Nanofluid-Based Coatings to Mitigate Fuel Cladding Chemical Interactions (FCCI): *Vahid Firouzdor*¹; Lucas Wilson¹; Kumar Sridharan¹; Brandon Semerau¹; Benjamin Hauch¹; Todd Allen¹; ¹University of Wisconsin-Madison

10:00 AM

Microstructural and Chemical Characterization of High Burn-Up Mixed Oxide Fuel: *Melissa Teague*¹; Brian Gorman²; Steven Hayes¹; Jon Carmack¹; ¹Idaho National Laboratory; ²Colorado School of Mines

10:20 AM Break

10:30 AM

Interdiffusion Kinetics in U-Zr: *Vincenzo Lordi*¹; Mark Wall¹; Luke Hsiung¹; Ron Foreman¹; Patrice Turchi¹; ¹Lawrence Livermore National Lab

10:50 AM

Forming Process Development for Al-clad U-10Mo Monolithic Fuel Plates: *Kester Clarke*¹; David Alexander¹; Jill Wright²; Pavel Medvedev²; Richard Williamson²; ¹Los Alamos National Laboratory; ²Idaho National Laboratory

TUESDAY AM

11:10 AM

Characterization of Freeze-Cast Scaffolds as a Novel Fuel Form: *Clarissa Yablinsky*¹; Joan Burger²; Amanda Lang¹; Philipp Hunger²; Thomas Gage¹; Ulrike Wegst²; Todd Allen¹; ¹University of Wisconsin; ²Drexel University

11:30 AM

Transport Studies with Porous Metal Fuels: *Robert Mariani*¹; Curtis Clark¹; Thomas O'Holleran¹; Blair Park¹; Randall Fielding¹; J. Kennedy¹; ¹Idaho National Laboratory

11:50 AM

Production Scale-Up of Cylindrical Compact Fabrication: *Eric Shaber*¹; Jeffrey Phillips¹; ¹Battelle Energy Alliance/INL

Materials Design Approaches and Experiences III: High Strength High Toughness Steels

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Ji-Cheng Zhao, The Ohio State University; Akane Suzuki, GE Global Research; Deb Whitis, GE Aviation; Michael Fahrman, Haynes International Inc.; Qiang Feng, University of Science and Technology Beijing

Tuesday AM
March 13, 2012

Room: Europe 11
Location: Dolphin Resort

Session Chairs: J.-C. Zhao, The Ohio State University; Greg Olson, Northwestern University

8:30 AM Invited

Multi-Scale Modelling to Aid Alloy Design: *Matthias Militzer*¹; ¹The University of British Columbia

9:00 AM Invited

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

9:30 AM Invited

Multi-Scale Microstructure Design of High Performance Structural Steel: *Chengjia Shang*¹; ¹University of Science and Technology Beijing

10:00 AM Break

10:20 AM Invited

A Coupled Thermodynamics-Genetic Algorithm Approach For the Design of High Strength Stainless Steels: *Sybrand Van Der Zwaag*¹; Wei Xu¹; ¹Technical University Delft

10:50 AM

Material Design and Prediction of Deformation Response of Stainless Twinning Induced Plasticity Steels: *Linda Mosecker*¹; Alireza Saeed-Akbari¹; Wolfgang Bleck¹; ¹Department of Ferrous Metallurgy RWTH Aachen University

11:10 AM

Materials Design Over the Decades, How Far Have We Come?: *Charles Kuehmann*¹; Heng-Jeng Jou¹; Jason Sebastian¹; Chris Kern¹; ¹QuesTek Innovations LLC

11:30 AM

Formation and Morphology Control of TCP σ Phase in Austenitic Heat Resistant Steels: *Harumi Inatomi*¹; Masao Takeyama¹; ¹Tokyo Institute of Technology

11:50 AM

Changes of Work-Hardening-Rate in Advanced High Strength Austenitic Steels by the Applied Deformation and Material Parameters: *Alireza Saeed-Akbari*¹; Wolfgang Bleck¹; ¹RWTH Aachen University

Materials in Clean Power Systems VII: Clean Coal-, Hydrogen Based-Technologies, and Fuel Cells: Fuel Cells

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS: Energy Conversion and Storage Committee

Program Organizers: Xingbo Liu, West Virginia University; Teruhisa Horita, National Institute of Advanced Industrial Science and Technology; Jeffrey Hawk, National Energy Technology Lab; Jeffrey Fergus, Auburn University

Tuesday AM
March 13, 2012

Room: Europe 8
Location: Dolphin Resort

Session Chairs: Xingbo Liu, West Virginia University; Teruhisa Horita, National Institute of Advanced Industrial Science and Technology (AIST)

8:30 AM Invited

Fuel Flexibility and Microstructural Change in Anode during Operation of Solid Oxide Fuel Cells: *Koichi Eguchi*¹; Hiroki Muroyama¹; Toshiaki Matsui¹; ¹Kyoto University

9:00 AM

Study of Microstructure and Electrical Conductivity on (Ce_{0.9}Nd_{0.1})_{1-x}MxO_{2- Δ} Electrolytes for Intermediate-Temperature Solid Oxide Fuel Cells: *Fanzhi Meng*¹; N. Trubaki¹; Defeng Zhou²; Yanjie Xia³; Jian Meng³; ¹University of Toyama; ²Changchun Technology of University; ³Changchun Institute of Applied Chemistry, Chinese Academy of Sciences

9:20 AM Invited

Thermal Stability and Structural Evolution of LSM/YSZ Composite Cathode for SOFC by In-Situ Neutron Diffraction: *Ke An*¹; Ling Yang¹; Rebecca Mills¹; Lu Cai¹; ¹Oak Ridge National Laboratory

9:50 AM

Relationship between Cathode Performance and Impurity Concentration for Solid Oxide Fuel Cells: *Teruhisa Horita*¹; DoHyung Cho¹; FangFang Wang¹; Taro Shimonosono¹; Haruo Kishimoto¹; Katsuhiko Yamaji¹; Manuel Brito¹; Harumi Yokokawa¹; ¹AIST

10:10 AM Break

10:20 AM

Possibility of Metal Film Supported Electrolyte for Proton-SOFC: *Kenichi Kawamura*¹; Taku Kitahara¹; Shun Kawamura¹; Mitsutoshi Ueda¹; Toshio Maruyama¹; ¹Tokyo Institute of Technology

10:40 AM

Advanced Conductive Coating Performance at the Long-Term SOFC Operating Condition: *Jung Pyung Choi*¹; Jeffrey Stevenson¹; Scott Ryan¹; Matt Chou¹; Gordon Xia¹; ¹Pacific Northwest National Laboratory

11:00 AM

Transition Metal Doping of Manganese Cobalt Spinel Oxides for Coating SOFC Interconnects: *Jeffrey Fergus*¹; Yingjia Liu¹; Jason Ganley¹; Dileep Chakkathara Janardhanan Nair¹; William Tilson¹; Adam Dekich¹; ¹Auburn University

TUESDAY AM



TMS 2012

141st Annual Meeting & Exhibition

11:20 AM

The Effect of Cerium Oxide Nanoparticle Oxidation State on the Degradation Mitigation of 1100 EW Nafion® Composite Membranes: *Benjamin Pearman*¹; Nahid Mohajeri¹; Darlene Slattery¹; Len Bonville¹; Diego Diaz¹; Sudipta Seal²; Michael Hampton²; ¹Florida Solar Energy Center - UCF; ²University of Central Florida

11:40 AM

The Electrochemical Properties of TiAlCrN Coated Stainless Steel with PEMFC Environment: *Min-Seok Moon*¹; Kee-Do Woo²; Myung-Han Yoo³; Shin-Jae Kang⁴; Joon-Hyuk Song³; ¹Chonbuk National University, Jeonju Institute of Machinery Carbon Composites; ²Chonbuk National University; ³Jeonju Institute of Machinery and Carbon composites; ⁴Chonbuk National University, Jeonju Institute of Machinery and Carbon composite

Materials Processing Fundamentals: Application of Microwave, Magnet, Laser and Plasma Technology

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Process Technology and Modeling Committee
Program Organizers: Lifeng Zhang, Missouri University of Science and Technology; Antoine Allanore, MIT; Cong Wang, Saint-Gobain High Performance Materials

Tuesday AM
March 13, 2012

Room: Oceanic 8
Location: Dolphin Resort

Session Chairs: Cong Wang, Alcoa Technical Center; Antoine Allanore, MIT

8:30 AM

New Developments in Lorentz Force Velocimetry: *Andre Thess*¹; Yurii Kolesnikov¹; Christian Karcher¹; Rico Klein¹; Michael Gramss¹; Dandan Jian¹; Christiane Heinicke¹; André Wegfrass¹; Christian Resagk¹; Xiaodong Wang¹; Thomas Boeck¹; Thomas Froehlich¹; Falko Hilbrunner¹; Christian Diethold¹; Ilko Rahneberg¹; Michael Werner¹; Bernd Halbedel¹; ¹TU Ilmenau

8:55 AM

Non-Contact Measurements in Liquid Metal Free-Surface Flow Using Time-of-Flight Lorentz Force Velocimetry: *Dandan Jian*¹; Christian Karcher¹; ¹TU Ilmenau

9:20 AM

Microstructure and Mechanical Properties of Friction Stir Welding Zone in SS400(SPHC) Plate: *Kwang-jin Lee*¹; Sang-Hyuk Kim¹; Ik-Hyun Oh¹; Kee-Do Woo²; ¹Korea Institute of Industrial Technology; ²Chonbuk National University

9:45 AM

Modeling of Pulsed-Laser Superalloy Powder Deposition Using Moving Distributed Heat Source: *Manas Mahapatra*¹; Leijun Li²; ¹Indian Institute of Technology Roorkee; ²Utah State University

10:10 AM

Heat Transfer Characteristics of Magnetite under Microwave Irradiation: *Zhiwei Peng*¹; Jiann-Yang Hwang¹; Matthew Andriese¹; Zheng Zhang¹; Xiaodi Huang¹; ¹Michigan Technological University

10:35 AM Break

10:50 AM

Effect of Microwave Curing on GFRP Composites: *T Srinath*¹; P Martin Jebaraj¹; Rajaiah K¹; ¹Dr. Ambedkar Institute of Technology

11:15 AM

Experimental and Numerical Approach for Surface Finish during Laser Machining of Alumina: *Hitesh Vora*¹; Sameer Paital¹; Sandip Harimkar²; Sandra Boetcher¹; Narendra Dahotre¹; ¹University of North Texas; ²Oklahoma State University

11:40 AM

Refinement Effect of Pulse Magneto-Oscillation on Solidification Structure of Medium Carbon Steel: *Yufeng Cheng*¹; Zhengxin Yin¹; Xin Cao¹; Yongyong Gong¹; Renxing Li¹; Qijie Zhai¹; ¹Shanghai University

12:05 PM

Research on Solidification Structure Refinement of SUS430 Ferritic Stainless Steel by Electric Current Pulse: *Xin Cao*¹; Zhenxing Yin¹; Yufeng Cheng¹; Renxing Li¹; Yongyong Gong¹; Qijie Zhai¹; ¹Shanghai University

Materials Research in Microgravity: Session III

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
Program Organizers: Robert Hyers, University of Massachusetts; Hani Henein, University of Alberta; Valdis Bojarevics, University of Greenwich; James Downey, NASA; Douglas Matson, Tufts University; Achim Seidel, Astrium; Daniela Voss, ESA

Tuesday AM
March 13, 2012

Room: Asia 3
Location: Dolphin Resort

Session Chair: To Be Announced

8:30 AM Invited

Ground-Based Studies of the Structure and Properties of High Temperature Liquids for Upcoming ISS Experiments: *Ken Kelton*¹; ¹Washington University

9:05 AM Invited

Thermophysical Properties Measurement of High-Temperature Liquids under Microgravity Conditions in Controlled Atmospheric Conditions: *Masahito Watanabe*¹; Shumpei Ozawa²; Akitoshi Mizuno¹; Taketoshi Hibiya³; Hiroya Kawachi¹; Kentaro Murai¹; Suguru Takahashi²; ¹Gakushuin University; ²Tokyo Metropolitan University; ³Keio University

9:40 AM

Microgravity Research on Bulk Metallic Glasses and Composites: *Douglas Hofmann*¹; ¹NASA JPL/Caltech

10:05 AM Break

10:20 AM Invited

Detachment of Tertiary Dendrite Arms during Controlled Directional Solidification in Aluminum - 7 wt% Silicon Alloys: Observations from Ground-based and Microgravity Processed Samples: *Richard Grugel*¹; Robert Erdmann²; James Van Hoose³; Surendra Tewari⁴; David Poirier²; ¹Marshall Space Flight Center; ²University of Arizona; ³Qualis/Jacobs; ⁴Cleveland State University

10:55 AM

Microstructure Formations in the Two Phase Region of the Binary Peritectic Organic System TRIS-NPG: *Andreas Ludwig*¹; Johann Mogeritsch¹; ¹University of Leoben, Dep. Metallurgy

11:20 AM

Thermodynamics of Metal-Gas Eutectic Solidification and Potential Effects of Gravity on Microstructural Evolution: *Douglas Swenson*¹; Paul Sanders¹; Amber Lifer¹; Helen Ranck¹; ¹Michigan Technological University

TUESDAY AM

11:45 AM

Three-Dimensional Phase Field Modeling of Directional Solidification under Microgravity Conditions with Quantitative Experimental Comparison: *Damien Tournet*¹; Alain Karma¹; Rohit Trivedi²; Bernard Billia³; Nathalie Bergeon³; Jean-Marc Debierre³; Rahma Guerin³; ¹Northeastern University; ²Iowa State University; ³Institut Matériaux Microélectronique Nanosciences de Provence, UMR CNRS 6242

Mechanical Behavior at Nanoscale I: Deformation Mechanisms at Nanoscale

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Scott Mao, University of Pittsburgh; Julia R Greer, California Institute of Technology; Jianyu Huang, Center for Integrated Nanotechnologies; Marc Legros, CEMES-CNRS; Ting Zhu, Georgia Institute of Technology

Tuesday AM
March 13, 2012

Room: Asia 1
Location: Dolphin Resort

Session Chairs: Marc Legros, CEMES-CNRS; Jianyu Huang, Sandia National Lab

8:30 AM Invited

Shear Banding Mechanism in Nano-Twinned Cu–Al Alloy: C.S. Hong¹; N.R. Tao¹; X.X. Huang²; K. Lu¹; ¹Chinese Academy of Sciences; ²Riso National Lab

9:00 AM Invited

Stochastic Effects in Deformation and Fracture of Nanowires: Andreas Sedlmayr¹; Reiner Mönig¹; Steven Boles¹; Gunther Richter²; *Oliver Kraft*¹; ¹KIT; ²Max-Planck-Institut für Intelligente Systeme

9:30 AM

Plasticity in BCC Pillars Observed In-Situ by Laue Diffraction: *Helena Van Swygenhoven*¹; Julien Zimmermann¹; Cecile Marichal¹; Steven Van Petegem¹; ¹Paul Scherrer Institute

9:50 AM

Discrete Plastic Deformation in Gold Nanowires: *Scott Mao*¹; He Zheng¹; Christopher R. Weinberger²; Jianyu Huang²; ¹University of Pittsburgh; ²Sandia National Lab

10:10 AM Break

10:20 AM Invited

Deformation Mechanisms in Small Scale Al: An In-Situ TEM Study: *Frederic Mompou*¹; ¹CEMES-CNRS

10:50 AM Invited

Stochastic Behavior of Dislocation Nucleation in Solids with Defects: *David Bahr*¹; Yoonkap Kim¹; Christine Joseph¹; Benjamin Revard¹; Iman Salehinia¹; ¹Washington State University

11:20 AM

Nanovoid Generation and Growth in Metals: Dislocation Mechanisms: *Marc Meyers*¹; Yizhe Tang¹; Eduardo Bringa²; Bruce Remington³; ¹University of California, San Diego; ²Univ. Nac.Cuyo; ³Lawrence Livermore National Laboratory

11:40 AM

Deriving Deformation Mechanisms in Nanocrystalline AuCu Thin Films from *in situ* Synchrotron-Based XRD and SEM Tensile Tests: *Jochen Lohmiller*¹; Patric Gruber¹; Ralph Spolenak²; ¹Karlsruhe Institute of Technology; ²ETH Zurich

12:00 PM

Characterization of Deformation Mechanisms during Cold Rolling of Nanocrystalline Nickel: *Jorg Wieszorek*¹; Andreas Kulovits¹; ¹University of Pittsburgh

12:20 PM

Probing the Relation between Indentation Characteristics and Dislocation Substructure: Lin Li¹; Myoung-Gyu Lee²; *Peter Anderson*¹; ¹The Ohio State University; ²POSTECH

Mechanical Behavior Related to Interface Physics: Microscopic Characterization of Interface Mechanical Response

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Izabela Szlufarska, University of Wisconsin-Madison; Zhiwei Shan, Xi'an Jiaotong University

Tuesday AM
March 13, 2012

Room: Oceanic 1
Location: Dolphin Resort

Session Chairs: Andrew Minor, UC Berkeley & LBL; Scott Mao, University of Pittsburgh

8:30 AM Keynote

Understanding Dislocation Interactions with Interfaces: Josh Kacher¹; Ben Eftink¹; *Ian Robertson*¹; ¹University of Illinois

9:00 AM Keynote

Probing the Origin and Evolution of Strength in Small Volumes with In Situ TEM Nanomechanical Testing: *Andrew Minor*¹; ¹UC Berkeley & LBL

9:30 AM

Direct Observation of Dislocation Confined Layer Slip in Multilayers: *Nan Li*¹; Jian Wang¹; Jianyu Huang²; Amit Misra¹; ¹LANL; ²Sandia National Lab

9:45 AM

In Situ Observation of Dislocation Assisted Stress Driven Grain Boundary Migration: *Zhangjie Wang*¹; Zhiwei Shan¹; Ju Li²; Jun Sun¹; Evan Ma³; ¹Center for Advancing Materials Performance from the Nanoscale (CAMP-Nano) & Hysitron Applied Research Center in China (HARCC), State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University; ²Department of Nuclear Science and Engineering and Department of Materials Science and Engineering, Massachusetts Institute of Technology; ³Department of Materials Science and Engineering, Johns Hopkins University

10:00 AM

The Influence of Grain Boundary Structure upon Damage Evolution at Grain Boundary Interfaces: *Alejandro Perez-Bergquist*¹; Christian Brandl¹; Juan Escobedo¹; Carl Trujillo¹; Ellen Cerreta¹; George Gray III¹; Timothy Germann¹; ¹Los Alamos National Laboratory

10:15 AM Break

10:25 AM Keynote

Surface and Interface Controlled Plasticity and Phase Transition in Nanometer-Sized Au Crystals: *Scott Mao*¹; He Zheng¹; Jianyu Huang²; Christopher R. Weinberger²; ¹University of Pittsburgh; ²Sandia National Lab

TUESDAY AM



TMS 2012

141st Annual Meeting & Exhibition

10:55 AM Keynote

Grain Boundaries and Strength in Nanostructured Metals Produced by Plastic Deformation: *Xiaoxu Huang*¹; Niels Hansen¹; ¹Riso National Laboratory for Sustainable Energy, Technical University of Denmark

11:25 AM

Twinning in Bulk Nanolayered AgCu under High Strain Rate: *Ben Eftink*¹; Owen Kingstedt¹; Buyang Cao¹; Doug Safarik²; John Lambros¹; Nathan Mara²; Ian Robertson¹; ¹University of Illinois; ²Los Alamos National Lab

11:40 AM

Interfaces and Mechanical Properties of Highly Textured Cu/Co Multilayers: *Yue Liu*¹; Youxing Chen¹; Haiyan Wang¹; Ji Chen²; Xinghang Zhang¹; ¹Texas A&M University; ²Liaoning Shihua University

11:55 AM

Deformation and Spallation of Shocked Cu Bicrystals with S3 Coherent and Symmetric Incoherent Twin Boundaries: *Weizhong Han*¹; Sheng-Nian Luo¹; Timothy C Germann¹; Davis L Tonks¹; ¹Los Alamos National Lab

Mechanical Performance of Materials for Current and Advanced Nuclear Reactors: Characterization and Modeling of Dislocation Structures in Nuclear Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Nicholas Barbosa, National Institute of Standards & Tech; Greg Oberson, United States Nuclear Regulatory Commission; Matthew Kerr, United States Nuclear Regulatory Commission; Elaine West, Knolls Atomic Power Laboratory; Stuart Maloy, Los Alamos National Laboratory; Osman Anderoglu, LANL

Tuesday AM
March 13, 2012

Room: Swan 1
Location: Swan Resort

Session Chairs: Elaine West, Knolls Atomic Power Laboratory; Osman Anderoglu, Los Alamos National Laboratory

8:30 AM Invited

Understanding the Dislocation Processes and Interactions Responsible for Creating Defect-Free Channels in Deformed Irradiated Metals: Josh Kacher¹; Grace Liu¹; *Ian Robertson*¹; ¹University of Illinois

9:00 AM

Planar Dislocations and Dislocation Channeling in Unirradiated and Irradiated Austenitic Stainless Steels: *Young Suk Kim*¹; Sung Soo Kim¹; Dae Whan Kim¹; ¹Korea Atomic Energy Research Institute

9:20 AM

Incorporation of Dislocation Climb in Crystal Plasticity Models: *Alankar Alankar*¹; Alfredo Caro¹; Ricardo Lebensohn¹; ¹Los Alamos National Laboratory

9:40 AM

Polycrystalline Modelling of the Behaviour of Neutron Irradiated Zirconium Alloys and Comparison with TEM Observations: *Fabien Onimus*¹; ¹CEA

10:00 AM

The Interaction Energy between Point and Line Defects in BCC Iron: *Erin Hayward*¹; Blas Uberuaga²; Chaitanya Deo¹; Carlos Tome²; ¹Georgia Institute of Technology; ²Los Alamos National Laboratory

10:20 AM Break

10:35 AM

The Effect of Crowdions on the Dislocation Bias Factor: *Alexander Barashev*¹; Stanislav Golubov¹; Bachu Singh²; Roger Stoller¹; ¹Oak Ridge National Laboratory; ²Riso National Laboratory

10:55 AM

Atomic-Scale Study of Strengthening Due to Inclusion-type Obstacles in Iron: *Yury Osetskiy*¹; Roger Stoller¹; ¹ORNL

11:15 AM

Microstructural Evolution and Dislocation Density Analysis of HT9 Steel Irradiated in the FFTF: *Paula Mosbrucker*¹; Donald Brown¹; Levente Balogh¹; Stuart Maloy¹; Thomas Sisneros¹; ¹Los Alamos National Laboratory

11:35 AM

A Multiscale Investigation of the Interaction between Edge Dislocations and Voids in BCC Iron: *Sylvain Queyreau*¹; Jaime Marian¹; Anasthios Arsenlis¹; Brian D. Wirth²; ¹Lawrence Livermore National Laboratory; ²University of Tennessee

11:55 AM

Effects of 3He in ErT2: *Gillian Bond*¹; Clark Snow²; James Browning³; Mark Rodriguez²; James Knapp²; Ryan Wixom²; Peter Schultz²; Donald Cowgill²; ¹New Mexico Tech; ²Sandia National Laboratories; ³Oak Ridge National Laboratory

Nanocomposites: Energetic & Catalytic Nanocomposites

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Composite Materials Committee

Program Organizers: Garth Wilks, Air Force Research Laboratory; Jonathan Spowart, Air Force Research Laboratory; Meisha Shofner, Georgia Institute of Technology; John Zhanhu Guo, Lamar University

Tuesday AM
March 13, 2012

Room: Swan 8
Location: Swan Resort

Session Chairs: Christopher Crouse, Air Force Research Laboratory; John Zhanhu Guo, Lamar University

8:30 AM Invited

Synthesis, Reactivity and Mechanical Properties of Aluminized Fluorinated Acrylic (Alfa) Nanocomposites: *Christopher Crouse*¹; Christian Pierce¹; Jonathan Spowart¹; ¹Air Force Research Laboratory

9:10 AM

Silicon-Based Nanocomposites for Energetic Applications: *Paul Redner*¹; Neha Mehta¹; Karl Oylar¹; Gartung Cheng¹; Christopher Csernica¹; Jesse Sabatini¹; Jay Poret¹; Zhaohua Luan¹; Russell Broad¹; Deepak Kapoor¹; ¹US Army, RDECOM-ARDEC

9:30 AM Invited

Synthesis and Characterization of Nanoscale & Nanostructured Pyrophoric Nanocomposites: *Chris Haines*¹; Lauren Armstrong¹; Zac Doorebos²; Kendall Mills¹; Darold Martin¹; Jay Poret¹; Deepak Kapoor¹; ¹US Army ARDEC; ²Innovative Materials & Processes LLC

TUESDAY AM

10:10 AM

The Kinetics of Intermolecular Reactive Composites: *Mathew Cherukara*¹; Karthik Vishnu¹; Alejandro Strachan¹; ¹Purdue University

10:30 AM Break

10:50 AM

Bio-Conjugation of Catalytic Nanoparticles: *Robert Draper*¹; Soumen Das¹; David Reid¹; ¹University of Central Florida

11:10 AM

Comprehensive and Sustainable Recycling of Polymer Nanocomposites: *Jiahua Zhu*¹; John Zhanhu Guo¹; Suying Wei¹; ¹Lamar University

11:30 AM

Photocatalytic Degradation of TOC by Fe₂O₃/TiO₂ Coated on Light Ceramic: *Ju Hua*¹; ¹Harbin Institute of Technology

11:50 AM

Colloidal Ag-Pt/TiO₂ Nanocomposites for Photocatalysis: *Bijith Mankidy*¹; Vinay Gupta¹; Babu Joseph¹; ¹University of South Florida

12:10 PM

Nanodiamond – Polypyrrole Conductive Composite as Working Electrode for Cholesterol Electrochemical Detection: *Pedro Villalba*¹; Punya Basnayaka¹; Manoj Ram¹; Ashok Kumar¹; ¹University of South Florida

Neutron and X-Ray Studies of Advanced Materials V: Centennial: In Honor of Prof. G. Kostorz

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Xun-Li Wang, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Lyle Levine, National Institute of Standards and Technology; Peter Liaw, Univ of Tennessee; Yandong Wang, Beijing Institute of Technology; Brent Fultz, California Institute of Technology

Tuesday AM
March 13, 2012

Room: Southern I
Location: Dolphin Resort

Funding support provided by: Office of Basic Energy Sciences, U.S. Dept. of Energy, Dr. P. Thyagarajan

Session Chairs: Bernd Schoenfeld, ETH; Bennett Larson, ORNL

8:30 AM Introductory Comments Bernd Schoenfeld

8:35 AM Invited

From Diffuse Scattering to Ground State Structures: *Bernd Schoenfeld*¹; ¹ETH Zurich

8:55 AM Invited

In Situ Small-Angle X-Ray Scattering Studies of Formation, Aggregation and Dissolution of Nanoparticles in Suspension for Environmental Health and Safety: *Andrew Allen*¹; Matthew Martin¹; Robert MacCuspie¹; Vincent Hackley¹; Jan Ilavsky²; ¹NIST; ²Argonne National Laboratory

9:15 AM Invited

Size-Dependent Transitions in Nanostructured Zirconia-Scandia Solid Solutions. A High Temperature Synchrotron Diffraction Study: *Aldo Craievich*¹; Paula Abdala²; Diego Lamas³; ¹Institute of Physics - USP; ²ESRF; ³Facultad de Ingenieria - Universidad Nacional del Comahue

9:35 AM

Depth-Dependent Plastic and Elastic Strain Gradients from Polychromatic Microdiffraction: *Rozaliya Barabash*¹; ¹Oak Ridge National Laboratory

9:50 AM Invited

Kinetics of Nano Quasicrystal Formation from Zr-Based Metallic Glass Ribbons and Its Implication to the Heterogeneous Metallic Glass Structure: *Hiroshi Okuda*¹; Yusuke Maezawa¹; Ryo Arao¹; Shojiro Ochiai¹; Junji Saida²; ¹Kyoto University; ²Tohoku University

10:10 AM Invited

In-Situ Diffraction Studies of Microstructural Changes during Deformation and Irradiation: *Ralph Spolenak*¹; ¹ETH Zurich

10:30 AM Invited

Online Microcomputed X-Ray Computer Tomography of the In-Vivo Biodegradation of Mg Implants: Victor Wessels¹; Stefan Fischerauer²; Tanja Kraus²; Annelie-M. Weinberg²; Richard Kickingner³; Anja Hänni¹; Peter Uggowitzer¹; *Jörg Löffler*¹; ¹ETH Zurich; ²Medical University Graz; ³University of Applied Sciences Wels

10:50 AM Break

10:55 AM Invited

Combined Use of Small-Angle X-Ray and Neutron Scattering: SAS in Color: *Masato Ohnuma*¹; Yojiro OBA¹; Koppoju Suresh¹; Powel Kozikowski¹; ¹National Institute for Materials Science

11:15 AM Invited

Cascade Dynamics Information Possible from Sub-Picosecond X-Ray Scattering: *Bennett Larson*¹; Jon Tischler¹; Roger Stoller¹; ¹ORNL

11:35 AM Invited

Mechanics of Magnetic Shape Memory Alloys across the Length Scales: *Peter Müllner*¹; ¹Boise State University

11:55 AM Invited

Phonons in Martensite and Austenite NiMnGa - Its Relation to Ferromagnetic Shape Memory: *Winfried Petry*¹; Semih Ener¹; Jürgen Neuhaus¹; ¹Technische Universität München (Munich University of Technology)

12:15 PM Invited

Multiple Whole X-Ray Line Profile Analyses for Investigating the Role and Nature of Dislocations in Plastic Deformation of Semicrystalline Polymers: *Michael Zehetbauer*¹; Florian Speckermann¹; Gerald Polt¹; Harald Wilhelm²; Michael Kerber¹; Sigrid Bernstorff³; Erhard Schafner¹; ¹University of Vienna; ²Laboratory of Polymer Engineering LKT-TGM; ³Sincrotrone Trieste

12:35 PM Invited

Energy-Dispersive Synchrotron Diffraction – a Versatile Method for Advanced Materials Characterization: *Christoph Genzel*¹; ¹Helmholtz-Zentrum Berlin für Materialien und Energie

TUESDAY AM



TMS 2012

141st Annual Meeting & Exhibition

Pb-Free Solders and Other Materials for Emerging Interconnect and Packaging Technologies: Effects of Ultrafine Joints and Alloy/microstructure Relationships

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Iver Anderson, Ames Laboratory; Sung Kang, IBM; Albert Wu, National Central Univ; Laura Turbini, Research in Motion; Tae-Kyu Lee, Cisco Systems; Govindarajan Muralidharan, Oak Ridge National Lab; John Elmer, Lawrence Livermore National Lab; Yan Li, Intel

Tuesday AM
March 13, 2012

Room: Swan 9
Location: Swan Resort

Session Chair: To Be Announced

8:30 AM Invited

Linkages between Microstructure and Mechanical Properties of Ultrafine Interconnections: Zhiyong Wu¹; Zhiheng Huang¹; Hua Xiong¹; Paul Conway²; ¹Sun Yat-Sen University; ²Loughborough University

8:55 AM

Silver Addition Effects on the Ni-Sn Interfacial Reaction for 3D IC Applications: J. J. Yu¹; H. Y. Chuang¹; M. S. Kuo¹; W. L. Shih¹; C. Kao²; ¹National Taiwan University; ²National Taiwan University

9:15 AM

Effect of Minor Alloy Additions on the Interfacial Reactions with Low Solder Volume for 3D IC Applications: Ting-Li Yang¹; C. Robert Kao¹; ¹National Taiwan University

9:35 AM

Preferred Orientation of 30 \956m Fine Pitch Sn2.5Ag Micro-Bumps Studied by Synchrotron Polychromatic X-Ray Laue Microdiffraction: Tian Tian¹; Kai Chen²; Martin Kunz²; Nobumichi Tamura²; Tao-Chih Chang³; Chau-Jie Zhan³; King-Ning Tu¹; ¹UCLA; ²Lawrence Berkeley National Laboratory; ³Industrial Technology Research Institute

9:55 AM

Thermomigration on 3D IC Pb-Free Micro Bump: Wei-Cheng Jhu¹; Fan-Yi Ouyang¹; ¹National Tsing Hua university

10:15 AM

Effects of Small Solder Volume on the Cu/Sn/Cu Interfacial Reactions for 3D IC Applications: Meng Hsin Chen¹; Hsin Yi Chuang¹; Ting Li Yang¹; C. Robert Kao¹; ¹National Taiwan University

10:35 AM Break

10:45 AM

Volume Shrinkage Induced by Interfacial Reaction in Micro Ni/Sn/Ni Structure: C. Li¹; H. Chuang¹; M. Kuo¹; C. Kao¹; ¹National Taiwan University

11:05 AM Invited

The Effect of Doping Nd on the Oxidation Resistance and Wettability of Sn-0.7Cu Solder: Jian Zhou¹; Yi-Li Fang¹; Xu Chen¹; Yang-Shan Sun¹; Feng Xue¹; ¹Southeast University

11:30 AM

Single-Joint Shear Strength of Micro Cu Pillar Bumps with Different Amounts of Intermetallics: Yu-Jen Chen¹; C. Robert Kao¹; ¹National Taiwan University

11:50 AM

Interfacial Reactions in the Sn-Co-Cu/Ni Couples: Chih-Ming Chen¹; Chia-Ming Hsu¹; Sinn-Wen Chen¹; ¹National Tsing Hua University

12:10 PM

Microstructural Evolution in SnAgCu Solders and Effect on Constitutive Response During Creep: Babak Talebanpour¹; Praveen Kumar²; Zhe Huang¹; Chien-Hung Wen¹; Indranath Dutta¹; ¹Washington State University; ²Indian Institute of Science

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XI: Interfacial Reactions of the Pb-free Solder Joints

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikoo Ohnuma, Tohoku University; Clemens Schmetterer, TU Bergakademie Freiberg; Yee-Wen Yen, National Taiwan University of Science and Technology; Shih-Kang Lin, University of Wisconsin – Madison

Tuesday AM
March 13, 2012

Room: Swan 10
Location: Swan Resort

Session Chairs: Albert T. Wu, National Central University; Jae-Ho Lee, Hongik University

8:30 AM Invited

Kinetics of Solid-State Reactive Diffusion in the Sn/(Ni-X) System: Masanori Kajihara¹; ¹Tokyo Institute of Technology

8:50 AM Invited

Properties of Au-Ge Based Alloys for High Temperature Lead Free Solders: Christian Leinenbach¹; Shan Jin¹; Fabrizio Valenza²; Donatella Giuranno²; Rada Novakovic²; Hans-Rudolf Elsener¹; Jiang Wang¹; Simona Delsante³; Gabriella Borzone³; Andrew Watson⁴; ¹Empa-Swiss Federal Laboratories for Materials Science and Technology; ²National Research Council (CNR) – Institute for Energetics and Interphases (IENI); ³University of Genova; ⁴University of Leeds

9:10 AM

Study of Intermetallic Compound Growth of Sn-2.3Ag Solder Micro-Bumps during Solid-State Aging: Tao-Chi Liu¹; Yi-Sa Huang¹; Chin-Hsing Tang¹; Chih-Rong Chen²; Chih Chen¹; ¹National Chiao Tung University; ²Integrated Service Technology Inc

9:25 AM

Reflow and Solid-State Reactions between SnAgCu-xNi Solder and Au/Pd/Ni Surface Finish: Bo-Mook Chung¹; Yong-Ho Baek¹; Jaeho Choi²; Joo-Youl Huh¹; ¹Korea University; ²Gangneung-Wonju National University

9:40 AM

Effect of Interfacial Compound Layer on Pd Resettlement during Reflow and Solid-State Reactions between Sn-rich Solder and Ni Substrate: Yong-Ho Baek¹; Bo-Mook Chung¹; Jaeho Choi²; Joo-Youl Huh¹; ¹Korea University; ²Gangneung-Wonju National University

9:55 AM

Employment of a Bi-Layer of NiP/Cu as a Diffusion Barrier Layer for Cu bump/Sn Bonding Structures for the 3D Integration Applications: Byunghoon Lee¹; Haseok Jeon¹; Hoo-Jeong Lee¹; ¹Sungkyunkwan University

10:10 AM Break

10:25 AM Invited

The Impacts of Palladium Addition on Phase Formation, Microstructure Evolution and Mechanical Reliability in Sn-Ag-Cu/ENEPIG and Sn-Ag-Cu-Pd/ENIG Solder Joint: Chien Fu Tseng¹; I-Dai Wang¹; Tae-Kyu Lee²; Kuo-Chuan Liu²; Chih-Yuan Cheng³; Jim Wang³; *Jeng-Gong Duh*¹; ¹National Tsing Hua Univ; ²Cisco Systems Inc.; ³Shenmao Technology Inc.

10:45 AM

The Interfacial Reaction between Diffusion Barrier and Thermoelectric Materials under Current: *Li-Chen Lo*¹; Albert T. Wu¹; Tai-Ying Lin¹; ¹National Central University Department of Chemical and Material Engineering

11:00 AM

Interfacial Reactions of the Sn-xZn/Au Couples: *Yee-Wen Yen*¹; Hsien-Ming Hsiao¹; Cheng-Kuan Lin¹; ¹National Taiwan Univ of Science & Tech

11:15 AM

Asymmetrical Microstructure on the Two Joint Interfaces of Flip-chip Cu/Sn/Cu Solder Joints: Cheng-Yi Liu¹; *Yu Jin Hu*¹; ¹National Central University

11:30 AM

Influence of Stress on the Microstructural Development of Sn-Ag-Cu Solder Alloy during Aging: *Choong-Un Kim*¹; Huili Xu¹; Tae-Kyu Lee²; Hong-Tao Ma²; Kuo-Chuan Liu²; ¹The University of Texas at Arlington; ²Cisco System Incorporation

11:45 AM

Effect of Bump Height on Interfacial Reaction of Cu/SnAg/Ni Structure: *Yi-Sa Huang*¹; Chin-Hsing Tang¹; Chih Chen¹; ¹National Chiao Tung University

Phase Transformations and Deformation in Magnesium Alloys: Phase Transformations and Deformation

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee
Program Organizers: Jian-Feng Nie, Monash University; Sean Agnew, University of Virginia; Suveen Mathaudhu, Army Research Office

Tuesday AM
March 13, 2012

Room: Southern V
Location: Dolphin Resort

Session Chairs: Jian-Feng Nie, Monash University; Tresa Pollock, University of California Santa Barbara

8:30 AM Introductory Comments Jian-Feng Nie, Sean Agnew and Suveen Mathaudhu

8:35 AM Invited

Key Issues in Thermodynamic Mg Alloy Database: *Rainer Schmid-Fetzer*¹; ¹Clausthal University of Technology

9:00 AM Invited

Grain Refinement of Magnesium Alloys: Theoretical Developments and Their Application: *David StJohn*¹; Ma Qian¹; Mark Easton²; ¹University of Queensland; ²Monash University

9:25 AM Invited

Enhancement of Precipitation Hardening of Magnesium Alloys by Microalloying: *Kazuhiro Hono*¹; C. L. Mendis¹; T. T. Sasaki¹; T. Ohkubo¹; T. Bhattacharjee¹; ¹National Institute for Materials Science

9:50 AM Invited

Modeling Nucleation and Growth during Co-Precipitation in Mg-RE Alloys: Yipeng Gao¹; Hong Liu²; Jianfeng Nie²; *Yunzhi Wang*¹; ¹The Ohio State University; ²Monash University

10:15 AM Break

10:25 AM Invited

Mg-M-RE Alloys Containing LPSO Structures with Synchronization of Stacking and Chemical Modulations: *Yoshihito Kawamura*¹; Michiaki Yamasaki¹; Eiji Abe²; Koji Hagihara³; ¹Kumamoto University; ²The University of Tokyo; ³Osaka University

10:50 AM

On the Structure, Transformation and Deformation of Long-Period Ordered Structures in Mg-Y-Zn Alloys: Yuman Zhu¹; Allan Morton²; *Jian-Feng Nie*¹; ¹Monash University; ²CSIRO

11:15 AM Invited

Creep Mechanism in a Mg-6Al-3Ca-0.3Mn Alloy: *Tomoyuki Homma*¹; S. Nakawaki¹; Shigeharu Kamado¹; ¹Nagaoka University of Technology

11:40 AM Invited

Deformation in Magnesium from First-Principles: *Dallas Trinkle*¹; Joseph Yasi¹; Louis Hector²; ¹University of Illinois, Urbana-Champaign; ²General Motors R&D Center

12:05 PM

In-Situ Neutron Diffraction Study of Aging of a Mg-Y-Nd-Zr Alloy (WE43): Effects of Precipitation on Individual Deformation Mechanism Strength and Activity: *Sean Agnew*¹; F. Polesak¹; Bjorn Clausen²; ¹University of Virginia; ²Los Alamos National Laboratory

Randall M. German Honorary Symposium on Sintering and Powder-Based Materials: Powder Technology

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: K. Morsi, San Diego State University; Fernand Marquis, Naval Postgraduate School; John Meyer, Iowa State University; Ahmed El-Desouky, San Diego State University; Eugene Olevsky, San Diego State University

Tuesday AM
March 13, 2012

Room: Oceanic 2
Location: Dolphin Resort

Session Chair: Iver Anderson, Iowa State University

8:30 AM Keynote

Nanostructured Metals: Synthesis and Behavior from the Nanoscale to the Microscale: *Enrique J. Lavernia*¹; ¹University of California, Davis

9:00 AM Invited

Effect of Powder Synthesis and Processing on Luminescence Properties: *Joanna McKittrick*¹; Jinkyu Han¹; Jae Ik Choi¹; Jan Talbot¹; ¹University of California, San Diego

9:25 AM Invited

Improved Understanding of Gas and Melt Flow Manipulation for Enhanced Control of Powder Yields from Close-Coupled Gas Atomization Processing: *Iver Anderson*¹; Joel Rieken²; John Meyer²; David Byrd¹; Andrew Heidloff¹; ¹Ames Laboratory; ²Iowa State University

9:50 AM Invited

Production, Characterization and Application of Mono-Size Alloy Droplets: *Teiichi Ando*¹; ¹Northeastern University



TMS 2012

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10:15 AM Break

10:30 AM Invited

TEM Guided Microstructural Design of MgH₂ Powders and Thin Film Alloys with Room Temperature Volumetric Hydrogen Cycling Ability: *David Mitlin*¹; Peter Kalisvaart¹; Mohsen Danaie¹; Shu Tao²; Ben Zahiri¹; Helmut Fritzsche³; ¹University of Alberta and NINT NRC; ²Eindhoven University of Technology; ³SIMS-CNRC NRC

10:55 AM

Effect of Pre-Consolidation Solidification Structure in Novel Gas Atomization Precursor Powder Approach for Efficient Production of Ni-based Oxide Dispersion Strengthened (ODS) Alloys: *John Meyer*¹; Joel Rieken²; Iver Anderson²; ¹Iowa State University; ²Ames Laboratory, US DOE

11:10 AM

Effect of Rapid Solidification and Heat Treatment on D2 Tool Steel: *Pooya Delshad Khatibi*¹; Hani Henein¹; Douglas Ivey¹; ¹University of Alberta

Recycling General Sessions: Metals

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
Program Organizer: Joseph Pomykala, Alter Trading

Tuesday AM

March 13, 2012

Room: Europe 4

Location: Dolphin Resort

Session Chair: Joseph Pomykala, Alter Trading

8:30 AM

Advantages of Long Term Al Recycling Batch Planning in a Constrained Secondary Material Market: *Tracey Brommer*¹; Britt Elin Gihleengen²; Elsa Olivetti¹; Randolph Kirchain¹; ¹Massachusetts Institute of Technology; ²Norsk Hydro

8:50 AM

Mechanical Dross Processing: The Approach to Zero Waste from Smelter and Secondary Dross: *David Roth*¹; ¹GPS Global Solutions

9:10 AM

Recycling of Aluminium Alloy Scraps by Pressure-Assisted Investment Casting for Aluminium Foam Manufacture: *Seksak Asavavisitthachai*¹; Areeya Srichaiyaperk¹; Natthida Jareankieathbovorn¹; ¹Chulalongkorn University

9:30 AM

In-Process Separation of Mill Scale From Oil at Steel Hot Rolling Mills: *Naiyang Ma*¹; ¹ArcelorMittal

9:50 AM

Recycling of Electric Arc Furnace Dust: *Vicente Sobrinho*¹; Vitor Telles²; Felipe Grillo²; Jose Oliveira¹; Jorge Alberto Tenorio²; Denise Espinosa²; ¹IFES; ²USP

10:10 AM Break

10:30 AM

Recycling of Electric Arc Furnace Dust in Iron Ore Sintering: *Victor Telles*¹; Denise Espinosa¹; Jorge Tenório¹; ¹University of Sao Paulo - USP

10:50 AM

Extraction of Iron Oxide and Concentration of Titanium Compounds in Bauxite Residue: Edilson Magalhães¹; Emanuel Macêdo¹; José Antonio Souza¹; João Nazareno Quaresma¹; Danielly Quaresma¹; *Luis Venancio*¹; ¹Federal University of Pará

11:10 AM

Pyrometallurgical Approaches for Utilization of Smelting Slag from Cobalt Concentrate: *Jeongsoo Sohn*¹; Kang-In Rhee¹; Soo-Kyung Kim¹; ¹Korea Institute of Geoscience and Mineral Resources

11:30 AM

Heat Treatment of Black Dross for the Production of a Value Added Material - A Preliminary Study: *Reza Beheshti*¹; Shahid Akhtar²; Ragnhild E. Aune³; ¹KTH; ²NTNU; ³NTNU, KTH

11:50 AM

Development of Synthetic Flux for Basic Oxygen Steel Making Using Waste Oxides of Steel Plant: *Jagannath Pal*¹; S. Ghorai¹; P. Venkatesh¹; D. P. Singh¹; M. C. Goswami¹; D. Bandyopadhyay¹; S. Ghosh¹; ¹Council of Scientific and Industrial Research, National Metallurgical Laboratory

12:10 PM

Addition of Electric Arc Furnace Dusts in Hot Metal: *Felipe Grillo*¹; Denise Espinosa¹; Jose Oliveira²; Jorge Tenório¹; ¹University of Sao Paulo - USP; ²Federal Institute of Espirito Santo

Science and Engineering of Light Metal Matrix Nanocomposites and Composites: Metal Matrix Composites

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division
Program Organizers: Xiaochun Li, University of Wisconsin-Madison; Alan Luo

Tuesday AM

March 13, 2012

Room: Macaw 2

Location: Swan Resort

Session Chairs: Alan Luo, GM; Xiaochun Li, University of Wisconsin-Madison

8:30 AM

Slow-Shot High Pressure Die-Casting (SS-HPDC) Process for AE44 Magnesium Single-Cylinder Engine Block with Short-Fiber Reinforcement in the Bore: *Bin Hu*¹; Pan Wang¹; Bob Powell²; Xiaogin Zeng³; ¹Genral Motor China Science Lab; ²General Motors Global R&D Center; ³Shanghai Jiao Tong University

8:50 AM

Compressive Properties of Al-B4C Composites over the Temperature Range of 25 - 500 °C: *Srinu Gangolu*¹; A Rao²; N Prabhu¹; V Deshmukh²; B Kashyap¹; ¹Indian Institute of Technology Bombay; ²Naval Materials Research Laboratory

9:10 AM

Mechanical Properties of a Spherical Particle Reinforced Aluminum Composite after Metal Working: *William Harrigan*¹; ¹Gamma Technology

9:30 AM

Effect of Processing on the Dynamic Response of a Silicon Carbide Reinforced Aluminum Metal Matrix Composite: *Brandon McWilliams*¹; Tomoko Sano¹; Jian Yu¹; Chian Yen¹; ¹US Army Research Laboratory

9:50 AM

Fabrication and Characterization of Al-SiC Composite Foam: *Geo Harrison*¹; Ganapathy Subramanian¹; Vinoth Kambli¹; Pradeep Kumar¹; ¹College of Engineering Guindy, Anna University

TUESDAY AM

10:10 AM Break

10:25 AM

Aluminum Metal Matrix Composite via Direct Metal Laser Deposition: Processing And Mechanical Characterization: *Benjamin Waldera*¹; Samar Kalita¹; ¹Advanced Engineered Materials Center - University of North Dakota

10:45 AM

A Microstructure-Sensitive Fatigue Model for SiC Reinforced AA6061 Metal Matrix Composites: *Andrew Brammer*¹; J Jordan¹; ¹The University of Alabama

11:05 AM

Damage Evolution Model for Hybrid Metal Matrix Composites: *Jessica Dibelka*¹; Scott Case¹; ¹Virginia Polytechnic Institute and State University

11:25 AM

Numerical Simulation of Pressure Infiltration Process for Making Metal Matrix Composites: Effect of Process Parameters: Bo Wang¹; *Krishna M. Pillai*¹; ¹University of Wisconsin-Milwaukee

11:45 AM

A Parametric Study of Hot Rolling of an Aluminum MMC via ANSYS and LS-DYNA: *Charles Mansfield*¹; Nathan Mutter¹; Ali Gordon¹; ¹UCF

Solar Cell Silicon: Refining and Characterization

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Conversion and Storage Committee, TMS: Recycling and Environmental Technologies Committee
Program Organizers: Arjan Ciftja, SINTEF; Gabriella Tranell, Norwegian University of Science and Technology; Gregory Hildeman, Consultant; Shadia Ikhmayies, Al Isra University

Tuesday AM
March 13, 2012

Room: Europe 7
Location: Dolphin Resort

Session Chair: Arjan Ciftja, SINTEF Materials and Chemistry

8:30 AM

High Frequency EM Purification of Silicon: Lucas Damoah¹; *Lifeng Zhang*¹; ¹Missouri University of Science and Technology

8:55 AM

Mono-Like Ingot/Wafers Made of Solar-Grade Silicon for Solar Cells Application: Sergey Beringov¹; Timur Vlasenko¹; Sergiy Yatsuk¹; Oleksandr Liaskovskiy¹; *Iryna Buchovska*¹; ¹Pillar Group

9:15 AM

Preparation and Characterizations of Hydrogenated Microcrystalline Silicon Germanium Thin Films Prepared by RF Magnetron Sputtering: *C. H. Chang*¹; C. W. Chang²; H. S. Chen¹; J. P. Chu¹; ¹National Taiwan University of Science and Technology; ²Industrial Technology Research Institute

9:35 AM

Removal of Phosphorus from Silicon Melts by Vacuum Refining: *Buhle Kakalash*¹; Jafar Safarian²; Merete Tangstad²; ¹Mintek; ²NTNU

9:55 AM

Thermodynamics of Phosphorous Distribution between Si and Fe-Si in Solvent Refining of Silicon: *Leili Tafaghodi Khajavi*¹; Mansoor Barati¹; ¹University of Toronto

10:15 AM Break

10:35 AM

Imaging Techniques for the Characterization of Multi-Crystalline Silicon Bricks and Wafers: *Steve Johnston*¹; Fei Yan¹; Katherine Zaunbrecher²; Mowafak Al-Jassim¹; Omar Sidelkheir³; Alain Blossse³; ¹National Renewable Energy Laboratory; ²Colorado State University; ³Calisolar

10:55 AM

Silicon PV Wafers: Correlation of Mechanical Properties and Crack Propagation with Defects and Stresses: *Khaled Youssef*¹; Meirong Shi¹; Prashant Kulshreshtha¹; George Rozgonyi¹; ¹North Carolina State University

11:15 AM

Thermodynamics on Boron Rejection during Metallurgical Grade Silicon Oxidation by Silicon Dioxide: *Yaqiong Li*¹; Yi Tan¹; Jiayan Li¹; Shenrui Wu¹; Yao Liu¹; ¹Dalian University of Technology

11:35 AM

On the Segregation of Impurities in Solar Silicon: *Kader Zaidat*¹; Abdallah Nouri¹; Yves Delannoy¹; ¹Grenoble-INP

11:55 AM

Effect of Solute Hydrogen on Toughness of Feed Stock Polycrystalline Silicon for Solar Cell Applications: *Mohamad Zhib*¹; Megan Reynolds¹; Uttara Sahaym¹; Grant Norton¹; David Bahr¹; Wayne Osborne²; ¹Washington State University; ²REC Silicon

Solid-State Interfaces II: Toward an Atomistic-Scale Understanding of Structure, Properties, and Behavior through Theory and Experiment: Interface Interaction with Defects

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Nanomechanical Materials Behavior Committee
Program Organizers: Xiang-Yang Liu, Los Alamos National Lab; Douglas Spearot, University of Arkansas; Guido Schmitz, University of Münster; David Seidman, Northwestern University

Tuesday AM
March 13, 2012

Room: Oceanic 7
Location: Dolphin Resort

Funding support provided by: Los Alamos National Laboratory

Session Chairs: Richard Hoagland, Los Alamos National Lab; Alfredo Caro, Los Alamos National Lab

8:30 AM Invited

On the Feasibility of Designing Interfaces Immune to Helium Damage: *Michael Demkowicz*¹; Abishek Kashinath¹; Amit Misra²; Nan Li²; ¹Massachusetts Institute of Technology; ²Los Alamos National Laboratory

9:00 AM Invited

Effect of Nanoparticle-Matrix Interfaces on Cavity Formation in ODS Ferritic Steels under Dual-Beam Irradiation: *Luke Hsiung*¹; ¹Lawrence Livermore National Laboratory

9:30 AM

Interface Microstructure Evolution of Heterogeneous Systems under Vacancy Supersaturation: *Enrique Martinez Saez*¹; Jeffery Hetherly¹; Alfredo Caro¹; Michael Nastasi¹; ¹LANL



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9:50 AM

Interface Structures, Defects, and Mechanical Properties at fcc-bcc Interfaces from “Tunable” Potentials: *Xiang-Yang Liu*¹; Richard Hoagland¹; Jian Wang¹; Blas Uberuaga¹; Michael Demkowicz²; Michael Nastasi¹; Amit Misra¹; ¹Los Alamos National Lab; ²Massachusetts Institute of Technology

10:10 AM Break

10:20 AM Invited

Defect-Interface Interactions in Oxide Ceramics: *Blas Uberuaga*¹; ¹Los Alamos National Laboratory

10:50 AM

On the Solute/Interface-Interaction in the Framework of a Defactant Concept: *Reiner Kirchheim*¹; ¹University of Göttingen

11:10 AM

Interface Facets Identified with Singularity in Interfacial Structures: *Wenzheng Zhang*¹; Xinfu Gu¹; ¹Tsinghua University

11:30 AM

On the Factors Governing the Sink Strength of Semicohherent fcc-bcc Interfaces: *Kedarnath Kolluri*¹; Michael Demkowicz¹; ¹Massachusetts Institute of Technology

11:50 AM

Energetics of Point Defect and Impurity Segregation to Grain Boundaries in Fe: *Mark Tschoopp*¹; Kiran Solanki²; Nathan Rhodes³; ¹MSU/CAVS; ²Arizona State University; ³University of Florida

Symposium in Memory of Patrick Veysseyre: Understanding the Mechanisms Controlling Plastic Flow: Screw Dislocations-lattice Friction

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division

Program Organizers: Georges Saada, LEM CNRS ONERA; Dennis Dimiduk, Air Force Research Laboratory; Hael Mughrabi, University Erlangen-Nuernberg; Haruyuki Inui, Kyoto University

Tuesday AM

March 13, 2012

Room: Europe 6

Location: Dolphin Resort

Funding support provided by: National Science Foundation

Session Chairs: H. Inui, Kyoto University; M. Mills, Ohio State University

8:30 AM Invited

The Role of the Initial Dislocation Density in Controlling Size-Affected Flow Response: *Jaafar El-Awady*¹; Michael Uchic²; Dennis Dimiduk²; Satish Rao³; Christopher Woodward²; ¹Johns Hopkins University; ²Air Force Research Laboratory; ³UES Inc.

9:05 AM Invited

Atomistic Simulations of Intersection Cross-Slip Nucleation in Face-Centered Cubic Materials: *Satish Rao*¹; Dennis Dimiduk²; Michael Uchic²; Triplicane Parthasarathy¹; Jaafar El-Awady³; Christopher Woodward²; ¹UES Inc.; ²Air Force Research Laboratory; ³Johns Hopkins University

9:25 AM Invited

Kinetics of Screw Dislocations in Fe and Fe Alloys at Low Temperatures: *Daniel Caillard*¹; ¹CNRS

9:55 AM Invited

A New Type of Dislocation Source in BCC Molybdenum: *Qing-Jie Li*¹; Xiang-Dong Ding¹; Zhi-Wei Shan¹; Ju Li²; Jun Sun¹; Evan Ma³; ¹Center for Advancing Materials Performance from the Nanoscale (CAMP-Nano) & Hysitron Applied Research Center in China (HARCC), State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University; ²Department of Nuclear Science and Engineering and Department of Materials Science and Engineering, MIT; ³Department of Materials Science and Engineering, Johns Hopkins University

10:15 AM Break

10:30 AM Invited

Elevated Temperature Deformation Mechanisms in Ta2C: *Nicholas De Leon*¹; Billie Wang¹; ¹The University of Alabama

11:00 AM Invited

Screw Dislocations in Zirconium: an ab Initio Study: *Emmanuel Clouet*¹; ¹SRMP, CEA Saclay

11:20 AM Invited

Experimental Study and Finite Element Computation of the Single Crystal Behavior of Zirconium: Cyril Lebon¹; *Fabien Onimus*¹; Eva Héripé; Laurent Dupuy¹; Ludovic Vincent¹; Xavier Feaugas³; ¹CEA; ²Ecole Polytechnique; ³University of La Rochelle

11:40 AM Invited

Atomistic Simulations of Kinks on 1/2<110> Screw Dislocation in Magnesium Oxide: *Philippe Carrez*¹; Patrick Cordier¹; ¹Lab. UMET CNRS-UMR8207

Titanium: Advances in Processing, Characterization and Properties: Microstructure Evolution and Characterization I

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Christopher Szczepanski, US Air Force Research Laboratory; Vasisht Venkatesh, Pratt & Whitney

Tuesday AM

March 13, 2012

Room: Oceanic 3

Location: Dolphin Resort

Session Chairs: Lee Semiatin, US Air Force Research Laboratory; Peter Collins, University of North Texas; Adam Pilchak, US Air Force Research Laboratory

8:30 AM Invited

Formation of Transformation Texture in Supertransus Heat Treated Ti-6Al-4V Sheet: Gordon Sargent¹; Adam Pilchak¹; Kacey Kinsel¹; *Lee Semiatin*¹; ¹US Air Force Research Laboratory

9:00 AM Invited

Variant Selection during Alpha Precipitation in Ti-6Al-4V under the Influence of Local Stress – A Simulation Study: Rongpei Shi¹; *Yunzhi Wang*¹; ¹Ohio State University

9:30 AM

Role of Grain-Boundary Characteristics on the Evolution of Allotriomorphic Alpha in Titanium Alloys: *Vikas Dixit*¹; G.B. Viswanathan²; W.A.T. Clark¹; Hamish L. Fraser¹; ¹The Ohio State University; ²Air Force Research Laboratory

TUESDAY AM

9:50 AM

Phase Separation and Its Subsequent Influence on Alpha Nucleation in Titanium Alloys: *Soumya Nag*¹; Arun Devaraj¹; Yufeng Zheng²; Robert Williams²; Jaimie Tiley³; Hamish Fraser²; Rajarshi Banerjee¹; ¹University of North Texas; ²The Ohio State University; ³Air Force Research Laboratory

10:10 AM

Morphological, Structural and Compositional Evolution during the Decomposition of Martensite in Ti-2wt%Mo: *Yufeng Zheng*¹; Robert Williams¹; Rongpei Shi¹; Yunzhi Wang¹; Hamish Fraser¹; ¹The Ohio State University

10:30 AM Break

10:50 AM Invited

Recent Studies on the Evolution of Microstructure in Ti-Based Alloys: *Peter Collins*¹; Peyman Samimi¹; Iman Ghamarian¹; Brian Welk²; Dan Huber²; Rajarshi Banerjee¹; Hamish Fraser²; ¹University of North Texas; ²The Ohio State University

11:20 AM

Microstructures in Solid-State Welds of Martensitic and Non-Martensitic Transforming Titanium Alloys: *Thomas Broderick*¹; Adam Pilchak²; Jonathan Orsborn³; Taylor Pratt¹; Andrew Woodfield¹; Hamish Fraser³; ¹General Electric Aviation; ²AFRL Materials and Manufacturing Directorate; ³The Ohio State University

11:40 AM

Microstructure and Mechanical Properties of a Copper Containing Three Phase Titanium Alloy: *Srikant Gollapudi*¹; Tapash Nandy¹; Rajdeep Sarkar¹; Ashok Gogia¹; Sankarasubramanian R¹; Chinta Babu U¹; ¹DMRL

12:00 PM

Recrystallization Behavior in Ti-13Cr-1Fe-3Al Alloy after Severe Plastic Deformation: *Masato Ueda*¹; Hikaru Matsuhira¹; Yuji Takasaki¹; Masahiko Ikeda¹; Yoshikazu Todaka²; ¹Kansai University; ²Toyohashi University of Technology

T.T. Chen Honorary Symposium on Hydrometallurgy, Electrometallurgy and Materials Characterization: Base Metal Processing

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee

Program Organizers: Shijie Wang, Rio Tinto Kennecott Utah Copper; J. E. Dutrizac, CANMET; Michael Free, University of Utah; J. Y. Hwang, Michigan Technological University; Daniel Kim, Rio Tinto Kennecott Utah Copper

Tuesday AM
March 13, 2012

Room: Oceanic 5
Location: Dolphin Resort

Funding support provided by: Rio Tinto Kennecott Utah Copper, ASARCO, and Freeport McMoRan

Session Chair: Daniel Kim, Rio Tinto Kennecott Utah Copper

8:30 AM

The Development of China's Copper Primary Smelting Technology: *Kaixi Jiang*¹; Lan Li¹; Yaping Feng¹; Haibei Wang¹; Bang Wei¹; *Xiaoping Zou*²; ¹Beijing General Research Institute of Mining and Metallurgy; ²Beijing General Research Institute of Mining & Metallurgy

8:50 AM

New Process for Treating SCF Flue Dust at Atlantic Copper: *Guillermo Rios*¹; Joan Viñals²; Alba Sunyer²; Cristina Arbizu¹; ¹Atlantic Copper; ²University of Barcelona

9:10 AM

Direct Leaching Alternatives for Zinc Concentrates: *Kurt Svens*¹; ¹K. R. Svens Consulting Incorporation

9:30 AM

The Effect of Polytetrafluoroethylene on Pressure Oxidation of Chalcopyrite: *Jin Nuo*¹; *Eduard Guerra*¹; ¹Laurentian University

9:50 AM

The Effect of Complexing Agents and the Anode Material on the Kinetics of Electro-Assisted Reduction of Chalcopyrite: *Eliezer Martinez-Jimenez*¹; *Gretchen Lapidus-Lavigne*¹; ¹Universidad Autonoma Metropolitana-Iztapalapa

10:10 AM Break

10:30 AM

Nickel Smelter Slag Microstructure and Its Effect on Slag Leachability: *Ilya Perederiy*¹; *Vladimiro Papangelakis*¹; Indje Mihaylov²; ¹University of Toronto; ²Vale Base Metals Technology Development

10:50 AM

Characterization of Aluminum Cathode Sheets Used for Zinc Electrowinning: *Neil Gao*¹; Daniel Liu¹; Maura Malone¹; ¹Teck Metals Ltd.

11:10 AM

Mechanical Pretreatment of Lead Based Alloy Anode for Zinc Electrowinning: *Taro Aichi*¹; Rie Sato¹; Makoto Muramatsu²; Hideyuki Takahashi²; Kazuyuki Tohji²; ¹Dowa Metals and Mining Co., Ltd.; ²Tohoku University

11:30 AM

Duplex Stainless Steel Corrosion in a Zinc Plant Purification Filter Application: *Timothy Moore*¹; Michael Heximer¹; Dominic Verhelst¹; ¹Teck Metals Ltd

Ultrafine Grained Materials VII: Mechanical Response

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Xiaoxu Huang, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; Hyoung Seop Kim, POSTECH; Terence Langdon, University of Southern California; Terry Lowe, Manhattan Scientifics, Inc.; Ruslan Valiev, Ufa State Aviation Technical University; Xiaolei Wu, Institute of Mechanics, Chinese Academy of Sciences; Michael Zehetbauer, University of Vienna

Tuesday AM
March 13, 2012

Room: Swan 4
Location: Swan Resort

Session Chairs: Justin Scott, Institute for Defense Analysis; Joel House, Air Force Research Laboratory; Xiaoxu Huang, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; Pei-Ling Sun, Feng Chia University

8:30 AM Invited

Some Common Features of Ultrafine Grained and Nanocrystalline Bcc Metals Produced by Severe Plastic Deformation: *Qiuming Wei*¹; Laszlo Kecskes²; Suveen Mathaudhu³; Brian Schuster²; ¹University of North Carolina at Charlotte; ²US ARL; ³US ARO



TMS 2012

141st Annual Meeting & Exhibition

TUESDAY AM

8:50 AM

Dynamic Loading of Ultrafine-Grained Aluminum: *Matthias Hockauf*¹; Lothar Meyer²; Martin Wagner¹; ¹Chemnitz University of Technology; ²Nordmetall Research and Consulting GmbH

9:05 AM

Quasi-Static and Dynamic Compressive Mechanical Behavior of Friction Stir Processed Ultrafine Grained Al-Mg-Sc Alloy: *Nilesh Kumar*¹; R. Mishra¹; R. Howell²; K. Cho²; ¹Missouri University of Science & Technology; ²Weapons and Materials Research Directorate

9:20 AM

Anisotropic Mechanical Properties of Commercially Pure Aluminum Processed by Equal Channel Angular Extrusion: *Pei-Ling Sun*¹; Sheng-Jie Huang¹; Chung-Yi Yu²; Po-We Kao³; ¹Feng Chia University; ²China Steel Corporation; ³National Sun Yat-Sen University

9:35 AM Invited

Tensile Properties and Fracture Mechanisms of Ultrafine Cu Alloys Subjected to Severe Plastic Deformation: *Zhefeng Zhang*¹; P. Zhang¹; X. H. An¹; Y. Z. Tian¹; S. D. Wu¹; T. G. Langdon²; ¹Institute of Metal Research; ²University of Southern California

9:55 AM

Microstructure and Tensile Strength of Grade 2 Ti Processed by Equal-Channel Angular Pressing and Cold Rolling: *Vitor Sordi*¹; Megumi Kawasaki²; Maurizio Ferrante¹; Terence Langdon²; ¹Federal University of Sao Carlos; ²University of Southern California

10:10 AM

Strain Rate Sensitivity of Ultrafine Grained and Nanocrystalline Metals via Instrumented Nanoindentation: *Ivan Romero*¹; L. J. Kecskes²; Suveen Mathaudhu³; Qiuming Wei¹; ¹University of North Carolina at Charlotte; ²U.S. Army Research Laboratory; ³Army Research Office

10:25 AM Break

10:40 AM Invited

Ductility and Strategies for Improving Ductility of Bulk Nanostructured Materials: *Yonghao Zhao*¹; ¹Nanjing University of Science and Technology

11:00 AM

True Stress-True Strain Relationships until just before Fracture of Ultrafine-Grained Ferrite-Cementite Steels: *Noriyuki Tsuchida*¹; Tadanobu Inoue²; ¹University of Hyogo; ²National Institute for Materials Science

11:15 AM

Micromechanical Testing of Nanocrystalline and Ultra Fine Grained bcc Metals: *Jonathan Ligda*¹; Brian Schuster²; Qiuming Wei¹; ¹UNC Charlotte; ²Army Research Laboratory

11:30 AM

The Effect of High Strain Rate on the Mechanical Properties of Nanoporous Metal: *Tanvir Ahmed*¹; Alan Jankowski¹; ¹Texas Tech University

11:45 AM

Influence of Cryogenic Processing on the Mechanical Properties of High-Purity Copper: *Joel House*¹; James O'Brien²; Philip Flater¹; Robert De Angelis³; Richard Harris¹; Michael Nixon¹; ¹Air Force Research Laboratory; ²O'Brien and Associates; ³University of Florida

12:00 PM

Occurrence and Elimination of Yield Point Phenomena in Nanostructured Metals: *Xiaoxu Huang*¹; Jacob Kidmose¹; Tianlin Huang²; Qingshan Dong²; Niels Hansen¹; ¹Risø National Laboratory for Sustainable Energy, Technical University of Denmark; ²Chongqing University

Ultrafine Grained Materials VII: Thermal Stability

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee

Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Xiaoxu Huang, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; Hyoung Seop Kim, POSTECH; Terence Langdon, University of Southern California; Terry Lowe, Manhattan Scientifics, Inc.; Ruslan Valiev, Ufa State Aviation Technical University; Xiaolei Wu, Institute of Mechanics, Chinese Academy of Sciences; Michael Zehetbauer, University of Vienna

Tuesday AM
March 13, 2012

Room: Swan 5
Location: Swan Resort

Session Chairs: Kristopher Darling, U.S. Army Research Laboratory; Radomir Kuzel, Charles University; Christopher Saldana, Pennsylvania State University; Tianbo Yu, Risø National Laboratory for Sustainable Energy, Technical University of Denmark

8:30 AM Invited

Stability and Microstructural Evolution of Grain Boundaries in Severely Deformed Metals: *Gerhard Wilde*¹; Sergiy Divinski¹; Harald Rösner¹; ¹University of Muenster

8:50 AM

Thermal Stability in Nanostructured fcc Metals: The Role of Twin Interfaces and Vacancies: *Christopher Saldana*¹; Alexander King²; Srinivasan Chandrasekar³; ¹Pennsylvania State University; ²US Department of Energy, Ames Laboratory; ³Purdue University

9:05 AM

X-Ray Diffraction Study of Thermal Stability of Several Materials Prepared by ECAP and HPT: *Radomir Kuzel*¹; Zdenek Matej¹; Milos Janacek¹; Ondrej Srba¹; ¹Charles University in Prague, Faculty of Mathematics and Physics

9:20 AM Invited

Stabilization and Mechanical Properties of Nano-Crystalline Copper by Alloying with Tantalum: *Kris Darling*¹; Laszlo Kecskes¹; David Foley²; Suveen Mathaudhu³; ¹ARL; ²Texas A&M University; ³ARO

9:40 AM

Stability and Grain Growth Mechanisms in Sintered Tungsten: *Brady Butler*¹; James Paramore¹; Kristopher Darling¹; Micah Gallagher¹; Eric Klier¹; Heidi Maupin¹; ¹U.S. Army Research Laboratory

9:55 AM

Processing and Thermal Stability of Nanocrystalline Tungsten Alloys: *Tongjai Chookajorn*¹; Christopher Schuh¹; ¹Massachusetts Institute of Technology

10:10 AM

The Effect of Deformation Texture on the Thermal Stability of UFG HSLA Steel: *Enrico Bruder*¹; ¹TU Darmstadt

10:25 AM Break

10:40 AM Invited

GB Segregations in UFG Alloys Processed by SPD: *Xavier Sauvage*¹; Nariman Enikeev²; Julia Ivanisenko³; Artur Ganeev²; Ruslan Valiev²; ¹University of Rouen, CNRS; ²IPAM-USATU; ³INT - Karlsruher Institut für Technologie (KIT)

11:00 AM

Low-Temperature Thermal Stability of Cold-Rolled Nanostructured Aluminum: *Tianbo Yu*¹; Niels Hansen¹; Xiaoxu Huang¹; ¹Risø National Laboratory for Sustainable Energy, Technical University of Denmark

11:15 AM

Conditions for Stabilization of Binary Nanocrystalline Alloys against Grain Growth and Phase Separation: *Heather Murdoch*¹; Chris Schuh¹; ¹MIT

11:30 AM Invited

Enhancement of Strength and Stability of Nanostructured Ni by Small Amount of Solutes: *Hongwang Zhang*¹; Ke Lu¹; Reinhard Pippan²; Xiaoxu Huang³; Niels Hansen³; ¹Institute of Metal Research; ²Austrian Academy of Science; ³Risø National Laboratory for Sustainable Energy

11:50 AM

Processing of Thermally Stable, Ultrahigh-Strength Mg-Alloys: Kristopher Darling¹; Laszlo Kecskes²; *Suveen Mathaudhu*²; ¹U.S. Army Research Laboratory; ²U.S. Army Research Office

12:05 PM

Applying Equilibrium Segregation Theories to Inhibiting Grain Growth: *Brian VanLeeuwen*¹; ¹The Pennsylvania State University

12:20 PM

High-Pressure Torsion-Induced Grain Refinement/Growth in Coarse-Grained/Nanocrystalline Cu Powders: *Haiming Wen*¹; Troy Topping¹; Enrique Lavernia¹; Rinat Islamgaliev²; Ruslan Valiev²; ¹University of California, Davis; ²Ufa State Aviation Technical University

2012 Functional and Structural Nanomaterials: Fabrication, Properties, Applications and Implications: 1-Dimensional Nanomaterials and ZnO

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Jiyoung Kim, University of Texas; David Stollberg, Georgia Tech Research Institute; Seong Jin Koh, University of Texas at Arlington; Nitin Chopra, The University of Alabama; Terry Xu, UNC Charlotte

Tuesday PM

Room: Pelican 1

March 13, 2012

Location: Swan Resort

Session Chair: Seung Hyuck Kang, Qualcomm

2:00 PM Invited

Energy Generation and Storage Applications of TiO₂ Nanotubular Arrays by Atomic Layer Deposition and Nanotemplating: *Hyunjung Shin*¹; ¹Kookmin University

2:35 PM

High Performance TiO₂ Nanotubes-Based Biosensors for Streptavidin Detection: *Mingun Lee*¹; Antonio Lucero¹; Taewook Kim¹; Jie Huang¹; Moon Kim¹; Jiyoung Kim¹; ¹University of Texas at Dallas

2:55 PM

Nano Boron Carbide in Fabric for Improvement of Ballistic Performance: David Stollberg¹; *Juan Aguilar*¹; ¹Georgia Tech Research Institute

3:15 PM

Size Dependent Transition of Deformation Mode in Gold Nanowire: A Molecular Dynamics: *Pil Ryung Cha*¹; Na-Young Park¹; Ho-Seok Nam¹; Seung-Cheol Lee²; ¹Kookmin University; ²Computational Science Research Center, Korea Institute of Science and Technology

3:35 PM

Synthesis and Investigation of Growth Mechanisms of Functional Inorganic Oxide Nanomaterials: *Yuanbing Mao*¹; ¹University of Texas-Pan American

3:55 PM Break

4:10 PM

Ultrafine ZnO Nanoparticles Synthesized by Ultraviolet Decomposition Process in Ambient Air: Growth Mechanism and Photoresponsive Activities: *Jyh Ming Wu*¹; Hsin-Hsien Yeh²; Hong-Ching Lin²; ¹Feng Chia University; ²Industrial Technology Research Institute

4:30 PM

P-Type Conductive Behaviors of AlN Co-Doped ZnO Films Deposited by the Atomic Layer Deposition: *Yu-Mi Kim*¹; Kwang-Seok Jeong¹; Ho-Jin Yun¹; Seung-Dong Yang¹; Sang-Youl Lee¹; Hi-Deok Lee¹; Ga-Won Lee¹; ¹Chungnam National Univ.

4:45 PM

Zinc Oxide Nanorods by the Pulsed Plasma in Liquid and Their Photocatalytic Property: *Emil Omurzak*¹; Kengo Taniguchi²; Tsutomu Mashimo²; ¹Kumamoto University; ²Kumamoto University

5:05 PM

ZnO Nanowires Grown on ZnO Thin Film Deposited by Atomic Layer Deposition: *Mikhail Ladanov*¹; Paula Algarin Amaris¹; Pedro Villalba¹; Garrett Matthews¹; Manoj Ram¹; Jing Wang¹; Ashok Kumar¹; ¹University of South Florida

5:20 PM

Deposition of Organic and Inorganic Hybrid Laminates Using Ozone Based Atomic Layer Deposition: *Sunwoo Lee*¹; Jie Huang¹; Mingun Lee¹; Pil-Ryung Cha¹; Jiyoung Kim¹; ¹The University of Texas at Dallas

2012 Symposium on Surfaces and Heterostructures at Nano- or Micro-Scale and Their Characterization, Properties, and Applications: Energy and Catalysis

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Energy Conversion and Storage Committee, TMS: Nanomaterials Committee, TMS: Surface Engineering Committee, TMS: Young Leaders Committee, TMS: EMPMD Council

Program Organizers: Nitin Chopra, The University of Alabama; Ramana Reddy, The University of Alabama; Arvind Agarwal, Florida International University; Sandip Harimkar, Oklahoma State University; Jiyoung Kim, University of Texas at Dallas; Christopher Matranga, National Energy Technology Laboratory

Tuesday PM

Room: Pelican 2

March 13, 2012

Location: Swan Resort

Session Chairs: Christopher Matranga, National Energy Technology Laboratory (NETL); Paul Ohodnicki, National Energy Technology Laboratory (NETL); Nitin Chopra, The University of Alabama

2:00 PM Invited

Characterization and Modeling of 3D Photovoltaics: *Jonathan Guyer*¹; Daniel Josell¹; ¹NIST

2:35 PM Invited

More Efficient Polymer Solar Cells by Doping with Ferroelectric Dipoles: Kanwar Nalwa¹; John Carr¹; Rakesh Mahadevapuram¹; Hari Kodali¹; Baskar Ganapathysubramanian¹; *Sumit Chaudhary*¹; ¹Iowa State University



TMS 2012

141st Annual Meeting & Exhibition

TUESDAY PM

3:10 PM Break

3:15 PM

Effect of Annealing and Additives on Defects and Recombination in Polymer Photovoltaic Layers: Yuqing Chen¹; Rakesh Mahadevapuram¹; *Sumit Chaudhary*¹; ¹Iowa State University

3:35 PM Invited

Raman Studies of Hybrid Nanostructures for Solar Energy Applications: *Sonal Padalkar*¹; KunHo Yoon²; Lincoln Lauhon²; ¹Northwestern University ; ²Northwestern University

4:10 PM Invited

Developing Titania/Ferroelectric Heterostructures for Solar Photolysis: *Gregory Rohrer*¹; Paul Salvador¹; Li Li¹; Andrew Schultz¹; Yiling Zhang¹; ¹Carnegie Mellon University

4:45 PM

Photocatalytic Activity of Heterostructured Powders: Nanostructured TiO₂ Shells Surrounding Microcrystalline (Ba,Sr, Pb)TiO₃ Cores: *Li Li*¹; Paul Salvador¹; *Gregory Rohrer*¹; ¹CMU

5:05 PM Invited

Deactivation Mechanism and Hole Scavenging in Heterostructured Visible Light Active CO₂ Photoreduction Catalysts: *Christopher Matranga*¹; Congjun Wang¹; Robert Thompson¹; Paul Ohodnicki¹; ¹US DOE- NETL

5:40 PM

Multicomponent Metal-Carbon Junctions in 1-D Geometry: *Junchi Wu*¹; Paaras Agrawal²; Nitin Chopra¹; ¹The University of Alabama; ²Northridge High School

3rd International Symposium on High Temperature Metallurgical Processing: Alloy and Materials Preparation

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Energy Committee, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Patrick Masset, TU Freiberg; Onuralp Yucel, Istanbul Technical University; Rafael Padilla, University of Concepcion; Guifeng Zhou, Wuhan Iron and Steel

Tuesday PM

March 13, 2012

Room: Southern II

Location: Dolphin Resort

Session Chairs: Rafael Padilla, University of Concepcion; Jianliang Zhang, University of Science and Technology Beijing

2:00 PM

Future Considerations for Further Processing of Cobalt Alloy at Nchanga Smelter: *Humphrey Chikashi*¹; Credo Ng'uni¹; ¹Konkola Copper Mines

2:15 PM

Improving Hot Workability of Ledeburitic Tool Steels: Matevz Fazarinc¹; Goran Kugler¹; Iztok Perus¹; *Milan Tercelj*¹; ¹University of Ljubljana

2:30 PM

Influence of Elements Segregation on Creep Properties of A Single Crystal Nickel-Based Superalloy: *Chao Zhang*¹; Sugui Tian¹; Xingfu Yu¹; Zheng Zeng¹; Chen Liu¹; ¹Shenyang University of Technology

2:45 PM

Preparation of High Titanium Ferrous with Low Oxygen Content Prepared by Enhanced Reduction: Zhang Ting'an¹; *Dou Zhihe*¹; Niu Liping¹; Zhang Hanbo¹; Lv Guozhi¹; Liu Yan¹; Li Yan¹; He Jicheng¹; ¹Northeastern University

3:00 PM

Preparing Aluminum-Scandium Alloys Using Direct Hall Reduction Process: *Chunyang Gruan*¹; Jilai Xue¹; ¹University of Science and Technology Beijing

3:15 PM

Production of Fe-Cr-Ni-Ti Alloys by Metallothermic Processes: *Cem Colakoglu*¹; Onuralp Yücel²; ¹Istanbul Technical University; ²Istanbul Technical University

3:30 PM Break

3:40 PM

Production of NbAl₃ Powders through Sodium Reduction of Oxides in Molten Salts: *Chao Du*¹; Na Wang¹; Yao Zhang¹; Shuqiang Jiao¹; Hongmin Zhu¹; ¹University of Science & Technology Beijing

3:55 PM

Recrystallization of L-605 Cobalt Superalloy during Hot-Working Process: *Julien Favre*¹; Yuichiro Koizumi¹; Akihiko Chiba¹; Damien Fabregue²; Eric Maire²; ¹IMR Tohoku University; ²INSA de Lyon

4:10 PM

Research on Inclusions in CuCr Alloy Prepared by Thermit Reduction: *Dou Zhihe*¹; Zhang Ting'an¹; Zhang Zhiqi¹; Niu Liping¹; Lv Guozhi¹; Liu Yan¹; He Jicheng¹; ¹Northeastern University

4:25 PM

Settling of Inclusions in Top-cut SoG-Si Scraps under Electromagnetic Field: *Lucas Damaoh*¹; Lifeng Zhang¹; ¹Missouri University of Science and Technology

4:40 PM

Study and Application of the Taphole Clay with High Strength and Friendly Environmental Surroundings in a New Blast Furnace with 3800M3 Volume: *Guotao Xu*¹; Yue Wang¹; Yafei Xiong¹; Huaiyuan Li¹; Shuzhong Li¹; ¹Wuhan Iron and Steel Group Company

Advances in Surface Engineering: Alloyed and Composite Coatings: Session IV

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee

Program Organizers: Sandip Harimkar, Oklahoma State University; Srinivasa Bakshi, Indian Institute of Technology Madras; Arvind Agarwal, Florida International University

Tuesday PM

March 13, 2012

Room: Macaw 1

Location: Swan Resort

Session Chair: To Be Announced

2:00 PM

The Roles of Diffusion Factors in Electrochemical Corrosion of TiN and CrN (CrSiCN) Coated Mild Steel and Stainless Steel: *Feng Cai*¹; Qi Yang²; Xiao Huang¹; ¹Carleton University; ²National Research Council Canada

2:20 PM

Effect of Electroplating Parameters on "HER" Current Density in Ni-MoS₂ Composite Plating: *Ebru Saraloglu Guler*¹; Ishak Karakaya¹; Erkan Konca²; ¹Middle East Technical University; ²Atilim University

2:40 PM

Production of Ceramic Layers on Aluminum Alloys by Plasma Electrolytic Oxidation in Alkaline Silicate Electrolytes: *Alex Lugovskoy*¹; *Aleksey Kossenko*¹; *Barbara Kazanski*¹; *Michael Zinigrad*¹; ¹Ariel University Center of Samaria

3:00 PM Break

3:15 PM

Wear Properties of Plasma Sprayed Y-PSZ Coated 6063 Aluminum Alloy: *Eray Erzi*¹; *Selim Yildirim*¹; *Suat Yilmaz*¹; ¹Istanbul University

3:35 PM

Slurry Erosion Behavior of Thermally Sprayed Cr₃C₂-NiCr Coatings: *V. N. Shukla*¹; *R. Jayaganthan*¹; *B. V. Manoj Kumar*¹; *V. K. Tewari*¹; ¹IIT ROORKEE

3:55 PM

The Electrochemical Behavior of Surgical Grade 316L SS with and without HA Coatings in Simulated Body Fluid: *Tejinder Singh*¹; *Harjinder Singh*²; *Hazoor Singh*³; *Harpreet Saheer*⁴; ¹Gulzar Institute of Engineering & Technology, Ludhiana, Punjab, India; ²Govt Medical College; ³Yadvindra College of Engineering, Talwandi Sabo, Bathinda, Punjab, India; ⁴Indian Institute of Technology Ropar

4:15 PM

Modification Research on the Influence on Corrosion Film Properties of Pb-Ca-Sn Alloys of with Addition of Bi, Ag and Zn: *Lei Xu*¹; *Li Jun Liu*¹; *Pei Xian Zhu*¹; ¹Kunming University of Science and Technology

Alumina and Bauxite: Hydrate Precipitation, Calcination and Environment

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Benny Raahaage, FLSmidth

Tuesday PM
March 13, 2012

Room: Northern E3
Location: Dolphin Resort

Session Chair: Hans-Werner Schmidt, Outotech GmbH

2:00 PM

Growth and Agglomeration of Boehmite in Sodium Aluminate Solutions: *Wang Zhi*¹; *Zhang Juan*¹; *Xu Rongguang*¹; *Guo Zhancheng*¹; ¹Institute of Process Engineering

2:15 PM

Physical Simulation on Mixing Uniformity in Seed Precipitation Tank: *Liu Yan*¹; *Zhao Hongliang*¹; *Zhang Ting'an*¹; *Zhao Qiuyue*¹; *Wang Shuchan*¹; *Gu Songqing*¹; *He Jicheng*¹; *Zhang Chao*¹; ¹Northeastern University

2:30 PM

Kinetics of Boehmite Precipitation from Supersaturated Sodium Aluminates Solutions with Ethanol-Water Solvent: *Wang Zhi*¹; *Xu Rongguang*¹; *Liu Yang*¹; *Guo Zhancheng*¹; ¹Institute of Process Engineering

2:45 PM

Effect of Crystal Growth Modifier on the Structure of Sodium Aluminate Liquors Analyzed by Raman Spectroscopy: *Jianguo Yin*¹; *Wangxing Li*²; *Zhanwei Liu*²; *Zhaohui Su*²; *Zhonglin Yin*²; *Wentang Xia*¹; ¹Chongqing University of Science and Technology; ²Zhengzhou Research Institute of Chalco

3:00 PM

Precipitation Area Upgrade at ETI Aluminum: *Murat Kayaci*¹; *Bekir Çelikel*¹; *Gokhan Kursat Demir*¹; *Meral Baygöl*¹; *Carlos Suarez*²; ¹Eti Aluminyum; ²Hatch

3:15 PM

Flash -and CFB Calciners, History and Difficulties of Development of Two Calcination Systems: *Hans-Werner Schmidt*¹; *Fred Williams*²; ¹Outotec GmbH; ²CMIS Corporation

3:30 PM

A Specific Critical Analysis on the Life Time of Alumina Calciners Refractories: *Bruno Teider*¹; *Bruce Graham*²; *Jorge Gallo*¹; *Victor Pandolfelli*³; ¹Research, Development and Innovation - Alcoa LA&C; ²Alcoa World Alumina, Point Comfort Refinery, USA; ³Materials Microstructural Engineering Group - Federal University of São Carlos - Brazil

3:45 PM

The Key Technologies of Energy Efficient Al (OH) 3 Dilute Phase Fluidized Roasting Furnaces: *Li Zhaoxia*¹; *Huang He*²; *Xue Xin*³; *Li Xiuju*¹; *Wang Huan*¹; *Huang Xingyuan*³; ¹Luoyang Luohua Power Engineering and Special Refractory Materials Co., Ltd., Henan, China; ²Luoyang Luohua Ceramic Co., Ltd., Henan, China; ³Henan University of Science and Technology, Henan, China

4:00 PM

Fabric Filter Operating Results with 10 m Long Bags and Low Purging Pressures: *Carl-Vilhelm Rasmussen*¹; ¹FLSmidth

4:15 PM

Optimization of Preparation for a-Alumina by Calcination from Aluminum Hydroxide Using Response Surface Methodology: *Bin Zhang*¹; *Jinhui Peng*¹; *Libo Zhang*¹; *Shaohua Ju*¹; ¹Kunming University of Science and Technology

4:30 PM

Customer Impacts of Na₂O and CaO in SGA: *Stephen Lindsay*¹; ¹Alcoa, Inc.

4:45 PM

Options for Joint Ventures: *Anthony Kjar*¹; ¹Gibson Crest Pty Ltd

Aluminium Processing: Casting

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Processing Committee
Program Organizers: Kai Karhausen, Hydro Aluminium Rolled Products GmbH; Edward Williams, Alcoa

Tuesday PM
March 13, 2012

Room: Europe 1
Location: Dolphin Resort

Session Chair: Edward Williams, Alcoa

2:00 PM Introductory Comments

2:05 PM

Fabrication of Porous Aluminum with Directional Pore Aligned in One Direction: *Takuya Ide*¹; *Yutaro Iio*¹; *Hideo Nakajima*¹; ¹Osaka University

2:25 PM

A New Counter Gravity Sand Process Used for Aluminum Alloy Casting: *Jianmin Zeng*¹; ¹Guangxi University



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2:45 PM Question and Answer Period

2:55 PM Break

3:20 PM

The In-Situ Technique for Preparing Al-TiB₂ and Al-Al₃Ti Composites with ESR: *Jun Wang*¹; Pan Li¹; Chong Chen¹; Jin Xue¹; ¹Shanghai Jiaotong University

3:40 PM

Grain Refinement of Al Alloys by Heterogeneous Nucleation of Consumable Ultrasound Horn: *Jeong-Il Youn*¹; Young-Ki Lee¹; Bong-Jae Choi¹; Young-Jig Kim¹; ¹Sungkyunkwan University

4:00 PM

The Development and Validation of a New Thermodynamic Database for Aluminium Alloys: A Markström¹; Y Du²; S. H. Liu²; L. J. Zhang²; L Kjellqvist¹; J Bratberg¹; *Paul Mason*³; A Engström¹; Q Chen¹; ¹Thermo-Calc Software AB; ²Central South University; ³Thermo-Calc Software Inc.

4:20 PM

Effect of Solid Particles on Fluidity of Semi-Solid Aluminum Alloy Slurry: *Yuichiro Murakami*¹; Kenji Miwa²; Masayuki Kito³; Takashi Honda³; Keigo Yorioka³; Naoyuki Kanetake⁴; Shuji Tada⁴; ¹Advanced Industrial Science and Technology; ²Aichi Science and Technology Foundation; ³Aisan Industry Co., Ltd.; ⁴Nagoya University

4:40 PM Question and Answer Period

Aluminum Alloys: Fabrication, Characterization and Applications: Solutioning and Aging Behaviours

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Processing Committee
Program Organizers: Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum

Tuesday PM
March 13, 2012

Room: Northern E1
Location: Dolphin Resort

Session Chair: Tongguang Zhai, University of Kentucky

2:00 PM

Precipitation Processes in Aged Al-4.0Mg-1.5Cu-(Ge,Si) Alloys: *Junhai Xia*¹; Zhiguo Chen²; Gang Sha¹; Simon Ringer¹; ¹The University of Sydney; ²Central South University

2:20 PM

The Role of Co-Clusters in the Artificial Aging of AA6061 and AA6060: *Stefan Pogatscher*¹; Helmut Antrekowitsch¹; Thomas Ebner²; Peter Uggowitzer³; ¹Montanuniversitaet Leoben; ²AMAG Rolling GmbH; ³ETH Zurich

2:40 PM

Co-Clusters in Al Alloys: Alloy Strengthening and Thermodynamics: *Marco Starink*¹; ¹University of Southampton

3:00 PM

The Effects of Aging Treatment and Environment on the Stress Corrosion Cracking Susceptibility of AA6005A Extrusions: *Dan Seguin*¹; Calvin White¹; Richard Dickson²; ¹Michigan Technological University; ²Hydro Aluminum

3:20 PM

Nature of Grain Boundary Precipitates and Stress Corrosion Cracking in Al-7075: *Ramasis Goswami*¹; Ronald Holtz²; ¹SAIC/Naval Research Laboratory; ²Naval Research Laboratory

3:40 PM

Precipitation of the γ' (AlAg)₃ Phase on Dislocation Loops in Al-Ag(-Cu) Alloys: *Julian Rosalie*¹; Laure Bourgeois²; Barrington Muddle²; ¹National Institute for Materials Science; ²Monash University

4:00 PM Break

4:15 PM

On Elastic Compressive Stress Aging of an AA7075 Aluminum Alloy: *Jingwu Zhang*¹; Wei Guo¹; Hui Li¹; Men Yang¹; Tiankai Yao¹; Xiyu Wen²; ¹Yanshan University; ²University of Kentucky

4:35 PM

Influence of Mn in Solid Solution in Softening of AA3003 Alloy During Annealing: *Dionisios Spathis*¹; John Tsiros²; ¹Hellenic Aluminium industry (ELVAL SA); ²Hellenic Aluminium Industry (ELVAL SA)

4:55 PM

The Influence of Solution-Treatment on the High-Temperature Strength of Al-Si Foundry Alloys with Ni: *Florian Stadler*¹; Helmut Antrekowitsch¹; Werner Fragner²; Helmut Kaufmann³; Peter J. Uggowitzer⁴; ¹University of Leoben; ²AMAG Casting GmbH; ³Austria Metall GmbH (AMAG); ⁴ETH Zurich

5:15 PM

The Effect of Artificial Aging Treatment on Microstructure and Tensile Properties of Al-12.7Si-0.7Mg Alloy: *Fang Liu*¹; Fuxiao Yu¹; Dazhi Zhao¹; Liang Zuo¹; ¹Northeastern University

Aluminum Reduction Technology: Anode Effect, Process Control

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Olivier Martin, Rio Tinto Alcan

Tuesday PM
March 13, 2012

Room: Southern III
Location: Dolphin Resort

Session Chair: Claude Ritter, Rio Tinto Alcan

2:00 PM

Latest Results from PFC Investigation in China: *Xiping Chen*¹; Wangxing Li¹; Jianhong Yang¹; ¹Zhengzhou Research Institute of Chalco

2:20 PM

Studies of Perfluorocarbon Formation on Anodes in Cryolite Melts: *Ole Kjos*¹; Thor Anders Aarhaug¹; Egil Skybakmoen¹; Asbjorn Solheim¹; ¹SINTEF

2:40 PM

Characteristics of In Situ Alumina PID Ore Feed Control: *Michael Schneller*¹; ¹Consultant

3:00 PM

Towards On-Line Monitoring of Alumina Properties at a Pot Level: *Jayson Tessier*¹; Gary Tarcy¹; Eliezer Batista¹; Xiangwen Wang¹; ¹Alcoa

3:20 PM Break

3:40 PM

Controlling the Variability of Pots KPVs : The Variability Matrix: *Pierre Baillot*¹; Jean-Paul Aussel¹; Armand de Vasselot²; ¹I.P.I.; ²Optimprocess

4:00 PM

Multivariate Statistical Investigation of Carbon Consumption for HSS Reduction Cell: *Peter Polyakov*¹; Tatyana Piskazhova¹; Nikita Sharypov¹; Alexandr Krasovitskiy²; Sergey Sorokin²; ¹Siberian Federal University; ²RUSAL Nadvoitsy aluminium smelter

TUESDAY PM

4:20 PM

Experiences with Alstom's New Alfeed System at Emal: *Sivert Ose*¹; Bjørn Leikvang¹; Sunny John Mathew²; Geir Wedde¹; Anders Sorhuus¹; Odd Edgar Bjarnø¹; ¹Alstom Norway; ²Emirates Aluminium

4:40 PM

Computer Algorithm to Predict Anode Effect Events: *Fernando Costa*¹; Leonardo Paulino¹; ¹Alcoa/Alumar

Aluminum Reduction Technology: Cell Fundamentals, Phenomena and Alternatives I

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee

Program Organizer: Olivier Martin, Rio Tinto Alcan

Tuesday PM
March 13, 2012

Room: Northern E4
Location: Dolphin Resort

Session Chair: Michel Reverdy, Dubai Aluminium

2:00 PM

Effect of Current Density and Phosphorus Impurities on the Current Efficiency for Aluminum Deposition in Cryolite-Alumina Melts in a Laboratory Cell: *Gudrun Saevarsdottir*¹; Geir Haarberg²; Rauan Meirbekove¹; ¹Reykjavik University; ²Norwegian University of Science and Technology

2:20 PM

A Thermodynamic Approach to the Corrosion of the Cathode Refractory Lining in Aluminium Electrolysis Cell: Modelling of the Al_2O_3 - Na_2O - SiO_2 - AlF_3 - NaF - SiF_4 System: *Guillaume Lambotte*¹; Patrice Chartrand¹; ¹CRCT, Ecole Polytechnique de Montréal

2:40 PM

Influence of the Sulphur Content in the Anode Carbon in Aluminium Electrolysis - a Laboratory Study: *Stanislaw Pietrzyk*¹; Jomar Thonstad²; ¹AGH University of Science and Technology; ² Norwegian University of Science and Technology

3:00 PM

Concentration Gradients of Individual Anion Species in the Cathode Boundary Layer of Aluminium Reduction Cells: *Asbjorn Solheim*¹; ¹SINTEF

3:20 PM

Electrochemical Behaviour of Carbon Anodes in Na_3AlF_6 - K_3AlF_6 -Based Low-Melting Electrolytes for Aluminium Electrolysis: *Guihua Wang*¹; Xiaofei Sun¹; Wenyan Zhao¹; Dandan Yang¹; ¹University of Science and Technology Beijing

3:40 PM Break

4:00 PM

Operating Parameters of Aluminum Electrolysis in a KF - AlF_3 Based Electrolyte: *Olga Tkacheva*¹; John Hryn¹; Jeff Spangenberg¹; Boyd Davis²; Tom Alcorn³; ¹ANL; ²KPM; ³Noranda Aluminum

4:20 PM

Effect of KF Additions in NA_3ALF_6 - AL_2O_3 Electrolytes on Expansion of Cathode Blocks: Zhang Yuehong¹; Feng Naixiang¹; Peng Jianping¹; Wang Yaowu¹; Han Yeyu¹; Zhai Xiujin¹; ¹Northeastern University

4:40 PM

Preparing Aluminium-Scandium Inter-alloys during Reduction Process in KF - AlF_3 - Sc_2O_3 Melts: *Qiaochu Liu*¹; Jilai Xue¹; Jun Zhu¹; Chunyang Guan¹; ¹University of Science and Technology Beijing

5:00 PM

Liquidus Temperatures of the System Na_3AlF_6 - K_3AlF_6 - AlF_3 : Lai Yanqing¹; Xin Pengfei¹; Tian Zhongliang¹; Wei Chenjuan¹; Chen Duan¹; Li Jie¹; ¹Central South University

Atomistic Effects in Migrating Interphase Interfaces - Recent Progress and Future Study: Interface Migration and Alloy Partitioning

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Tadashi Furuhashi, Institute for Materials Research, Tohoku University; Sudarsanam Babu, Ohio State University; Hatem Zurob, McMaster University; Jian-Feng Nie, Monash University; Wen-Zheng Zhang, Tsinghua University; James Howe, University of Virginia

Tuesday PM
March 13, 2012

Room: Europe 3
Location: Dolphin Resort

Session Chairs: Hatem Zurob, McMaster University; Amy Clarke, Los Alamos National Laboratory

2:00 PM Invited

Partitioning and Austenite Reversion at Martensite-Austenite Interfaces in Mn-Steels: *Dierk Raabe*¹; Dirk Ponge¹; Gerhard Inden¹; Julio Millán¹; Pyuck-Pa Choi¹; ¹Max-Planck-Institut

2:30 PM

Ferrite-to-Austenite and Austenite-to-Ferrite Phase Transformation in a Fe-2 wt% Mn Alloy Studied In-Situ with 3DXRD Utilizing Synchrotron Radiation: *Hemant Sharma*¹; Richard Huizenga¹; Jilt Sietsma¹; S. Erik Offerman¹; ¹Delft University of Technology

3:00 PM

Transitions in Austenite Decomposition Products in a Fe-10%Ni/Fe-5%Ni Diffusion Couple with 0.1%C and 0.3%C: *Eduardo Monlevade*¹; Arthur Nishikawa²; Helio Goldenstein²; ¹Mangels Indústria e Comércio Ltda. - Steel Division; ²Engineering School - University of São Paulo

3:20 PM

New Observation of PE Kinetics in Fe-C-X and Fe-N-X Systems: *Mingxing Guo*¹; Catherine Silva¹; Hatem Zurob¹; ¹McMaster University

3:40 PM Break

4:00 PM Invited

Analysis at the Nanoscale of the Austenite/Ferrite Interface during Ferrite Formation: *Mohamed Gouné*¹; Frederic Danoix²; ¹ArcelorMittal Maizières Research; ²CNRS - Université de Rouen

4:30 PM

Manganese Partitioning during Pearlite Growth in Fe-C-Mn Medium Carbon Steel: Maria Martin-Aranda¹; Juan Cornide¹; *Carlos Capdevila-Montes*¹; Michael Miller²; Francisca Caballero¹; Robert Hackenberg³; Esteban Urones-Garrote⁴; ¹CENIM-CSIC; ²ORNL; ³LANL; ⁴Universidad Complutense

4:50 PM

Formation of Grain Boundary Ferrite in Eutectoid and Hypereutectoid Steels: *Goro Miyamoto*¹; Yosuke Karube¹; Tadashi Furuhashi¹; ¹Tohoku University



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Biological Materials Science Symposium: Biological and Bio-Inspired Materials II: Hard Biomaterials

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Nima Rahbar, University of Massachusetts Dartmouth; Candan Tamerler, University of Washington; Po-Yu Chen, University of California, San Diego; Molly Gentleman, Texas A&M University

Tuesday PM Room: Swan 7
March 13, 2012 Location: Swan Resort

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

2:00 PM Invited

Biomimetic Scaffolds for Regeneration: *Peter Ma*¹; ¹University of Michigan

2:30 PM

Hydroxyapatite-Coated Titanium-Based Biomaterials Prepared by RF Magnetron Sputtering: *Guoqing Wang*¹; Liping Niu¹; Sheng Yang¹; TingTing Gao¹; ¹College of Science, Northeastern University

2:50 PM

Estimation of Residual Stresses in Bone Resulting from Surface Treatments: *Jose Viray*¹; Dwayne Arola¹; ¹University of Maryland Baltimore County

3:10 PM

Micro-Mechanical Characterization of Bovine Cortical Bone in Bending and Uniaxial Compression: *Kelly Kranjc*¹; Pravin Ramesh¹; Katharine Flores¹; ¹Ohio State University

3:25 PM

The Elastic Modulus of Trabecular Bone: Modeling and Experiments: Elham Hamed¹; Ekaterina Novitskaya²; Jun Li¹; Po-Yu Chen²; *Iwona Jasiuk*¹; Joanna McKittrick²; ¹University of Illinois at Urbana-Champaign; ²University of California, San Diego

3:40 PM Break

3:50 PM Invited

Adhesion in Nanoparticles for Cancer Detection and Treatment: *Winston Soboyejo*¹; ¹Princeton University

4:20 PM

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

4:40 PM

Improved Biocompatible Zirconia and Alumina Based Ceramic Composites: *Koushik Biswas*¹; Ajoy Pandey¹; ¹Indian Institute of Technology Kharagpur

5:00 PM

Effect of Bacteria on Mechanical Properties of Dental Composites: *Dmytro Khvostenko*¹; Jamie Kruzic¹; John Mitchell²; Jack Ferracane²; ¹Oregon State University; ²Oregon Health & Science University

5:15 PM

Micromechanical Analysis of Strain-Induced Martensitic Transformation in Biomedical Co-Cr-Mo-N Alloy: *Byoung-Soo Lee*¹; Shou Suzuki¹; Hiroaki Matsumoto²; Yuichiro Koizumi²; Akihiko Chiba²; ¹Department of Materials Processing, Graduate School of Engineering, Tohoku University; ²Institute for Materials Research, Tohoku University

Bulk Metallic Glasses IX: Structures and Mechanical Properties II

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

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

Tuesday PM Room: Swan 6
March 13, 2012 Location: Swan Resort

Session Chairs: A. Greer, Univ of Cambridge; J. Eckert, IFW Dresden

2:00 PM Keynote

Plastic Deformation and Structure Changes in Metallic Glasses: *A. Greer*¹; ¹Univ of Cambridge

2:30 PM

Determination of Phase Separation in Amorphous Pd(40+0.5x)Ni(40+0.5x)P(20-x) BMG for x = 0 to 4: *Man Tat Lau*¹; Si Lan¹; Yeuk Lan Yip¹; Hin Wing Kui¹; ¹Chinese University of Hong Kong

2:40 PM Invited

Properties of Shear Transformation Zones in Metallic Glasses: *Michael Atzmon*¹; JongDoo Ju¹; Dongchan Jang²; ¹University of Michigan; ²Caltech

3:00 PM

Mechanical Relaxation in Bulk Metallic Glasses: *Jichao Qiao*¹; J.M. Pelletier¹; W.H. Wang²; ¹INSA-Lyon; ²Institute of Physics, Chinese Academy of Sciences

3:10 PM

High Temperature Deformation and Twin Roll Strip Casting Ability of Cu-Zr-based Bulk Metallic Glasses: *Kwang Seok Lee*¹; Young Seon Lee¹; ¹Korea Institute of Materials Science

3:20 PM Break

3:35 PM Invited

Formation of B2 CuZr in Metastable CuZr-Based Bulk Glass Forming Alloys: K.K. Song¹; S. Pauly¹; Y. Zhang¹; P. Gargarella¹; N.S. Barekar¹; U. Kühn¹; M. Stoica¹; *J. Eckert*²; ¹IFW Dresden; ²University of Tennessee

3:55 PM

Characteristics of Metallic Glass Thin Films Deposited by Using RF, DC and Pulsed DC Sputtering Techniques: *Chia-Lin Li*¹; Jyh-Wei Lee²; Jinn Chu¹; ¹National Taiwan University of Science and Technology; ²Mingchi University of Technology

4:05 PM Invited

Structural and Mechanical Heterogeneity of Bulk Metallic Glasses: *Mingwei Chen*¹; ¹Tohoku University

4:25 PM Invited

Intrinsic Yield Strength and Elastic Strain Limit of Metallic Glasses: *Evan Ma*¹; ¹Johns Hopkins University

4:45 PM

Critical Temperature for Ductile-to-Brittle Transition for Metallic Glasses: *Golden Kumar*¹; Pascal Neibecker²; Jan Schroers¹; ¹Yale University; ²Universitaet des Saarlandes

4:55 PM Invited

Influence of Shear Band on the Mechanical Behavior of Metallic Glasses: *Yi Li*¹; ¹National University of Singapore

5:15 PM Invited

Review on the Use of Bulk Metallic Glass for Multi-Scale Tooling Applications: *David Browne*¹; Dermot Stratton¹; Michael Gilchrist¹; Cormac Byrne¹; ¹University College Dublin

5:35 PM Invited

Intrinsic and Extrinsic Size Effects in the Deformation of Metallic Glass Nanopillars: *Jeff De Hosson*¹; O. Kuzmin¹; Y.T. Pei¹; ¹Univ of Groningen

Cast Shop for Aluminum Production: Furnace

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Trond Furu, Hydro

Tuesday PM
March 13, 2012

Room: Northern A4
Location: Dolphin Resort

Session Chair: Ragnhild Aune, NTNU

2:00 PM

Automated Measurement of Furnace Liquid Metal Heel and Full Furnace Weights: *John Courtenay*¹; ¹MQP Limited

2:20 PM

Development of a New Generation Electromagnetic Metal Moving System: *Graham Guest*¹; *Stephen Augustine*¹; Fabienne Virieux²; ¹Solios Thermal; ²Fives Solios

2:40 PM

Six Years Experience from Low-Temperature Oxyfuel in Primary and Re-Melting Aluminium Cast Houses: *Henrik Gripenberg*¹; ¹Linde

3:00 PM Break

3:20 PM

Energy and Maintenance Cost Savings Review at Several US Aluminum Die Cast Manufacturers Using Unique, Non-Wetting, Micro-Porous Refractory Products: *Robert Cullen*¹; Kenneth McGowan¹; ¹Westmoreland Advanced Materials, LLC

3:40 PM

Quality Comparison between Molten Metal from Remelted Sheets; Mill Finish and Coated: *Anne Kvithyld*¹; Arne Nordmark¹; Derya Dispinar¹; ¹SINTEF

4:00 PM

Numerical Modeling of Oxy-Fuel and Air-fuel Burners for Aluminium Melting: *Jørgen Furu*¹; Andreas Buchholz²; Trond H. Bergstrøm³; Knut Marthinsen¹; ¹NTNU; ²Hydro Aluminium Deutschland GmbH; ³SINTEF Materials and Chemistry

CFD Modeling and Simulation in Materials Processing: Modeling of Casting and Solidification Processes I

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
Program Organizers: Laurentiu Nastac, The University of Alabama; Lifeng Zhang, Missouri University of Science and Technology; Brian Thomas, University of Illinois at Urbana-Champaign; Adrian Sabau, Oak Ridge National Lab ; Nagy El-Kaddah, The University of Alabama; Adam Powell, Metal Oxygen Separation Technologies, Inc.; Hervé Combeau, Institut Jean Lamour

Tuesday PM
March 13, 2012

Room: Asia 4
Location: Dolphin Resort

Session Chairs: Hervé Combeau, Institut Jean Lamour; Charles-André Gandin, Mines ParisTech

2:00 PM Keynote

Multiscale and Multiphysics Models in CFD Modeling and Simulation of Solidification Process: *Hervé Combeau*¹; Miha Založnik¹; ¹Institut Jean Lamour

2:30 PM Invited

3D CAFE Simulation of a Macro-segregation Benchmark Experiment: *Charles-André Gandin*¹; T. Carozzani¹; H. Digonnet¹; M. Bellet¹; ¹MINES ParisTech

2:55 PM Invited

Modeling of Multiscale and Multiphase Phenomena in Material Processing: *Andreas Ludwig*¹; Abdellah Kharicha¹; Menghuai Wu¹; ¹University of Leoben, Dep. Metallurgy

3:20 PM

Numerical Simulation of Macro-segregation Formation during Solidification Accounting for Inoculants and Equiaxed Grain Transport: *Knut Omdal Tveito*¹; Marie Bedel²; Miha Založnik³; Hervé Combeau³; Mohammed M'hamdi⁴; Arvind Kumar³; Pradip Dutta⁵; ¹Norwegian University of Science and Technology; ²Institut Jean Lamour, Departement SI2M, CNRS – Nancy-Université – UPV-Metz, Ecole des Mines de Nancy; ³Institut Jean Lamour, Departement SI2M, CNRS – Nancy-Université – UPV-Metz, Ecole des Mines de Nancy; ⁴SINTEF Materials and Chemistry; ⁵Department of Mechanical Engineering, Indian Institute of Science, Bangalore

3:40 PM Break

4:00 PM

A Numerical Benchmark Exercise on Thermal and Thermosolutal Natural Convection in Liquid Alloys

: *Miha Založnik*¹; Cédric Le Bot²; Stéphane Glockner²; Olga Budenkova³; Yves Du Terrail³; Marius-Vasile Bejinariu⁴; Gregor Kosec⁵; Dominique Gobin⁶; Hervé Combeau¹; ¹Institut Jean Lamour; ²I2M-TREFLE; ³SIMaP; ⁴Universitatea Tehnica de Constructii Bucuresti; ⁵Institut Jožef Stefan; ⁶EM2C

4:20 PM

2D and 3D Numerical Modeling of Solidification Benchmark of Sn-3% Pb Wt. Alloy under Natural Convection: Redouane Boussaa¹; Lakhdar Hachani¹; Bachir Saadi¹; Xiaodong Wang¹; Olga Budenkova¹; *Kader Zaidat*¹; Hamda Ben Hadid²; Yves Fautrelle¹; ¹Grenoble-INP; ²LMFA-Ecole centrale de Lyon

TUESDAY PM



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TUESDAY PM

4:40 PM

Numerical Modeling of the Interaction between a Foreign Particle and Solidifying Crystalline Interface: Eliana Agaliotis¹; Mario Rosenberger¹; Alicia Ares¹; Carlos Schvezov¹; ¹CONICET - UNAM

5:00 PM

Simulation of A356 Semi-Solid Die-Casting Using Power-Law Model: Seyed Vahidreza Seyed Vakili¹; Mahmoud Nili-Ahmadabadi¹; ¹University of Tehran

5:20 PM

Optimization of Tensile Test Pattern for Aluminum Alloys: Engin Tan¹; Freddy Syvertsen²; Derya Dispinar³; ¹Pamukkale University; ²SINTEF; ³University of Istanbul

Characterization of Minerals, Metals, and Materials: Characterization Technologies

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jiann-Yang Hwang, Michigan Technological University; Sergio Montero, State University of North Rio De Janeiro; Chenguang Bai, Chongqing University; John Carpenter, US Department of Energy; Donato Firrao, Politecnico di Torino; Byoung-Gon Kim, Korea Institute of Geoscience & Mineral Resources; Mingdong Cai, Schlumberger

Tuesday PM
March 13, 2012

Room: Asia 2
Location: Dolphin Resort

Session Chairs: Mingdong Cai, Schlumberger Inc.; John Carpenter, DOE Los Alamos National Laboratory

2:00 PM

3D Characterization of Dendrites in Synthetic and Naturally Occurring Magma: S. Knox¹; A. Shiveley²; G. Viswanathan²; M. Chapman¹; J. Hammer³; J. Tiley²; ¹Southwestern Ohio Council for Higher Education/Air Force Research Laboratory; ²Air Force Research Laboratory; ³Department of Geology and Geophysics, University of Hawaii¹

2:15 PM

3D Metallography of Multiphase Steels: Martin Fischer¹; Pierre Lutomski¹; Andreas Stieben¹; Wolfgang Bleck¹; ¹RWTH Aachen University

2:30 PM

Advantages of Integrating Precession Scanning Transmission Electron Microscopy in the Characterization of Metallic Materials: Peter Collins¹; Hamid Mohseni¹; Tom Scharf¹; ¹University of North Texas

2:45 PM

Characterization of Microstructure-Property Relations: Applying Complementary 3D Techniques: John Bingert¹; Matthew Tucker¹; Robert Suter²; Brian Patterson¹; Cheng Liu¹; ¹Los Alamos National Laboratory; ²Carnegie Mellon University

3:00 PM

Characterization of Open-Pored Metals Using Image Processing: Bjoern Hinze¹; Joachim Roesler¹; ¹TU Braunschweig

3:15 PM

Full-Field Strain Mapping of Woven Structural Composites for Aerospace Applications: Shahram Amini¹; Ellen Sun¹; ¹United Technologies Research Center

3:30 PM Break

3:40 PM

Precession Illumination Based Orientation Imaging, Grain Size and Defect Analysis in the Transmission Electron Microscope: Andreas Kulovits¹; Jorg Wiezorek¹; ¹University of Pittsburgh

3:55 PM

Micro-Channeled Materials for Acoustic Absorption Applications: Michael Culler¹; Keller Tomassi¹; Keri Ledford²; Jason Nadler²; ¹Georgia Institute of Technology; ²Georgia Tech Research Institute

4:10 PM

Surface Characterization of 19th Century and Modern Daguerreotypes Using EBSD & EDS: Lisa Chan¹; Patrick Ravines²; Bob Anderhalt¹; Rob McElroy³; Tara Nylese¹; Peter Bush²; ¹EDAX; ²SUNY Buffalo State; ³Archives Studio

4:25 PM

Measuring Crystal Elastic Constants Using Ultrafast Laser Generated Surface Acoustic Waves: Peng Zhao¹; Changdong Wei¹; Ji-Cheng Zhao¹; ¹Ohio State University

4:40 PM

Thermography Assisted Fatigue Testing: Anil Saigal¹; Rongbiao Gu¹; Christopher San Marchi²; Douglas Matson¹; ¹Tufts University; ²Sandia National Laboratory

Computational Thermodynamics and Kinetics: Diffusion Coefficients

Sponsored by: The Minerals, Metals and Materials Society, 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, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Phase Transformations Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Zi-Kui Liu, The Pennsylvania State University; Mark Asta, University of California, Berkeley; James Warren, The National Institute of Standards and Technology; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yu Wang, Michigan Tech

Tuesday PM
March 13, 2012

Room: Australia 3
Location: Dolphin Resort

Session Chairs: Anton van der Ven, U Michigan; Carelyn Campbell, NIST

2:00 PM Invited

Challenges in Constructing Diffusion Mobility Databases for Industrial Alloys: Carelyn Campbell¹; ¹National Institute of Standards and Technology

2:25 PM

Computation and Validation of Effective Diffusion Coefficient in a Magnesium Polycrystal: Bala Radhakrishnan¹; Nagraj Kulkarni¹; Yongho Sohn¹; Jerry Hunter¹; ¹Oak Ridge National Laboratory

2:40 PM

Tracer Diffusion Databases – Benefits and Techniques: Nagraj Kulkarni¹; Graeme Murch²; Irina Belova²; Yongho Sohn³; Robert Warmack¹; Jerry Hunter⁴; Bala Radhakrishnan¹; ¹Oak Ridge National Laboratory; ²The University of Newcastle; ³University of Central Florida; ⁴Virginia Polytechnic Institute and State University

2:55 PM

Extracting Chemical Diffusion Coefficients from Ternary Diffusion

Paths: *Qiaofu Zhang*¹; Ji-Cheng Zhao¹; ¹The Ohio State University

3:10 PM

Solute Diffusion in Ordered Bulk Ni₃Al: A First Principles

Investigation: *Priya Gopal*¹; Srinivasan Srivilliputhur¹; ¹University of North Texas, Denton

3:25 PM Break

3:50 PM Invited

Interstitial and Substitutional Solid-State Diffusion from First

Principles: *Anton Van der Ven*¹; ¹University of Michigan

4:15 PM

Ab Initio Determination of Point Defects and Derived Diffusion

Properties in Metals: *Tilmann Hickel*¹; ¹Max-Planck-Institut fuer Eisenforschung GmbH

4:30 PM

Diffusion of Silicon in Nickel: The Role of Stress and Its Implications

to Microstructural Evolution under Irradiation: *Venkateswara Rao Manga*¹; Pascal Bellon¹; Robert Averback¹; Dallas Trinkle¹; ¹University of Illinois at Urbana Champaign

4:45 PM

Ab-Initio Calculations of Solute Properties in Magnesium: *Liam*

*Huber*¹; Ilya Elfimov¹; Joerg Rottler¹; Matthias Militzer¹; ¹University of British Columbia

5:00 PM

Accelerated Self-Diffusion in FCC Metals Due to H Induced

Superabundant Vacancies: *Roman Nazarov*¹; Tilmann Hickel¹; Jörg Neugebauer¹; ¹Max Planck Institute for Iron Research

5:15 PM

Oxygen-Solute Interaction in α -Titanium and the Effect on Diffusion:

*Henry Wu*¹; Dallas Trinkle¹; ¹University of Illinois at Urbana-Champaign

Computational Thermodynamics and Kinetics: Phase-Field Simulations in Alloys II

Sponsored by: The Minerals, Metals and Materials Society, 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, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Phase Transformations Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Zi-Kui Liu, The Pennsylvania State University; Mark Asta, University of California, Berkeley; James Warren, The National Institute of Standards and Technology; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yu Wang, Michigan Tech

Tuesday PM
March 13, 2012

Room: Asia 5
Location: Dolphin Resort

Session Chairs: Long-Qing Chen, Penn State; John Morral, Ohio State University

2:00 PM

A Phase Field Crystal Model of Irradiation Damage in Materials:

*Nana Ofori-Opoku*¹; Jeffrey Hoyt¹; Nikolas Provatas¹; ¹McMaster University

2:15 PM

Simulating Microstructure Property Relations in Shape Memory

Polycrystals: *Rajeev Ahluwalia*¹; Siu Sin Quek¹; Wu David¹; ¹Institute of High Performance Computing

2:30 PM

Complex Microstructures Formed in $\bar{\alpha}$ + β / $\bar{\alpha}$ + $\bar{\alpha}$ ' Diffusion Couples

in Ni-Al-Cr System: Comparison of Phase Field Simulation from a Model System with Experiments: *Xiaoqin Ke*¹; John Morral¹; Yunzhi Wang¹; ¹Ohio State University

2:45 PM

Phase Field Simulations of Electromigration Driven Failure in

SnAgCu Solder Interconnects: *Subramanya Sadasiva*¹; Ganesh Subbarayan-Shastri¹; Lei Jiang²; Daniel Pantuso²; Sandeep Sane²; ¹Purdue University; ²Intel Corporation

3:00 PM

Elastic Effects on Aging in Cu/Sn-Ag-Cu Lead-Free Solder Joints:

A Phase-Field Study: *Durga Ananthanarayanan*¹; Patrick Wollants¹; Nele Moelans¹; ¹Department of Metallurgy and Materials Engineering, Katholieke Universiteit Leuven

3:15 PM

Phase-Field Crystal Modeling of Metal-on-Metal Epitaxy: Exploring

Routes to Self-Organization: *Srevasan Muralidharan*¹; Raika Khodadad¹; Ethan Sullivan¹; Mikko Haataja¹; ¹Princeton University

3:30 PM Break

4:00 PM

Numerical Modeling of Dendritic Growth During Solidification of

Alloys Using Lattice Boltzmann and Cellular Automaton Methods: *Mohsen Eshraghi*¹; Sergio Felicelli¹; ¹Mississippi State University

4:15 PM

Phase-Field Simulation of Segregation to Stacking Fault and Twin

Boundaries in Co-Based Alloys: *Yuichiro Koizumi*¹; Sho Suzuki¹; Takuma Ohtomo¹; Shingo Kurosu¹; Yungping Li¹; Hiroaki Matsumoto¹; Akihiko Chiba¹; ¹Tohoku University

4:30 PM

A Hybrid Phase-Field / Transmission Electron Microscopy Approach

for Quantifying θ ' Precipitation Kinetics in Cast Al-Si-Cu Alloys: *Junsheng Wang*¹; Ruijie Zhang²; William Donlon¹; Mei Li¹; Long-Qing Chen³; John Allison⁴; ¹Ford Motor Company; ²University of Science and Technology Beijing; ³Penn State University; ⁴University of Michigan

4:45 PM

Antiphase Boundaries in Rafted Structures: Experimental

Investigation and Phase Field Modeling: *Yann Le Bouar*¹; Adèle Lyprendi¹; Alphonse Finel¹; Jean-Sébastien Mérot¹; Loïc Patout¹; François Brisset²; ¹LEM, CNRS/ONERA; ²ICMMO, Université Paris-Sud

5:00 PM

Modeling the Kinetics of Diffusive Phase Transformations -Phase

Field Method and Thick Interface Model: *Ernst Gamsjäger*¹; Jiri Svoboda²; Franz Dieter Fischer¹; ¹Montanuniversität Leoben; ²Academy of Sciences

5:15 PM

Morphological Study of Polymer Crystallization by a Phase-Field

Model: *Mohsen Asle Zaeem*¹; Sasan Nouranian¹; Mark Horstemeyer¹; Paul Wang¹; ¹Mississippi State University



TMS 2012

141st Annual Meeting & Exhibition

Defects and Properties of Cast Metals: Solidification Structure and Segregation

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Mark Jolly, University of Birmingham; Brian Thomas, University of Illinois at Urbana-Champaign; Carl Reilly, University of British Columbia

Tuesday PM
March 13, 2012

Room: Oceanic 4
Location: Dolphin Resort

Session Chairs: Matthew Krane, Purdue University; Brian Thomas, University of Illinois

2:00 PM

A Multi-Scale 3D Model of the Vacuum Arc Remelting Process: *Koullis Pericleous*¹; Georgi Djambazov¹; Mark Ward²; Yuan Lang³; Peter Lee⁴; ¹University of Greenwich; ²University of Birmingham; ³Imperial College; ⁴University of Manchester

2:20 PM

Deterministic Origin of Dendritic Side-Branching: *Martin Glicksman*¹; ¹Florida Institute of Technology

2:40 PM

Identification of Defect Prone Peritectic Steel Grades by Analyzing the High Temperature Phase Transformations: *Peter Presoly*¹; Robert Pierer¹; Christian Bernhard¹; ¹Montanuniversitaet Leoben

3:00 PM

Effect of Deformation on Microsegregation in Cast Structure of Bearing Steel: *Mitra Basirat*¹; Hasse Fredriksson¹; ¹KTH, Royal Institute of Technology

3:20 PM

Effects of Section Size And Cooling Rate on Microstructure and As-Cast Properties of Investment Cast CO-CR Biomedical Alloy: *Ruth Kaiser*¹; David Browne¹; Kenny Williamson²; Claire O'Brien²; ¹University College Dublin; ²DePuy (Ireland)

3:40 PM Break

4:00 PM

The Influence of Cu on Eutectic Nucleation and Morphology in Hypoeutectic Al-Si Alloys: *Anilajaram Darlapudi*¹; ¹University of Queensland

4:20 PM

Molecular-Dynamics Simulations of Ni-Based Superalloys: *Christopher Woodward*¹; James Lill²; Dallas Trinkle³; Mark Asta⁴; ¹Air Force Research Laboratory; ²High Performance Technologies Inc.; ³University of Illinois; ⁴University of California

4:40 PM

Microstructure and Microsegregation in Inconel 718 Casting: *Alexis Pautrat*¹; ¹Mines Paristech

5:00 PM

Numerical Simulation on Solidification Microstructure of Cast Steel Using Cellular Automaton Method: Bin Su¹; *Zhiqiang Han*¹; Baicheng Liu¹; Yongrang Zhao²; Bingzhen Shen²; Lianzhen Zhang²; ¹Tsinghua University; ²CITIC Heavy Industries Co., Ltd.

5:20 PM

Microstructure Simulation in Pressurized Solidification during Squeeze Casting of Aluminum Alloy A356: Yanda Li¹; *Zhiqiang Han*¹; Alan Luo²; Anil Sachdev²; Baicheng Liu¹; ¹Tsinghua University; ²General Motors Global Research and Development Center

5:40 PM

Modeling of Melt Mixing Phenomena in Cast Iron with Dual Graphite Structure: Simon Lekakh¹; *Jingjing Qing*¹; Von Richards¹; ¹Missouri University of Science and Technology

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

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Light Metals Division, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Qizhen Li, University of Nevada, Reno; Fuqian Yang, Univ. of Kentucky; Ke An, Oak Ridge National Laboratory

Tuesday PM
March 13, 2012

Room: Northern A2
Location: Dolphin Resort

Session Chairs: Qizhen Li, University of Nevada, Reno; Wen-Ming Chien, University of Nevada, Reno

2:00 PM Invited

Materials Design in Magnesium Alloy Development: *Michele Manuel*¹; ¹University of Florida

2:30 PM

The Shear Localization Behavior and Mechansims of Five Light Metals: Al 7039, Al 5083, Al 5059, AZ31B, and AM60: Sara Perez-Bergquist¹; George Gray¹; *Ellen Cerreta*¹; Carl Trujillo¹; Mike Lopez¹; ¹Los Alamos National Laboratory

2:45 PM

Reducing Forming Time in Warm Forming of Lightweight Metals by Using Variable Forming Speed: *Serhat Kaya*¹; ¹The Ohio State University

3:00 PM

Influence of Size on Strength of Nickel Nanowires: *Ilaksh Adlakha*¹; Kiran Solanki²; Amitava Moitra³; Mark Tschopp⁴; ¹SEMTE; ²Arizona State University; ³Pennsylvania State University; ⁴Mississippi State University

3:15 PM

Deformation Twinning Activation of Ti-6Al-4V under Different Loading Conditions: *Ming Chu*¹; Jeremy Millett²; Yu Chiu¹; Ian Jones¹; ¹University of Birmingham; ²AWE

3:30 PM Break

3:50 PM Invited

Mechanical Properties of Bulk Nanostructured 7075 Al Alloy Prepared by Severe Plastic Deformation: *Yonghao Zhao*¹; X.Z. Liao²; T.D. Topping³; Y. Li¹; Y.T. Zhu⁴; R. Z. Valiev⁵; E.J. Lavernia¹; ¹University of California Davis; ²University of Sydney, Australia; ³University of California, Davis; ⁴North Carolina State University, Raleigh; ⁵Ufa State Aviation Technical University, Russia

4:20 PM

1100 Aluminum under Quasi-Static and Dynamic Loading: *Cyril Williams*¹; Guangli Hu²; Changqiang Chen²; Kaliat Ramesh²; Datta Dandekar¹; ¹U.S. Army Research Laboratory; ²The Johns Hopkins University

4:35 PM

Study on High Velocity and High Strain Rate Deformation of Aluminum Alloys with Electromagnetic Forming: *Jianhui Shang*¹; Steve Hatkevich¹; Larry Wilkerson¹; ¹American Trim LLC

4:50 PM

Dynamic Characterization of Open Cell Aluminium Foam Structures: *Carl Cady*¹; George Gray¹; Etienne Combaz²; Andreas Mortensen²; ¹Los Alamos National Laboratory; ²Ecole Polytechnique Federale de Lausanne

5:05 PM

Impact Deformation and Dislocation Substructure of Ti-6Al-4V Alloy at Cryogenic Temperatures: *Woei-Shyan Lee*¹; Tao-Hsing Chen¹; Sian-Cing Huang¹; ¹National Cheng Kung University

Electrode Technology for Aluminium Production: Carbon Materials for Anode and Cathode

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Morten Sorlie, Alcoa Norway

Tuesday PM
March 13, 2012

Room: Americas Seminar
Location: Dolphin Resort

Session Chair: Carlos Zangiacomi, Alcoa Aluminum Inc.

2:00 PM

Evolution of Anode Grade Calcined Coke: *Les Edwards*¹; Nigel Backhouse²; Hans Darmstadt²; Marie-Josée Dion²; ¹Rain CII Carbon; ²Rio Tinto Alcan

2:20 PM

Studies on Impact of Calcined Petroleum from Different Sources on Anode Quality: *Binuta Patra*¹; Rabindra Barik¹; ¹National Aluminium Company Ltd

2:40 PM

Prebaked Anode from Coal (3) - Carbonization Properties of Hypercoal Blended with Coal-Tar Pitch: *Maki Hamaguchi*¹; Niriya Okuyama¹; Nobuyuki Komatsu¹; Naoki Kikuchi¹; Jiro Koide²; Hideki Kasahara²; ¹Kobe Steel, Ltd.; ²Sumitomo Corporation

3:00 PM

Importance of Primary Quinoline Insoluble in Binder Pitch for Anode: *Minoru Sakai*¹; Yulong Wang¹; Takashi Fukuoka¹; Hitomi Hatano¹; ¹JFE Chemical Corporation

3:20 PM

Investigation on Air Reactivity and Electrolysis Consumption of Anode Carbons with Anthracite Additions: *Jilai Xue*¹; Meizhi Han¹; Jun Zhu¹; ¹University of Science and Technology Beijing

3:40 PM

Experiences on Anode Reconstruction Process in Soderberg Technology: *Carlos Zangiacomi*¹; Jose Luis Garcia Garcia²; Andre De Abreu¹; Ciro Kato¹; ¹Alcoa Aluminum Latin America; ²Alcoa INESPAL, S.A.

4:00 PM Break

4:10 PM

Cathode Performance Evaluation at Votorantim Metais - CBA: *Jean Pardo*¹; ¹Votorantim Metais - CBA

4:30 PM

Green, Safe and Clean Carbon Products for the Aluminium Electrolysis Pot: *Bénédicte Allard*¹; Régis Paulus¹; ¹Carbone Savoie

4:50 PM

A New Material for Collector Bar Sealing – LRM2: *Thiago Simoes*¹; Marcio Guimaraes¹; Marcelo Assuncao¹; ¹Novelis

5:10 PM

Dry Barrier Mix in Reduction Cell Cathodes: *Richard Jeltsch*¹; Chen Cairong²; ¹Jeltsch Consulting; ²Chalieco/Gami

Electrometallurgy 2012: Session III

Sponsored by: The Minerals, Metals and Materials Society, The Metallurgy and Materials Society of CIM, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee

Program Organizers: Georges Houlachi, Hydro-Quebec; Antoine Allanore, Massachusetts Institute of Technology; Michael Free, University of Utah; Michael Moats, University of Utah; Edouard Asselin, UBC; Shijie Wang, Rio Tinto Kennecott Utah Copper; James Yurko, Materion Brush Beryllium and Composites

Tuesday PM
March 13, 2012

Room: Europe 5
Location: Dolphin Resort

Session Chairs: Michael Moats, University of Utah; Edouard Asselin, University of British Columbia

2:00 PM

Capacities of Molten Slags and Their Practical Use: *Kazuki Morita*¹; ¹The University of Tokyo

2:20 PM

Investigation of Nucleation and Plating Overpotentials during Copper Electrowinning using the Galvanostatic Staircase Method: *Michael Moats*¹; Alexander Derrick¹; ¹University of Utah

2:40 PM

Nucleation and Growth of Copper on Stainless Steel Cathode Blanks in Electrorefining: *Jari Aromaa*¹; *Olof Forsén*¹; Antti Kekki¹; ¹Aalto University

3:00 PM

An Overview of the Design of the New Nickel Tankhouse at Anglo American Platinum's Base Metal Refinery: *Deborah Erasmus*¹; *Nicko Prinsloo*¹; ¹Anglo American Platinum

3:20 PM

Developments in Base Metal Electrowinning Cellhouse Design: *Tim Robinson*¹; Kathryn Sole²; Michael Moats³; Frank Crundwell⁴; Masatsugu Morimitsu⁵; Lauri Palmu⁶; ¹Republic Alternative Technologies; ²Independent Consultant; ³University of Utah; ⁴CM Solutions (Pty) Ltd; ⁵Doshisha University; ⁶Talvivaara

3:40 PM Break

3:55 PM

The Recovery of Manganese from the Boleo Project Using Leach, Precipitation and Electrolytic Manganese Metal Production: *Thomas Gluck*¹; David Dreisinger²; Jianming Lu²; ¹Baja Mining Corp.; ²Univ of B.C.

4:15 PM

Underpotential Dissolution of Precious Metals from Intermetallic Compounds with Zn: *Hideaki Sasaki*¹; Takashi Nagai¹; Masafumi Maeda¹; ¹Institute of Industrial Science, The University of Tokyo

4:35 PM

The Recovery of Cobalt from the Boleo Deposit Using Leach, SX and EW: *David Dreisinger*¹; Thomas Gluck²; Jianming Lu¹; ¹Univ of B.C.; ²Baja Mining Corp.

TUESDAY PM



TMS 2012

141st Annual Meeting & Exhibition

TUESDAY PM

Emeritus Professor George D.W. Smith Honorary Symposium: Steels II and Superalloys

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Michael Miller, Oak Ridge National Laboratory; Gregory Olson, Northwestern University and QuesTek Innovations LLC; George Krauss, Colorado School of Mines

Tuesday PM Room: Mockingbird 2
March 13, 2012 Location: Swan Resort

Funding support provided by: Oak Ridge National Laboratory; QuesTek Innovations LLC; AMETEK, Inc

Session Chairs: Gregory Olson, Northwestern University; Frédéric Danoix, Université de Rouen

2:00 PM Invited

Ordering Processes in Ni₂(Cr,Mo) Alloy Investigated by TEM and 3D-AP: *Nelia Wanderka*¹; Amit Verma¹; Nikolai Lazarev²; M Sundararaman³; J Singh⁴; ¹Helmholtz Zentrum Berlin für Materialien und Energie GmbH; ²NSC Kharkov Institute of Physics and Technology, Kharkov, Ukraine; ³Hyderabad Central University, India; ⁴Bhabha Atomic Research Centre, Structural Metallurgy Section, Mumbai, India

2:25 PM Invited

The Effect of Creep on the Rhenium Distribution Close to the α/α' Interfaces in a Nickel-Based Superalloy: *Alessandro Mottura*¹; Michael Miller²; Roger Reed³; ¹University of California, Santa Barbara; ²Oak Ridge National Laboratory; ³The University of Birmingham

2:50 PM Invited

Spinodal Decomposition in Fe-Cr and Fe-C Systems: *Frederic Danoix*¹; ¹CNRS - Université de Rouen

3:15 PM

High Strength Conductors for High Field Magnets: *Ke Han*¹; Jun Lu¹; ¹National High Magnetic Field Laboratory

3:30 PM

Applications of Atom Probe Tomography in Computational Materials Design: *Jason Sebastian*¹; Gregory Olson¹; Jim Wright¹; Abhijeet Misra¹; Eric Hamann¹; ¹QuesTek Innovations LLC

3:45 PM Break

4:10 PM

Examination of Carbon Redistribution in Quench and Tempered 4340 Steel: *Amy Clarke*¹; Michael Miller²; David Alexander¹; Robert Field¹; Kester Clarke¹; ¹Los Alamos National Laboratory; ²Oak Ridge National Laboratory

4:25 PM

Microstructural Evolution of Second Phases in Austempered High-Al TRIP Steels Examined by Atom Probe Tomography: *Hyoung Seok Park*¹; Jae Bok Seol¹; Jai Hyun Kwak²; Chan Gyung Park¹; ¹Pohang University of Science and Technology (POSTECH); ²POSCO

4:40 PM

Insight into Cluster Strengthening in a Nb-Microalloyed High Strength Low Alloyed Steel Using Atom Probe Tomography: *Kelvin Xie*¹; Andrew Breen¹; Michael Moody¹; Julie Cairney¹; Simon Ringer¹; ¹The University of Sydney

4:55 PM

Cluster Strengthening of Microalloyed Castrip® Steels: *Sachin Shrestha*¹; Kelvin Xie¹; Chen Zhu¹; Julie Cairney¹; Simon Ringer¹; Chris Killmore²; Kristin Carpenter²; Frank Barbaro²; James Williams²; ¹The University of Sydney, Australian Key Centre for Microscopy and Microanalysis; ²BlueScope Steel, Metallurgical Technology

5:10 PM

The Application of Atom Probe Tomography to Oxide-Dispersion-Strengthened Steels: *Ceri Williams*¹; Emmanuelle Marquis²; Paul Bagot¹; George Smith¹; ¹University of Oxford; ²University of Michigan

5:25 PM

APT Characterization of Nanometer Scale Features in RPV Steels and Nanostructured Ferritic Alloys: Insight, Challenges and Opportunities: *Peter Wells*¹; Nick Cunningham¹; Eric Stergar¹; Yuan Wu¹; G. Robert Odette¹; ¹UC Santa Barbara

5:40 PM

Initial Age Hardening and Nanostructural Evolution in a Cu-Ni-P Alloy: *Yasuhiro Aruga*¹; ¹Kobe Steel, Ltd.

5:45 PM

Quantitative Three Dimensional Atom Probe Analysis of In-Situ Tic Reinforced Ni Composite: *Junyeon Hwang*¹; Sundeep Gopagoni¹; Kristopher Mahdak¹; Jaimie Tiley²; Rajarshi Banerjee¹; ¹University of North Texas; ²AFRL

Energy Nanomaterials: Photovoltaics II

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Reza Shahbazian-Yassar, Michigan Technological University; Ming Au, Savannah River National Laboratory; Meyya Meyyappan, NASA Ames Research Center

Tuesday PM Room: Swan 3
March 13, 2012 Location: Swan Resort

Session Chairs: Reza Shahbazian Yassar, Michigan Technological University; Zohreh Razavi, Georgia Institute of Technology

2:00 PM Invited

Morphology Engineering of 1D, 2D and 3D TiO₂ Nanostructures and Their Application in Dye-Sensitized Solar Cells: *Ziqi Sun*¹; Jung Ho Kim¹; Yue Zhao¹; Shixue Dou¹; ¹University of Wollongong

2:30 PM

Microstructural Evolution of SnS Thin Films Grown by Electrodeposition: *Ho Seong Lee*¹; H. Hennayaka¹; ¹Kyungpook National University

2:45 PM Break

3:05 PM Invited

Synthesis of Nanostructured TiO₂/Carbon Nanotube Heterojunction Electrodes for Solar Energy-Driven Applications: *Zohreh Razavihesabi*¹; Paul Szymanski²; Hamid Garmetani²; Mostafa Elsayed²; ¹Georgia Institut of Technology; ²Georgia Institute of Technology

3:35 PM

Phase-Field Simulations of Patterned Quantum Dot Growth: *Larry Aagesen*¹; Pei-Cheng Ku¹; Leung Lee¹; Katsuyo Thornton¹; ¹University of Michigan

3:55 PM

Electrophoretic Co-Deposition of TiO₂ and ZnO Photoelectrodes for Flexible Dye-Sensitized Solar Cells: *Sheng-Jye Cherng*¹; Chih-Ming Chen¹; ¹National Chung Hsing University

Fatigue and Corrosion Damage in Metallic Materials: Fundamentals, Modeling and Prevention: Fatigue Behaviors at Elevated Temperature

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum; Peter Liaw, University of Tennessee

Tuesday PM
March 13, 2012

Room: Oceanic 6
Location: Dolphin Resort

Session Chairs: E-Wen Huang, National Central University; Peter Liaw, The University of Tennessee

2:00 PM

Thermal Relaxation of Residual Stresses in Laser Shock Peened IN718 SPF and Ti-6Al-4V Alloys: Experiments and Finite Element Modeling: Amrinder Gill¹; Vijay Vasudevan¹; *Dong Qian*¹; Zhong Zhou¹; S.R. Mannava¹; Kristina Langer²; ¹University of Cincinnati; ²Air Force Research Laboratory

2:20 PM

Effects of Intermediate Temperature Long Term Exposure on Mechanical Behavior of 5083-H116 and 5456-H116: *Mohsen Seifi*¹; Justin Brosi¹; John Lewandowski¹; ¹Case Western Reserve University

2:40 PM

Measuring Effects of Holding Time and Oxidation on Thermo-Mechanical Fatigue Properties of Compacted Graphite Iron Using Notched Specimens: *Sepideh Ghodrati*¹; Michael Janssen²; Roumen (R.H) Petrov³; Leo (L.A.I.) Kestens³; Jilt Sietsma²; ¹Materials Innovation Institute (M2i), TUDelft; ²TUDelft; ³Ghent University, TUDelft

3:00 PM

Thermal Fatigue Properties Evaluation of 18% Cr Ferritic Stainless Steel Weld HAZ: *Kyutae Han*¹; Seunggab Hong²; Changhee Lee¹; ¹Hanyang University / Division of Materials Science & Engineering; ²POSCO / Technical Research Laboratory

3:20 PM

Fatigue Deformation Behavior of Dispersion Hardened New Heat Resistant Aluminum Alloy at Elevated Temperature: *Kee-Ahn Lee*¹; Kyu-Sik Kim¹; Si-Young Sung²; Jung-Chul Park³; Bum-Suk Han²; ¹Andong National University; ²Korea Automotive Technology Institute; ³RIST

3:40 PM Break

3:50 PM

Effect of Almen Intensities on High Cycling Fatigue of Al 2024-T4: *Yasser Ahmed*¹; Mostafa El Metwally¹; ¹German University in Cairo

4:10 PM

The Effects of Microstructure upon Remaining Life of Carburized Ethylene Pyrolysis Tubes: *Amy McLeod*¹; Kevin Stevens²; Milo Kral¹; ¹University of Canterbury; ²Quest Integrity NZL Limited

4:30 PM

Fatigue Crack Growth Analysis from Acoustic Emission Data on the Navy H-60 Seahawk Helicopter Tail Gearbox: Eric Hill; *Fady Barsoum*¹; Jun Shishino¹; Ning Leung¹; Prathikshen Selvadurai¹; Alan Timmons¹; William Hardman¹; ¹Embry-Riddle Aeronautical University

4:50 PM

Exploratory Research in Erosion Effects of Nanofluids on Metallic Materials: *Gustavo Molina*¹; Mosfequr Rahman¹; Mario Hulett¹; Valentin Soloiu¹; ¹Georgia Southern University

From Macro to Nano, Understanding Mechanical Behavior across Length Scales: A Structural Materials Division Symposium in Honor of Robert Ritchie: Small Scale Mechanical Behavior and Theory

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Biomaterials Committee

Program Organizers: Jamie Kruzic, Oregon State University; Brad Boyce, Sandia National Labs; Reinhold Dauskardt, Stanford University

Tuesday PM

March 13, 2012

Room: Mockingbird 1

Location: Swan Resort

Session Chairs: James Foulk, Sandia National Laboratory; Andrew Minor, University of California, Berkeley

2:00 PM Introductory Comments

2:05 PM Keynote

Elastic-Plastic Analysis of Nanoscale

Fracture Toughness: *William Gerberich*¹; Natalia Tymiak¹; Eric Hintsala¹; ¹University of Minnesota

2:45 PM Keynote

Mechanical Behavior at the Limit of Strength: *John Morris*¹; ¹University of California Berkeley

3:25 PM

Connecting Nanoscale Mechanical Testing with Bulk Properties: *Andrew Minor*¹; ¹UC Berkeley & LBL

3:40 PM

Mechanical Behavior in Metallic Nanowires: *Scott Mao*¹; Jianyu Huang²; ¹University of Pittsburgh; ²Sandia National lab

3:55 PM Break

4:10 PM

The Impact of Sidewall Roughness on the Macroscopic Tensile Strength of Polycrystalline Silicon: *James Foulk*¹; Brad Boyce¹; Earl Reedy¹; James Ohlhausen¹; ¹Sandia National Laboratories

4:25 PM

Forward and Reversed Loading of Thin Copper Wires at Ambient and Elevated Temperatures: *Andy Bushby*¹; Julian Feuvrier¹; David Dunstan¹; ¹Queen Mary, University of London

4:40 PM

A Combined Experimental and Computational Investigation of Work Hardening in Micron and Submicron Dimensions: *Daniel Kiener*¹; Andrew Minor²; Padubiri Guruprasad³; S. Keralavarma³; Gerhard Dehm¹; Amine Benzerga³; ¹University of Leoben; ²University of California; ³Texas A&M University



TMS 2012

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4:55 PM

Dislocation Dynamics Simulation of Indentation of FCC Crystals: *Mamdouh Mohamed*¹; Ben Larson²; Giacomo Po³; Nasr Ghoniem³; Anter El-Azab¹; ¹Florida State University; ²Oak Ridge National Laboratory; ³University of California, Los Angeles

5:10 PM

The Elastic Anisotropy of Steel Investigated by Nanoindentation: *Ude Hangen*¹; David Vodnick¹; Hysitron, INC.

Integrative Materials Design: Performance and Sustainability: Advances in Integrated Computational Materials Engineering (ICME) & Residual Stress Considerations in Design

Sponsored by: The Minerals, Metals and Materials Society, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizer: Diana A. Lados, Worcester Polytechnic Institute

Tuesday PM
March 13, 2012

Room: Europe 2
Location: Dolphin Resort

Session Chair: Diana Lados, Worcester Polytechnic Institute

2:00 PM Invited

An ICME Approach to Predict Performance Margins Caused by Microstructural Variability: *Elizabeth Holm*¹; Corbett C. Battaile¹; Thomas E. Buchheit¹; Christopher R. Weinberger¹; ¹Sandia National Laboratories

2:25 PM Invited

Predicting the Properties of Magnesium Sheets by Means of a Multiscale Approach – from the Atomistic to the Macroscopic Scale: *Joern Mosler*¹; Malek Homayonifar¹; Mintesnot Nebebe¹; ¹Technische Universität Dortmund and Helmholtz-Zentrum Geesthacht, Germany

2:50 PM Invited

Simulation-Based Strategies to Support Alloy Design for Fatigue Resistance: *David McDowell*¹; ¹Georgia Institute of Technology

3:15 PM Invited

Managing Uncertainty in Fracture: *Brad Boyce*¹; Corbett Battaile¹; James Foulk¹; E. David Reedy¹; ¹Sandia National Labs

3:40 PM Invited

An Integrated Framework for Reducing Uncertainty in Fatigue Life Limits of Turbine Engine Alloys: *James Larsen*¹; Sushant Jha²; Michael Caton¹; Reji John¹; Andrew Rosenberger¹; Christopher Szczepanski¹; Patrick Golden¹; Dennis Buchanan³; Jay Jira¹; ¹Air Force Research Laboratory; ²Universal Technology Corporation; ³University of Dayton Research Institute

4:05 PM Break

4:30 PM Invited

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

4:55 PM Invited

Effects of Residual Stress on the Behavior of Metallic Materials: *Michael Hill*¹; ¹University of California, Davis

5:20 PM Invited

An Evaluation of the Crack-Compliance Method for Determining the Stress Intensity Resulting from Residual Stress: *Keith Donald*¹; ¹Fracture Technology Associates

5:40 PM Invited

The Relative Importance of Various Mechanical Properties on Structural Performance: *Ted Anderson*¹; ¹Quest Integrity Group

International Smelting Technology Symposium (Incorporating the 6th Advances in Sulfide Smelting Symposium): Pretreatment and Recycling Processes

Sponsored by: The Minerals, Metals and Materials Society, The Metallurgy and Materials Society of CIM, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
Program Organizers: Jerome Downey, Montana Tech of the Univ of Montana; Thomas Battle, Midrex Technologies, Inc.; Jesse White, Elkem Solar Research

Tuesday PM
March 13, 2012

Room: Northern A3
Location: Dolphin Resort

Session Chair: To Be Announced

2:00 PM

Integrated Recycling at Boliden's Rönnskär Smelter; Formation of Slag Products: *Sina Mostaghel*¹; Hannes Holmgren²; Taishi Matsushita³; *Caisa Samuelsson*¹; ¹Luleå University of Technology; ²Rönnskär Smelter, Boliden Mineral AB; ³Royal Institute of Technology (KTH)

2:25 PM

Promotion of Recycling Business by Combination of a Pre-Treatment Plant and the Mitsubishi Process at Naoshima Smelter & Refinery: *Yuji Mizuta*¹; Nobuhiro Oguma¹; Shigehiko Iwahori¹; Hideya Sato¹; ¹Mitsubishi Materials Corporation

2:50 PM

Optimum Feed Preparation for Sulfide Smelting: *Jyri Talja*¹; Shaolong Shen¹; Hannu Mansikkaviita¹; ¹Kumera Corporation

3:15 PM

Partially Reduced Feedstocks and Blast Furnace Ironmaking Carbon Intensity: *Petrus Pistorius*¹; ¹Carnegie Mellon University

3:40 PM Break

4:00 PM

Injection of Alternative Carbon Containing Materials in the BF: *Lena Sundqvist Ökvist*¹; Gunilla Hyllander²; Michael Hensmann³; Erik Olsson⁴; Olavi Antila⁴; Stefan Schuster⁵; Maria Lundgren¹; ¹Swerea MEFOS AB; ²LKAB; ³VDEh-Betriebsforschungsinstitut; ⁴SSAB EMEA; ⁵voestalpine Stahl GmbH

4:25 PM

Experiences of Using Various Metallurgical Reactors for Reduction of V-Bearing Steel Slags and Other Wastes: *Mikael Lindvall*¹; Guozhu Ye¹; ¹Swerea MEFOS AB

4:50 PM

Phase Change and Morphology in the Oxidation of Zinc Sulfide Powder: *Okano Satoshi*¹; Hiromichi Takebe¹; Takahiko Okura²; ¹Ehime University; ²Tokyo University

5:15 PM

Using of Fluidized Roasting Technology in Comprehensive Utilization of Magnetized Gold Smelting Waste: *Xiaoyin Liu*¹; Yongfu Yu¹; Wen Chen¹; Xiaosu Lu¹; Zeyou Peng¹; Jialin Li¹; ¹Changsha Research Institute Of Mining And Metallurgy

TUESDAY PM

Materials and Fuels for the Current and Advanced Nuclear Reactors: Structural Materials I

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS/ASM: Nuclear Materials Committee

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Tuesday PM
March 13, 2012

Room: Swan 2
Location: Swan Resort

Session Chair: Kumar Sridharan, University of Wisconsin - Madison

2:00 PM Invited

Light Water Reactor Materials for Commercial Nuclear Power Applications: *Brian Burgos*¹; ¹Westinghouse Electric / Research and Technology

2:30 PM

Cold Spray Technology: A Potential Approach to Address Materials Aging Issues in Nuclear Reactor Systems: *Kumar Sridharan*¹; Benjamin Maier¹; Benjamin Hauch¹; Youngki Yang¹; Todd Allen¹; ¹University of Wisconsin

2:50 PM

Stress Corrosion Crack Initiation Testing of Cold Worked 316 Stainless Steel in Simulated PWR Primary Water under the Spring Loaded Condition: *Yuichi Miyahara*¹; Toshio Yonezawa¹; Atsushi Hashimoto²; ¹Tohoku University; ²Kobe Material Testing Laboratory Co., LTD.

3:10 PM

Creep-Fatigue Behavior of an Advanced Austenitic Alloy Strengthened by Nano-Scale MC Precipitates: *Laura Carroll*¹; *Mark Carroll*¹; Richard Wright¹; ¹Idaho National Laboratory

3:30 PM

Impact of Hydrogen Absorption on the Thermophysical Properties of Zircaloy Cladding: *J. B. Henderson*¹; A. T. Nelson²; K. J. McClellan²; ¹Netzsch Instruments NA; ²Los Alamos National Laboratory

3:50 PM Break

4:00 PM

A Novel Fe-Based ODS Fabrication Process: *Joel Rieken*¹; Iver Anderson²; Matthew Kramer²; ¹Iowa State University; ²Ames Laboratory

4:20 PM

Evaluation of Silicon Carbide Joining for Nuclear and Fusion Applications: *Yutai Katoh*¹; Monica Ferraris²; Tatsuya Hinoki³; Charles Henager⁴; ¹Oak Ridge National Laboratory; ²Politecnico di Torino; ³Kyoto University; ⁴Pacific Northwest National Laboratory

4:40 PM

Precipitation of Sigma Phase in Cast Duplex Stainless Steel Z3CN20.09M for Primary Coolant Pipe of Nuclear Power Plants and Its Influence on Localized Corrosion: *Yongqiang Wang*¹; *Bin Yang*¹; Jun Han¹; ¹University of Science and Technology Beijing

5:00 PM

Effect of Tellurium on Intergranular Cracking in Nickel-based Alloy: *Yanyan Jia*¹; Wenguan Liu¹; Yang Zou¹; Zhijun Li¹; Yanling Lu¹; Min Liu¹; Xingtai Zhou¹; Hongjie Xu¹; ¹Shanghai Institute of Applied Physics, Chinese Academy of Sciences

5:20 PM

Oxide Dispersion Strengthened Steels via Mechanical Alloying and Spark Plasma Sintering: *Somayeh Pasebani*¹; Indrajit Charit¹; Kerry Allaha²; James Cole³; Darryl Butt²; ¹University of Idaho; ²Boise State University; ³Idaho National Laboratory

5:40 PM

Wollastonite Based-Chemically Bonded Phosphate Ceramics with Boron Contents as a Potential Material for Nuclear Shielding Applications: *H. A. Colorado*¹; J. Pleitt²; J-M Yang¹; C. H. Castano²; ¹University of California, Los Angeles; ²Missouri University of Science and Technology

Materials Design Approaches and Experiences III: Non-ferrous Alloys and Processes

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Ji-Cheng Zhao, The Ohio State University; Akane Suzuki, GE Global Research; Deb Whitis, GE Aviation; Michael Fahrman, Haynes International Inc.; Qiang Feng, University of Science and Technology Beijing

Tuesday PM
March 13, 2012

Room: Europe 11
Location: Dolphin Resort

Session Chairs: Michael Fahrman, Haynes International, Inc.; Christopher Hutchinson, Monash University

2:00 PM Invited

Design, Microstructure Evolution, Properties, and Applications of Advanced Intermetallic TiAl Alloys: *Helmut Clemens*¹; Svea Mayer¹; ¹Montanuniversität Leoben

2:30 PM Invited

Tools for Manipulating Precipitation Processes: Alloy and Process Design: *Christopher Hutchinson*¹; ¹Monash University

3:00 PM Invited

Magnesium Alloy Development Using Computational and Experimental Tools: *Alan Luo*¹; Raja Mishra¹; Bob Powell¹; Anil Sachdev¹; ¹General Motors Global Research and Development

3:30 PM Break

3:50 PM Invited

Design of a Nanocrystalline Alloy Coating for Electrical Connector Applications: *Christopher Schuh*¹; Alan Lund²; ¹MIT; ²Xtalic Corporation

4:20 PM Invited

Develop ICME Tool for High Ductility Cast Aluminum Alloys for Automotive Body Applications: *Mei Li*¹; J. Forsmark¹; J. Zindel¹; L. Godlewski¹; Xuming Su¹; ¹Ford Motor Company

4:50 PM

Systems Engineering Framework for the Integrated Computational Design of Advanced Aluminum Alloys: *Abhijeet Misra*¹; James Wright¹; Heng-Jeng Jou¹; William Counts¹; Charles Kuehmann¹; ¹QuesTek Innovations LLC

5:10 PM

The Use of In-Situ Characterization Techniques for the Development of Intermetallic Titanium Aluminides: *Svea Mayer*¹; Thomas Schmoelzer¹; Helmut Clemens¹; ¹Montanuniversitaet Leoben



TMS 2012

141st Annual Meeting & Exhibition

TUESDAY PM

Materials in Clean Power Systems VII: Clean Coal-, Hydrogen Based-Technologies, and Fuel Cells: Materials for Hydrogen Production, Separation, and Storage

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS: Energy Conversion and Storage Committee

Program Organizers: Xingbo Liu, West Virginia University; Teruhisa Horita, National Institute of Advanced Industrial Science and Technology; Jeffrey Hawk, National Energy Technology Lab; Jeffrey Fergus, Auburn University

Tuesday PM
March 13, 2012

Room: Europe 8
Location: Dolphin Resort

Session Chairs: Ya Xu, National Institute for Materials Science; Omer Dogan, National Energy Technology Laboratory

2:00 PM
Catalytic Properties of Ni-Al Intermetallic Nanoparticle Catalysts for Hydrogen Production from Methanol and Methane: *Ya Xu*¹; Junyou Yang²; Masahiko Demura¹; Toshiyuki Hirano¹; ¹National Institute for Materials Science; ²Huazhong University of Science and Technology

2:20 PM
Ca, Li and Mg Based Lightweight Intermetallics for Hydrogen Storage: *Beau Billet*¹; Ji-Cheng Zhao¹; ¹Ohio State University

2:40 PM
Effects of Long Term Aging on Creep Properties of HPA Alloy Hydrogen Reformer Tubes: *Milo Kral*¹; Karl Buchanan¹; ¹University of Canterbury

3:00 PM
Free Form Fabrication of Catalytic Substrates: Tyler Salisbury¹; *Jerome Downey*¹; William Gleason¹; Stacy Davis¹; G. Pinson²; R. Christianson¹; M. Berlin²; R. James¹; E. Rosenberg²; K. Gleason³; R. Hiebert³; J. McCloskey³; ¹Montana Tech of the Univ of Montana; ²University of Montana; ³Center for Advanced Mineral and Metallurgical Processing

3:20 PM
Microstructure and Hydrogen Transport Property of a Mg-Doped Cu-Pd Alloy: *Omer Dogan*¹; Rongxiang Hu²; Michael Gao²; Xueyan Song³; ¹DOE National Energy Technology Laboratory; ²URS; ³West Virginia University

3:40 PM Break

3:50 PM
Improved Palladium Coatings for Hydrogen Purification Applications: Stacy Davis¹; *Jerome Downey*¹; William Gleason¹; Tyler Salisbury¹; G. Pinson²; R. Christianson¹; M. Berlin²; R. James¹; E. Rosenberg²; K. Gleason³; R. Hiebert³; J. McCloskey³; ¹Montana Tech of the Univ of Montana; ²University of Montana; ³Center for Advanced Mineral and Metallurgical Processing

4:10 PM
Thermodynamic and Transport Properties of Abundant-Vacancy Pd_{1-x}In_x: *Douglas Safarik*¹; Paul Tobash¹; Anna Llobet¹; Sven Rudin¹; ¹Los Alamos National Laboratory

4:30 PM
Phase Transitions of Ammonia Borane Investigated Using Raman Spectroscopy at Low Temperature and High Pressure: *Shah Najiba*¹; Jihua Chen¹; Vadym Drozd¹; Andiry Durygin¹; Yongzhou Sun¹; ¹Florida International University

4:50 PM
Mixed Conducting Molten Salt Electrolyte for Na/NiCl₂ Cell: *Tannaz Javadi*¹; Anthony Petric¹; ¹McMaster University

5:10 PM
Effect of Al-Substitution and Melt-Spining Process on Microstructural and Hydrogen Storage Properties of LaNi₅ Intermetallic Compounds: O. Uzun¹; F. Yilmaz²; M.F. Kilicaslan³; G.Y. ÖZALP⁴; *Soon-Jik Hong*⁵; ¹Gaziosmanpasa University; ²Gaziosmanpa University; ³Kastamonu University; ⁴International Centre for Hydrogen Energy Technologies; ⁵Kongju National University

5:15 PM
Phase Transitions of Nano-scaffold Confined Ammonia Borane Dependent on Pressure: *Yongzhou Sun*¹; Jihua Chen¹; Vadym Drozd¹; Shah Najiba¹; ¹Florida International University

Materials Processing Fundamentals: Metallurgy of Non-Ferrous Metals

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Process Technology and Modeling Committee

Program Organizers: Lifeng Zhang, Missouri University of Science and Technology; Antoine Allanore, MIT; Cong Wang, Saint-Gobain High Performance Materials

Tuesday PM
March 13, 2012

Room: Oceanic 8
Location: Dolphin Resort

Session Chairs: Cong Wang, Alcoa Research Center; Lifeng Zhang, Missouri S&T

2:00 PM
Annealing Effect and Tensile Interface Fracture Mechanism of Pure Silver Bonding Wires: *Hao-Wen Hsueh*¹; Fei-Yi Hung¹; Tuan-Sheng Lui¹; Li-Hui Chen¹; ¹Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan

2:25 PM
Directional Solidification of Zn-Sn Alloys: Marco Zurco¹; Carlos M. Rodriguez²; *Carlos E. Schvezov*²; Claudia M. Mendez¹; Alicia Ares²; ¹Faculty of Sciences, University of Misiones; ²CONICET/FCEQyN-UNaM

2:50 PM
Dynamic Recovery during Low Temperature Deformation in an Al-0.1Mg Alloy: *Yan Huang*¹; Philip Prangnell²; ¹Brunel University; ²The University of Manchester

3:15 PM
Applications of Thermo-Chemical and Thermo-Physical Models in the Copper and Lead Pyrometallurgical Industries: *Pengfu Tan*¹; ¹Xstrata Copper

3:40 PM Break

3:55 PM
Challenges in Compound Forging of Steel-Aluminum Parts: *Klaus-Georg Kosch*¹; Bernd-Arno Behrens¹; ¹Institute of Metal Forming and Metal-Forming Machines, Leibniz Universität Hannover

4:20 PM
Study of Supercritical CO₂ Emulsion in Ni Electroplating and Application in Fabrication of Defect-Free Micromechanical Component with High Aspect Ratio: *Tso-Fu Mark Chang*¹; Chiemi Ishiyama¹; Masato Sone¹; ¹Tokyo Institute of Technology

4:45 PM

Investigation of the Mechanical Properties and Microstructure of Friction Stir Welded Aluminum Alloy 6061 Sheets: Daniel Colby¹; Benjamin Goodman¹; Travis Spealman¹; Shabbir Choudhuri¹; Prince Anyalebechi¹; ¹Grand Valley State University

Materials Research in Microgravity: Session IV

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Robert Hyers, University of Massachusetts; Hani Henein, University of Alberta; Valdis Bojarevics, University of Greenwich; James Downey, NASA; Douglas Matson, Tufts University; Achim Seidel, Astrium; Daniela Voss, ESA

Tuesday PM
March 13, 2012

Room: Asia 3
Location: Dolphin Resort

Session Chair: To Be Announced

2:00 PM Invited

ISS-Experiments and Modeling of Columnar-to-Equiaxed Transition in Solidification Processing: Laszlo Sturz¹; Gerhard Zimmermann¹; Charles-Andre Gandin²; Bernard Billia³; Nathalie Mangelinck³; Henry Nguyen-Thi³; David John Browne⁴; Wajira U. Mirihanage⁴; Daniela Voss⁵; Christoph Beckermann⁶; Alain Karma⁷; ¹Access e.V.; ²MINES ParisTech CEMEF; ³Université P. Cézanne, Marseille; ⁴University College Dublin; ⁵European Space Agency - ESA/ESTEC; ⁶University of Iowa, USA; ⁷Northeastern University, USA

2:35 PM Invited

Dendrite Growth into Undercooled Melts: Investigated on Earth and in Reduced Gravity: Dieter Herlach¹; ¹Deutsches Zentrum für Luft- und Raumfahrt

3:10 PM

Coupled Growth in Ternary Systems under Directional Solidification Conditions: Ralph Napolitano¹; Irmak Sargin¹; ¹Iowa State Univ

3:35 PM Break

3:55 PM Invited

Influence of Convection on Dendrite Growth and Microstructure Evolution by Using AC + DC Electromagnetic Levitator: Hideyuki Yasuda¹; Yuki Kanzawa¹; Takashi Fukuda¹; Tomoya Nagira¹; Masato Yoshiya¹; ¹Osaka University

4:30 PM

Liquid Droplet Dynamics in Gravity Compensating High Magnetic Field: Valdis Bojarevics¹; Stuart Easter¹; Koulis Pericleous¹; ¹University of Greenwich

4:55 PM Invited

Measurements of Dendritic Growth Velocities in Undercooled Melts of Pure Nickel Under Static Magnetic Fields: Jianrong Gao¹; Zongning Zhang¹; Yingjie Zhang¹; ¹Northeastern University

5:30 PM

Diamagnetic Levitation by a Superconducting Magnet: A Method for Non-Contact Measurement of the Surface Tension of Aqueous, and other, Diamagnetic Liquids: Richard Hill¹; Laurence Eaves¹; ¹University of Nottingham

Mechanical Behavior at Nanoscale I: Nanowires, Pillar, Multilayers and Nanocrystalline

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Scott Mao, University of Pittsburgh; Julia R Greer, California Institute of Technology; Jianyu Huang, Center for Integrated Nanotechnologies; Marc Legros, CEMES-CNRS; Ting Zhu, Georgia Institute of Technology

Tuesday PM
March 13, 2012

Room: Asia 1
Location: Dolphin Resort

Session Chairs: Gerhard Dehm, Erich Schmid Institut für Materialwissenschaft; Xiaodong Li, University of South Carolina

2:00 PM Invited

Deformation Mechanisms in Cu-Nb Nanolamellar Composites Produced via Severe Plastic Deformation: Nathan Mara¹; John Carpenter¹; Weizhong Han¹; Jon LeDonne²; Jian Wang¹; Irene Beyerlein¹; ¹Los Alamos National Laboratory; ²Carnegie Mellon University

2:30 PM

Characterization of Defects Generated during the Martensitic Transformation in Pseudoelastically-Deformed NiTi Microcrystals: Matthew Bowers¹; Michael Mills¹; Sivom Manchiraju¹; Peter Anderson¹; ¹The Ohio State University

2:50 PM

Deformation Behavior of a Dual-Phase Sheet Steel: Hassan Ghassemi Armaki¹; Robert Maaß²; Julia Greer²; Shrikant Bhat³; Sriram Sadagopan³; Sharvan Kumar¹; ¹Brown University; ²California Institute of Technology; ³ArcelorMittal

3:10 PM

Deforming Nanoporous Gold: Non-Size Effects: Hai-Jun Jin¹; Xing-Long Ye¹; Jörg Weissmüller²; ¹Institute of Metal Research, Chinese Academy of Sciences; ²Institut für Werkstoffphysik und -Technologie, Technische Universität Hamburg-Harburg

3:30 PM Break

3:40 PM

Effects of Alloying, Temperature and Strain-Rate on the Mechanical Behavior of Nanocrystalline Palladium Alloys: Thomas Neithardt¹; Oliver Kraft¹; Ruth Schwaiger¹; ¹Karlsruhe Institute of Technology, Institute for Applied Materials

4:00 PM

Mechanical Behaviors of Nanostructures of Low Melting Temperature Metals as Revealed by Synchrotron Laue X-Ray Microdiffraction: Arief Budiman¹; M. J. Burek²; G. Lee²; D.-C. Jang³; N. Tamura⁴; M. Kunz⁴; T. Tsui²; ¹Los Alamos National Laboratory (LANL); ²University of Waterloo; ³California Institute of Technology; ⁴Advanced Light Source (ALS), Berkeley Lab

4:20 PM

Tensile Properties of Nano-Twinned Cu Nano-Pillars through Nano-Mechanical Testing, Electron Microscopy, and Atomistic Simulations: Dongchan Jang¹; Xiaoyan Li²; Huajian Gao²; Julia Greer¹; ¹California Institute of Technology; ²Brown University

TUESDAY PM



TMS 2012

141st Annual Meeting & Exhibition

4:40 PM

Dislocation Multiplication and Nucleation in Small Metallic Fibers under Stress: The Input of In Situ Transmission Electron Microscopy: *Marc Legros*¹; Frédéric Mompou¹; Daniel Gianola²; Andreas Sedlmayr³; Oliver Kraft⁴; Daniel Caillard¹; ¹CEMES-CNRS; ²University of Pennsylvania; ³Karlsruhe Institute for Technology; ⁴Karlsruhe Institute for Technology

5:00 PM

Deformation of Gold Nanowires: How Impurities Change the Game: *Francesca Tavazza*¹; Lyle Levine¹; Anne Chaka¹; ¹National Institute of Standards and Technology

5:20 PM

Deformation and Fracture of Color-patterned Pulsed Laser Oxides on Stainless Steel: *Samantha Lawrence*¹; Douglas Stauffer²; Ryan Major²; David Adams³; William Gerberich⁴; David Bahr¹; Neville Moody³; ¹Washington State University; ²Hysitron Inc.; ³Sandia National Laboratories; ⁴University of Minnesota

5:40 PM

Strain Heterogeneities within a Sub-Micron Grain in a Polycrystalline Thin Film as Probed by X-Ray Coherent Diffraction during a Thermal Cycle: *Nicolas Vaxelaire*¹; *Stephane Labat*¹; Henry Proudhon²; Christoph Krichlechner³; Olivier Perroud¹; Marie-Ingrid Richard¹; Thomas Cornelius⁴; Jozef Keckes³; Samuel Forest²; Olivier Thomas¹; ¹CNRS - Aix-Marseille University; ²MINES ParisTech - CNRS; ³Erich Schmid Institute of Materials Science; ⁴ESRF

Mechanical Behavior Related to Interface Physics: Structure and Mechanical Behavior of Amorphous and Crystalline Nanocomposites

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Izabela Szlufarska, University of Wisconsin-Madison; Zhiwei Shan, Xi'an Jiaotong University

Tuesday PM
March 13, 2012

Room: Oceanic 1
Location: Dolphin Resort

Session Chairs: Rozaliya Barabash, Oak Ridge National Laboratory; Alla Sergueeva, NanoSteel Company

2:00 PM Keynote

Crystal-Glass Interfaces: *Ju Li*¹; ¹Massachusetts Institute of Technology

2:30 PM Keynote

Interface-Dominated Mechanical Properties of Layered/Fibrous Composites: *Rozaliya Barabash*¹; ¹Oak Ridge National Laboratory

3:00 PM

Dislocation-Interface Interaction in Crystalline-Amorphous Metallic Multilayers: *Christian Brandl*¹; Timothy Germann¹; Amit Misra¹; ¹Los Alamos National Laboratory

3:15 PM

Mechanical Characterization of Nanolayered Al/SiC Composites by High Temperature Nanoindentation: S. Lotfian¹; J. Molina-Aldareguia¹; K. Yazzie²; J. LLorca¹; A. Misra³; *Nikhilesh Chawla*²; ¹IMDEA Materials Institute, 28040-Madrid, Spain; ²Arizona State University; ³Los Alamos National Laboratory, Los Alamos, NM

3:30 PM

The Interfacial Mechanics of the Thin Oxide Skin on Liquid Gallium Alloy: *Ju-Hee So*¹; Rashed Khan¹; *Michael Dickey*¹; ¹NC State University

3:45 PM Break

3:55 PM Keynote

Tensile Ductility and Necking In Small-Volume Metallic Glasses: In the Limit of Suppressed Shear Banding: *Evan Ma*¹; ¹Johns Hopkins University

4:25 PM Keynote

Ductility Mechanisms in Glass Matrix Nanomaterials: *Alla Sergueeva*¹; Sheng Cheng¹; Brian Meacham¹; Daniel Branagan¹; ¹The NanoSteel Company

4:55 PM

Analysis of Heterogeneous Deformation along Grain Boundaries in Tensile Tests of Pure Tantalum: *Ian Jarvis*¹; Thomas Bieler¹; Martin Crimp¹; Darren Mason²; Brad Boyce³; ¹Michigan State University; ²Albion College; ³Sandia National Laboratory

5:10 PM

Novel Design of Functional Nanoporous Metal Architectures: *Eric Detsi*¹; Sergey Punzhin¹; Patrick R. Onck¹; Jeff T.M. De Hosson¹; ¹University of Groningen

Mechanical Performance of Materials for Current and Advanced Nuclear Reactors: Characterization and Modeling of Microstructural Evolution in Nuclear Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Nicholas Barbosa, National Institute of Standards & Tech; Greg Oberson, United States Nuclear Regulatory Commission; Matthew Kerr, United States Nuclear Regulatory Commission; Elaine West, Knolls Atomic Power Laboratory; Stuart Maloy, Los Alamos National Laboratory; Osman Anderoglu, LANL

Tuesday PM
March 13, 2012

Room: Swan 1
Location: Swan Resort

Session Chairs: Elaine West, Knolls Atomic Power Laboratory; Paula Mosbrucker, Los Alamos National Laboratory

2:00 PM Invited

Microstructures and Mechanical Properties in Carbide and Nitride Ceramics for Advanced Nuclear Systems: *Todd Allen*¹; Yong Yang²; Clayton Dickerson³; ¹University of Wisconsin-Madison; ²University of Florida; ³Argonne National Laboratory

2:30 PM

In-Situ Studies and Modeling of the Deformation and Fracture Mechanism for Wrought Zircaloy-4 and Zircaloy-2 as a Function of Stress-State: *Brian Cockeram*¹; Kwai Chan²; ¹Bechtel-Bettis; ²Southwest Research Institute

2:50 PM

Mechanical Properties of Nanocrystalline Zr from Atomistic Simulation: *Zizhe Lu*¹; Dong-Hyun Kim¹; Mark Noordhoek¹; Michele Manuel¹; Susan Sinnott¹; Simon Phillpot¹; ¹University of Florida

3:10 PM

Plastic Accommodation of Zirconium Hydrides: *Cindy Smith*¹; *Ian Robertson*¹; Mohsen Dadfarnia¹; Petros Sofronis¹; ¹University of Illinois

TUESDAY PM

3:30 PM

Microstructural Evolution and Fracture Toughness Recovery by Thermal Annealing in HT9 Steel Irradiated to High Doses: *Osman Anderoglu*¹; Thak Sang Byun²; Stuart Maloy¹; ¹Los Alamos National Laboratory; ²Oak Ridge National Laboratory

3:50 PM Break

4:05 PM

Molecular Dynamics Simulations of Cascade Evolution near Trapped Interstitial Clusters: *Nathan Capps*¹; Aaron Kohnert²; Karl Hammond¹; Donghua Xu¹; Brian Wirth¹; ¹University of Tennessee; ²University of California

4:25 PM

Atomistic Modelling of Helium Trapping by Nanoscale Precipitates: *Niraj Gupta*¹; Alfredo Caro²; Enrique Martinez²; Srinivasan Srivilliputhur¹; ¹University of North Texas; ²Los Alamos National Lab

4:45 PM

Influence of the Coherency of Nano-Oxides in ODS Materials on the Coarsening Kinetics: *Joel Ribis*¹; Yann De Carlan¹; ¹CEA

5:05 PM

Spinodal Decomposition in Duplex Stainless Steel: *Julie Tucker*¹; George Young¹; Michael Miller²; ¹Knolls Atomic Power Laboratory; ²Oak Ridge National Laboratory

5:25 PM

Elemental Solubility Tendency for the Phases of Uranium by Classical Models Used to Predict Alloy Behavior: *Van Blackwood*¹; Travis Koenig¹; Saleem Drera¹; David Olson¹; Brajendra Mishra¹; Doug Porter²; Robert Mariani²; ¹Colorado School of Mines; ²Idaho National Lab

Nanocomposites: Nanocomposite Interfaces and Characterization

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Composite Materials Committee

Program Organizers: Garth Wilks, Air Force Research Laboratory; Jonathan Spowart, Air Force Research Laboratory; Meisha Shofner, Georgia Institute of Technology; John Zhanhu Guo, Lamar University

Tuesday PM
March 13, 2012

Room: Swan 8
Location: Swan Resort

Session Chairs: Meisha Shofner, Georgia Institute of Technology; Javier Garay, University of California, Riverside

2:00 PM

Positron Lifetime Analysis of Polyurea-Nanoclay Composites: *Naidu Seetala*¹; Danny Hubbard¹; Gabriel Burks¹; Alex Trochez¹; Valery Khabashesku²; ¹Grambling State University; ²University of Houston

2:20 PM

Effect of Interfacial Reaction on Mechanical and Corrosion Properties of Oxide Nano-Particle Reinforced Aluminum Matrix Composites: *Jaehyuck Shin*¹; Jiyeon Suh¹; Donghyun Bae¹; ¹Yonsei University

2:40 PM Invited

Interfaces in Functional Nanocomposites: *J. Garay*¹; ¹UC Riverside

3:20 PM Break

3:40 PM

Nano-Scale Characterization on the Metal/Carbon Nanotube Interface: Tushar Borkar¹; *Junyeon Hwang*¹; Sandip Harimkar²; Jaimie Tiley³; Soon-Hyung Hong⁴; Rajarshi Banerjee¹; ¹University of North Texas; ²Oklahoma State University; ³Air Force Research Laboratory; ⁴Korea Advanced Institute of Science and Technology

4:00 PM

Extended X-Ray Absorption Fine Structure (EXAFS) Studies of Radiation Damage-Tolerant Nanocomposites: *Simerjeet Gill*¹; Avishai Ofan¹; Lynne Ecker¹; Amit Misra¹; ¹Brookhaven National Lab

4:20 PM

Structure and Transport Properties of Zeolite-Polymer Composite Membranes for Energy-Efficient Separations: Role of Interactions and Geometry: *Carson Meredith*¹; Jung-Hyun Lee¹; ¹Georgia Tech

4:40 PM

Diffusion of Atmospheric Penetrants in Crosslinked and Uncrosslinked Polydimethylsiloxane Based Nanocomposites: Varun Ullal¹; *Douglas Spearot*¹; ¹University of Arkansas

Neutron and X-Ray Studies of Advanced Materials V: Centennial: Dislocations, Strains, Deformation I

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Xun-Li Wang, Oak Ridge National Laboratory; Gernot Kosterz, ETH Zurich; Lyle Levine, National Institute of Standards and Technology; Peter Liaw, Univ of Tennessee; Yandong Wang, Beijing Institute of Technology; Brent Fultz, California Institute of Technology

Tuesday PM
March 13, 2012

Room: Southern I
Location: Dolphin Resort

Funding support provided by: Office of Basic Energy Sciences, U.S. Dept. of Energy, Dr. P. Thiyagarajan

Session Chairs: Matteo Leoni, University of Trento; Davor Balzar, University of Denver

2:00 PM Keynote

In-Situ Laue Diffraction during Mechanical Testing: *Helena Van Swygenhoven*¹; Julien Zimmermann¹; Cecile Marichal¹; Steven Van Petegem¹; ¹Paul Scherrer Institute

2:25 PM Invited

Deformation Twinning in Mg Probed with Diffraction at Multiple Length Scales: *Donald Brown*¹; Levente Balogh¹; Bjorn Clausen¹; Carlos Tome¹; ¹Los Alamos National Lab

2:45 PM Invited

Structure/Microstructure Analysis of Faulted and Modular Materials from Powder Diffraction Data: Beyond the Deterministic Approach: *Matteo Leoni*¹; ¹University of Trento

3:05 PM

Scientific Opportunities at the High Flux Isotope Reactor Neutron Powder Diffractometer: *Ovidiu Garlea*¹; ¹Oak Ridge National Laboratory

TUESDAY PM



TMS 2012

141st Annual Meeting & Exhibition

3:20 PM

Characterization of Superelasticity in a New Fe-Based Shape Memory Alloy Using Neutron and Synchrotron Radiation: *Saurabh Kabra*¹; Klaus-Dieter Liss¹; Kun Yan¹; David Carr¹; Yuuki Tanaka²; Toshihiro Omori²; Ryosuke Kainuma²; ¹ANSTO; ²Tohoku University

3:35 PM Invited

Line Profile Analysis of Plastically Deformed Single Crystals: *Andras Borbely*¹; ¹Ecole des Mines de Saint-Etienne

3:55 PM Invited

Structural Study of Textured Nanocrystalline ZnO Thin Films Prepared by Pulsed Laser Deposition: *Radomir Kuzel*¹; Jakub Cizek¹; Michal Novotny¹; ¹Charles University in Prague, Faculty of Mathematics and Physics

4:15 PM Break

4:25 PM Invited

Residual Strain Tensor Determination from the Refinement of Multiple Diffraction Patterns: *Davor Balzar*¹; Nicolae Popa²; Sven Vogel³; Donald Brown³; ¹University of Denver; ²National Institute for Materials Physics; ³Los Alamos National Laboratory

4:45 PM Invited

Utilizing In-Situ Neutron Diffraction for Mesoscale Simulation of Recrystallization Texture in Polycrystalline Aluminum: *Bala Radhakrishnan*¹; Sarma Gorti¹; Grigoreta Stoica¹; Alexandru Stoica¹; Govindarajan Muralidharan¹; Muth Thomas¹; Xun-Li Wang¹; ¹Oak Ridge National Laboratory

5:05 PM Invited

Application of In-Situ Neutron and X-Ray Measurements at High Temperatures in the Development of Co-Re-Based Alloys for Gas Turbines: *Debashis Mukherji*¹; Juri Wehrs¹; Joachim Rösler¹; Pavel Strunz²; Ralph Gilles³; Michael Hofmann³; Markus Hölzel³; Helmut Eckerlebe⁴; ¹Technische Universität Braunschweig; ²Nuclear Physics Institute ASCR; ³Technische Universität München; ⁴Helmholtz-Zentrum Geesthacht

5:25 PM

Evolution of Residual Strains in Nanocrystalline Metals Studied by Diffraction: *Steven Van Petegem*¹; Lin Li²; Julien Zimmermann¹; Peter M. Anderson²; Helena Van Swygenhoven¹; ¹Paul Scherrer Institute; ²The Ohio State University

5:40 PM

Through-Thickness Distribution of Residual Stresses in One-Pass and Multi-Pass 70-mm Thick Welds: *Wanchuck Woo*¹; Vyacheslav EM¹; Ji Hyun Yoon¹; Jeong-Ung Park²; Gyu-Baek An³; ¹KAERI (Korea Atomic Energy Research Institute); ²Chosun University; ³POSCO Steel

5:55 PM

Strain-Induced Dimensionality Crossover in the Modulated Structure of Ferromagnetic Shape Memory Alloy Ni₂MnGa: *Zhihua Nie*¹; Yandong Wang¹; Yang Ren²; Dongmei Liu³; Zhenwei Huang³; ¹Beijing Institute of Technology; ²Argonne National Laboratory; ³Northeastern University

Pb-Free Solders and Other Materials for Emerging Interconnect and Packaging Technologies: Alternative Interconnects and Harsh Environmental Influences

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Iver Anderson, Ames Laboratory; Sung Kang, IBM; Albert Wu, National Central Univ; Laura Turbini, Research in Motion; Tae-Kyu Lee, Cisco Systems; Govindarajan Muralidharan, Oak Ridge National Lab; John Elmer, Lawrence Livermore National Lab; Yan Li, Intel

Tuesday PM
March 13, 2012

Room: Swan 9
Location: Swan Resort

Session Chair: To Be Announced

2:00 PM Invited

Aligned Nanowires for Packaging and Circuit Interconnects: *Sungho Jin*¹; ¹UC San Diego

2:25 PM

Compliant Structures as Off-Chip Interconnects: *Suresh Sitaraman*¹; ¹Georgia Institute of Technology

2:50 PM

Mechanical Stress Measurements in Cu Through-Silicon Via (TSV) Using Synchrotron X-Ray Microdiffraction for 3-D Integration: *Arief Budiman*¹; H.-A.-S. Shin²; B.-J. Kim²; S.-H. Hwang²; H.-Y. Son³; M.-S. Suh³; Q.-H. Chung³; K.-Y. Byun³; Y.-C. Joo²; R. Caramto⁴; L. Smith⁴; M. Kunz⁵; N. Tamura⁵; ¹Los Alamos National Laboratory (LANL); ²Seoul National University (SNU); ³Hynix, Inc.; ⁴SEMATECH; ⁵Advanced Light Source (ALS), Berkeley Lab

3:10 PM

Conductive Anodic Filament Formation in Fine Pitch Halogen-Free Organic Substrates: *Koushik Ramachandran*¹; Fuhun Liu¹; Nitesh Kumbhat¹; Raj Pulugurtha¹; Venky Sundaram¹; Rao Tummala¹; ¹Georgia Institute of Technology

3:30 PM

Investigations of Interfacial Features in Thick Al Wire Bonds: *Golta Khatibi*¹; Brigitte Weiss¹; Johannes Bernardi²; ¹University of Vienna; ²Vienna University of Technology

3:50 PM

Effects of Combined Harsh Conditions on Wire Bond Reliability: *Maria Mirgizoudi*¹; Changqing Liu¹; Paul Conway¹; Steve Riches²; ¹Loughborough University; ²GE Aviation Systems - Newmarket

4:10 PM

Advances in Pressure-Less Sintering for High Temperature Electronic Applications: *Jiong (Jenny) England*¹; Srinivas Chada¹; Richard Kuder¹; Julissa Eckenrode¹; Javier Gutierrez¹; Paul Gleeson¹; ¹Henkel

4:35 PM Invited

Novel Sinter Paste Concept - A Lead Free Die Attach Alternative: Wolfgang Schmitt¹; Thomas Krebs¹; *Yvonne Loewer*²; ¹W.C. Heraeus; ²Heraeus Materials Singapore Pte Ltd

5:00 PM

Effect of Solder Properties on Microstructural and Damage Evolution in Au-Sn Solder Joints: *Govindarajan Muralidharan*¹; Kanth Kurumaddali¹; Andrew Kercher¹; Scott Leslie²; ¹Oak Ridge National Laboratory; ²Powerex Inc

5:20 PM

Microstructure and Sn Crystal Orientation Evolution in Sn-3.5Ag Lead-Free Solders in High Temperature Packaging Applications: *Bite Zhou*¹; Govindarajan Muralidharan²; Kanth Kurumadalli²; Andrew Kercher²; Chad Parish²; Scott Leslie³; Thomas Bieler¹; ¹Michigan State University; ²Oak Ridge National Laboratory; ³Powerex Inc

5:40 PM

Comparison of Thermal Measurement Methodologies Used in Electronics Industry: *Dan Maslyk*¹; Srinivas Chada¹; Scott Allen¹; Julissa Eckenrode¹; ¹Henkel

Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XI: General Issues in Microelectronics

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Alloy Phases Committee

Program Organizers: Chih-Ming Chen, National Chung Hsing University; Jae-Ho Lee, Hongik University; Ikuo Ohnuma, Tohoku University; Clemens Schmetterer, TU Bergakademie Freiberg; Yee-Wen Yen, National Taiwan University of Science and Technology; Shih-Kang Lin, University of Wisconsin – Madison

Tuesday PM
March 13, 2012

Room: Swan 10
Location: Swan Resort

Session Chairs: Yee-Wen Yen, National Taiwan University of Science and Technology; Shih-Kang Lin, National Cheng Kung University

2:00 PM Invited

Synthesis and Characterization of Low Temperature Sn-Cu and Sn Nanoparticles for the Fabrication of Highly Conductive Ink: Yun Hwan Jo¹; Inyu Jung¹; *Hyuck Mo Lee*¹; ¹KAIST

2:20 PM Invited

Electrochemical Study on the Silica Particles Dispersed Permalloy Composite Coating: So-Yeon Park¹; Myung-Won Chung¹; *Jae-Ho Lee*¹; ¹Hongik University

2:40 PM

Thermodynamic Stability and Diffusion Barrier Properties of Amorphous Ta-Rh Alloys for Cu Metallization: *Neda Dalili*¹; Qi Liu¹; Douglas Ivey¹; ¹University of Alberta

2:55 PM

Application of High-Performance, Advanced Barrierless Cu Alloy Film in Cu Metallization: *Chon-Hsin Lin*¹; ¹Asia-Pacific Institute of Creativity/Environmental Engineering

3:10 PM

Effects of Levelers on Copper Electroplating in Patterned Substrate: Myung-Won Jung¹; In-Seok Kang¹; Ki-Tae Kim¹; *Jae-Ho Lee*¹; ¹Hongik University

3:25 PM

The Electrical Characteristics and Interfacial Interaction of Ti/Ni/Ag/Au Multilayers under Thermal Cycling Test : *Fu-Jung Yeh*¹; Tsung-Chieh Chiu¹; Kwang-Lung Lin¹; ¹National Cheng Kung University

3:40 PM Break

3:50 PM Invited

New Solution Method for SiC Crystal Growth: *Shigeto Nishitani*¹; Yosuke Yamamoto¹; Tadaaki Kaneko¹; ¹Kwansei Gakuin University

4:10 PM Invited

Method of Selective Electroplating having Strong Adhesion and Exceptional Uniformity by Nanoparticle Immobilization: *Shien Ping Feng*¹; Bo Yu²; Shuo Chen²; Zhifeng Ren²; Gang Chen³; ¹The University of Hong Kong; ²Boston College; ³Massachusetts Institute of Technology

4:30 PM

A Study on the Formation Mechanism of Ytterbium Germanide for Schottky Contact Applications: *Sekwon Na*¹; Byunghoon Lee¹; Hwayoul Choi¹; Haseok Jeon¹; Juyun Choi¹; Yujin Seo²; Hyounsub Kim¹; Seok-Hee Lee²; Hoo-Jeong Lee¹; ¹Sungkyunkwan university; ²Korea Advanced Institute of Science and Technology

4:45 PM

Electrochemical Behavior of CIGS Electrodeposition for the Application of Photovoltaic Cell: *Hyunju Lee*¹; Jae-Ho Lee²; Yangdo Kim¹; ¹Pusan National University; ²Hongik University

5:00 PM

Intermetallic Compound Formation and Morphology Evolution in the Bi-xSn Solder Joint with Cu Substrate: *JinYi Wang*¹; Chih-Ming Chen¹; ¹National Chung Hsing University

5:15 PM

Study of EM-Induced ENEPIG Bond-Pad Consumption at Sn(Cu)/ENEPIG Joint Interface: *Shih Han Wu*¹; Cheng Yi Liu¹; ¹National Central University

Phase Transformations and Deformation in Magnesium Alloys: Deformation Twinning and Texture

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Jian-Feng Nie, Monash University; Sean Agnew, University of Virginia; Suveen Mathaudhu, Army Research Office

Tuesday PM
March 13, 2012

Room: Southern V
Location: Dolphin Resort

Session Chairs: Sean Agnew, University of Virginia; Suveen Mathaudhu, Army Research Office

2:00 PM Invited

Generalized Approach for Analyzing Strengthening Effects of Twins in Polycrystalline Metals and Alloys: *Subhash Mahajan*¹; ¹University of California

2:25 PM

Interaction between Dislocation and Tensile Twin in Magnesium Single Crystals: Ming Zhe Bian¹; *Kwang Seon Shin*¹; ¹Magnesium Technology Innovation Center, Seoul National University

2:50 PM

Deformation Twinning in Nanocrystalline Mg-Alloys: *Suveen Mathaudhu*¹; Baolong Zheng²; Khaled Youssef³; Marta Pozuelo⁴; Laszlo Kecskes⁵; Yizhang Zhou²; Wei Kao⁴; Sungho Kim⁶; Bin Li⁶; Xiaolei Wu⁷; Carl Koch³; Jenn-Ming Yang⁴; Enrique Lavernia²; Yuntian Zhu³; ¹U.S. Army Research Office; ²University of California - Davis; ³North Carolina State University; ⁴University of California - Los Angeles; ⁵U.S. Army Research Laboratory; ⁶Mississippi State University; ⁷Chinese Academy of Sciences



TMS 2012

141st Annual Meeting & Exhibition

TUESDAY PM

3:15 PM Invited

A Physically Based Phenomenological Model for Deformation Twinning in Magnesium Alloys: *Matthew Barnett*¹; ¹Deakin University

3:40 PM Invited

Effect of Particle Shape and Habit on Twinning in Magnesium Alloys: *Joseph Robson*¹; Nicole Stanford²; Matthew Barnett²; ¹University of Manchester; ²Deakin University

4:05 PM Break

4:20 PM Invited

Structure Evolution in AZ61L along a Fine-Grain Sheet Processing Path: Tracy Berman¹; William Donlon¹; Victoria Miller¹; Jack Huang²; Ray Decker²; Wayne Jones¹; *Tresa Pollock*³; ¹University of Michigan; ²nanoMag; ³University of California Santa Barbara

4:45 PM Invited

Effect of Ca Addition on Texture Evolution and Deformation Behavior of Mg-Zn Alloy Sheets: D.-W. Kim¹; J. H. Bae¹; B. C. Suh¹; M. S. Shim¹; D. H. Kim²; *Nack J. Kim*¹; ¹POSTECH; ²Yonsei University

5:10 PM Invited

Effect of Deformation Structure on Static Recovery and Recrystallization of AZ31 Magnesium Alloy: *Qing Liu*¹; Zhen Zeng¹; Yunchang Xin¹; ¹Chongqing University

5:35 PM Invited

Work Hardening Behavior of the Magnesium Alloy AZ80 under Multi-Axial Loading: Philip Tomlinson¹; Chad Sinclair¹; Michael Gharghour²; *Warren Poole*¹; ¹University of British Columbia; ²National Research Council Canada

Processing to Control Morphology and Texture in Magnetic Materials: Role of Magnetic Fields and Texturing to Improved Magnetic Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Matthew Kramer, Iowa State University; Mike McHenry, Carnegie Mellon University; David Laughlin, Carnegie Mellon University; Jinfang Liu, Electron Energy Corporation; Bill Soffa, University of Virginia; Ivan Skorvanek, Institute of Experimental Physics

Tuesday PM

March 13, 2012

Room: Europe 10

Location: Dolphin Resort

Session Chairs: David Laughlin, Carnegie Mellon; Sophie Rivoirard, CNRS

2:00 PM Invited

The Role of Magnetic Energy in the Remnant State of Spinodally Decomposed Titanomagnetite-Magnetite Minerals: *Michael McHenry*¹; Nicholas Jones¹; Huseyin Ucar¹; Amanda Velázquez¹; Catherine Groschner¹; Marina Diaz-Michelena²; David Laughlin¹; ¹Carnegie Mellon University; ²Instituto Nacional de Técnica Aeroespacial

2:25 PM Invited

Effect of Magnetic Field Annealing on the Random Magnetocrystalline Anisotropies in Nanocrystalline Soft Magnetic Alloys: *Kiyonori Suzuki*¹; ¹Monash University

2:50 PM

Neutron Scattering Analysis of Magnetostructural Phase Transformations of High Magnetic Field Textured Shape Memory Alloys: *Ben Shassere*¹; Orlando Rios¹; Khorgolkhuu Odbadrakh¹; Jason Hodges¹; Saad Elorfi¹; Alex Melin¹; Gerry Ludtka¹; Boyd Evans¹; ¹Oak Ridge National Laboratory

3:05 PM

High Magnetic Field Effect on the Solid State Phase Transformation in Fe-Co Alloys: *Bianca Frincu*¹; Sophie Rivoirard¹; Olivier Geoffroy²; Thierry Waeckerle³; ¹CNRS/CRETA Grenoble; ²Grenoble Electrical Engineering laboratory; ³ArcelorMittal Research Center

3:20 PM

Effects of FeCo Magnetic Nanoparticles on Microstructure and Mechanical Properties of Sn-Ag-Cu Alloy: Siyang Xu¹; Ashfaque Habib¹; *Michael McHenry*¹; ¹Carnegie Mellon University

3:35 PM Break

3:55 PM Invited

Classical Nucleation Theory Description of Phase Selection and Compositional Partitioning in Co-Rich (Co,Fe)ZrB-based Nanocrystalline / Amorphous Nanocomposites: *Paul Ohodnicki*¹; Michael Widom²; Samuel Kernion²; David Laughlin²; Michael McHenry²; ¹National Energy Technology Laboratory; ²Carnegie Mellon University

4:20 PM Invited

Nanostructuring and Texturing for Improved Magnetic Materials: *David Sellmyer*¹; Y. Liu¹; T.A. George¹; Ralph Skomski¹; ¹University of Nebraska

4:45 PM Invited

Roles of Texture Formation and Grain Refinement on Nanocomposite Magnetic Alloys: *Matthew Willard*¹; Lamar Minter²; Matt Brandes³; Maria Daniil⁴; ¹Naval Research Laboratory; ²Tennessee State University; ³The Ohio State University; ⁴George Washington University

5:10 PM Invited

High Pressure Crystallization of FeCo Based Alloys: *Matthew Lucas*¹; ¹Air Force Research Laboratory

Radiation Effects in Ceramic Oxide and Novel LWR Fuels: Experimental Characterization of Radiation Damage in Uranium Fuel and Surrogate Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Peng Xu, University of Wisconsin; Jian Gan, Idaho National Laboratory; Ram Devanathan, Pacific Northwest National Laboratory; Edward Lahoda, Westinghouse Electric Company; Michele Manuel, University of Florida; Ramprashad Prabhakaran, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Tuesday PM

March 13, 2012

Room: Macaw 2

Location: Swan Resort

Funding support provided by: The Center for Materials Science of Nuclear Fuel, an Energy Frontier Research Center led by the Idaho National Laboratory

Session Chairs: Todd Allen, University of Wisconsin - Madison; Jian Gan, Idaho National Laboratory

2:00 PM Introductory Comments

2:05 PM Invited

Irradiation-Induced Defects in Oxide Nuclear Fuels: *William Weber*¹; ¹University of Tennessee

2:35 PM

XPS Measurements of Radiation Damage in Thin Film Single Crystal UO₂ and U₂O₃: *Brent Heuser*¹; Melissa Strehle¹; ¹University of Illinois

2:50 PM

Irradiation Damage of CeO₂ with Xe and Kr Implantation: *Lingfeng He*¹; Clarissa Yablinsky¹; Mahima Gupta¹; Todd Allen¹; Jian Gan²; ¹University of Wisconsin-Madison; ²Idaho National Laboratory

3:05 PM

Stoichiometry Dependence of the Evolution of Irradiated-Induced Defect Clusters in Ce_xLa_{1-x}O₂: *Weiying Chen*¹; Bei Ye¹; Aaron Oaks¹; Yinbin Miao¹; Brian Kleinfeldt¹; Mark Kirk²; James Stubbins¹; ¹U of Illinois at Champaign-Urbana; ²Argonne National Laboratory

3:20 PM Break

3:45 PM Invited

Microstructure Characterization and Thermal Annealing of Irradiated Oxide Fuels: Understanding Gas Behavior and Restructuring at High Burnups: *Thierry Wiss*¹; Arne Janssen¹; Bert Cremer¹; Hatmut Thiele¹; Ondrej Benes¹; Jean-Yves Colle¹; Dragos Staicu¹; Vincenzo Rondinella¹; Rudy Konings¹; ¹EC - JRC - Institute for Transuranium Elements

4:15 PM Invited

TEM Characterization of Irradiated RERTR Dispersion Fuels: *Jian Gan*¹; Dennis Keiser¹; Brandon Miller¹; Adam Robinson¹; Jan-Fong Jue¹; Pavel Medvedev¹; Daniel Wachs¹; ¹Idaho National Laboratory

4:45 PM

3D Microstructural Characterization of Oxide Nuclear Fuel Surrogates: Effect of the Processing Conditions on Grain Boundary Distributions: *Karin Rudman*¹; Darrin Byler²; Ham Lim¹; Robert McDonald¹; Pedro Peralta¹; Chris Stanek²; Kenneth McClellan²; ¹Arizona State University; ²Los Alamos National Laboratory

5:00 PM

Ion Irradiations in La Doped CeO₂: the Effects of Impurity and Excessive Oxygen Vacancy Environment: *Di Yun*¹; Aaron Oaks²; Jeffrey Rest¹; Abdellatif Yacout¹; Marquis Kirk¹; Wei-ying Chen²; James Stubbins²; ¹Argonne National Laboratory; ²University of Illinois at Urbana-Champaign

5:15 PM

Analysis and Modeling of Swift Heavy Ion Irradiation Defects in CeO₂: *Clarissa Yablinsky*¹; Anthony Schulte¹; Peng Xu²; Jianguo Yu³; Jian Gan³; Todd Allen¹; ¹University of Wisconsin; ²Westinghouse Electric Company; ³Idaho National Laboratory

Randall M. German Honorary Symposium on Sintering and Powder-Based Materials: Powder Processing and Consolidation I

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: K. Morsi, San Diego State University; Fernand Marquis, Naval Postgraduate School; John Meyer, Iowa State University; Ahmed El-Desouky, San Diego State University; Eugene Olevsky, San Diego State University

Tuesday PM
March 13, 2012

Room: Oceanic 2
Location: Dolphin Resort

Session Chair: Z. Zak Fang, University of Utah

2:00 PM Keynote

A Tribute to the Breadth and Depth of the Influence of Randall M. German on Particulate Materials Processing: *John Smugersky*¹; ¹Sandia National Laboratories, Livermore, CA 94551

2:30 PM Invited

Application of Metal Injection Molding to Soft Magnetic Materials: *Hideshi Miura*¹; ¹Kyushu University

2:55 PM Invited

Novel Approaches to Powder Processing: Structure and Mechanical Properties: *Marc Meyers*¹; C Wei¹; E Olevsky¹; Naresh Thadhani¹; ¹UCSD

3:20 PM Invited

Dynamic Shock-Compression of Particulate Materials: Current Understanding and Possibilities: *Naresh Thadhani*¹; ¹Georgia Institute of Technology

3:45 PM

Pressureless Sintering of Si₃N₄/SiC Nanopowders Prepared by High Energy Reaction Milling of Silica Fume: *Jyothi Suri*¹; Leon Shaw¹; ¹University of Connecticut

4:00 PM Break

4:15 PM

Development of Solid Freeform Fabrication for Metallic Parts Using Selective Inhibition of Sintering: *Mahdi Yoozbashizadeh*¹; Behrokh Khoshnevis¹; ¹University of Southern California

4:30 PM

Numerical Simulation of Cold Pressing of Armstrong CP-Ti Powders: *Adrian Sabau*¹; Sarma Gorti¹; William Peter¹; Wei Chen¹; Yukinori Yamamoto¹; ¹Oak Ridge National Laboratory

4:45 PM

The Effect of Coke Particle Size on the Thermal Profile of the Sintering Process Product: *Nader Tahanpesarandezfuly*¹; Ali Heidary Moghadam¹; ¹Azad University

5:00 PM

Issues and Trends in Powder Injection Molding in Korea; Research and Applications: *Seong Jin Park*¹; ¹POSTECH

5:15 PM

Consolidation of Ferritic Oxide Dispersion Strengthened Alloys by Spark Plasma Sintering: *Kerry Allahaar*¹; Jatuporn Burns¹; Brian Jaques¹; Indrajit Charit²; Darryl Butt¹; James Cole³; ¹Boise State University; ²University of Idaho; ³Idaho National Laboratory

Recycling General Sessions: Electronics

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
Program Organizer: Joseph Pomykala, Alter Trading

Tuesday PM
March 13, 2012

Room: Europe 4
Location: Dolphin Resort

Session Chair: Joseph Pomykala, Alter Trading

2:00 PM

Control of Gas Emission during Pyrolysis of Waste Printed Wiring Boards: Alex Luyima¹; Honglan Shi¹; *Lifeng Zhang*¹; Jaan Kers²; ¹Missouri University of Science and Technology; ²Tallinn University of Technology

2:20 PM

Leaching Studies for Metals Recovery from Waste Printed Wiring Boards (PWBs): Alex Luyima¹; Honglan Shi¹; *Lifeng Zhang*¹; ¹Missouri University of Science and Technology

TUESDAY PM



TMS 2012

141st Annual Meeting & Exhibition

TUESDAY PM

2:40 PM

Effects of Inoculums Volume on Metals Extraction from Printed Circuit Boards of Computers by Bacterial Leaching: *Luciana Yamane*¹; Denise Espinosa¹; Jorge Tenório¹; ¹Polytechnic School of São Paulo University

3:00 PM Break

3:20 PM

Removal of Copper Cyanide Complexes from Solutions Formed in Silver/Gold –Cyanidation Recovery Process: *Jose Parga*¹; Jesus L. Valenzuela²; Luciano Ramirez¹; ¹Institute Technology of Saltillo; ²University Hermosillo

3:40 PM

Dissolution of Mixed Zinc-Carbon and Alkaline Battery Powders in Sulphuric Acid Using Ascorbic/Oxalic Acid as a Reductant: *Muammer Kaya*¹; ¹ESOGÜ

4:00 PM

Selective Recovery of Precious Metals by Selective Adsorption on Garlic Peel Gel: *Kai Huang*¹; Shuqiang Jiao¹; Hongmin Zhu¹; ¹University of Science and Technology Beijing

4:20 PM

Separation of Si/SiC Wiresaw Cutting Powder through Sedimentation by Adjusting the Solution pHs: *Kai Huang*¹; Hao Deng¹; Jichao Li¹; Hongmin Zhu¹; ¹University of Science and Technology Beijing

Solid-State Interfaces II: Toward an Atomistic-Scale Understanding of Structure, Properties, and Behavior through Theory and Experiment: Mechanical Properties

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Xiang-Yang Liu, Los Alamos National Lab; Douglas Spearot, University of Arkansas; Guido Schmitz, University of Münster; David Seidman, Northwestern University

Tuesday PM

Room: Oceanic 7

March 13, 2012

Location: Dolphin Resort

Funding support provided by: Los Alamos National Laboratory

Session Chairs: Amit Misra, Los Alamos National Lab; Pascal Bellon, University of Illinois

2:00 PM Invited

Creep Deformation in Ion Irradiated Nanocrystalline Cu Alloys: *Robert Averback*¹; Pascal Bellon¹; Yinon Ashkenazy²; Kaiping Tai¹; Jonathan Schäfer³; Karsten Albe³; ¹University of Illinois; ²Hebrew University of Jerusalem; ³Technische Universität Darmstadt

2:30 PM Invited

Resolving the Contribution of Interfaces in the Deformation of Nanocrystalline Copper with Atomistic Simulations: *Garritt Tucker*¹; Shreevart Tiwari¹; Jonathan Zimmerman²; David McDowell¹; ¹Georgia Institute of Technology; ²Sandia National Laboratories

3:00 PM

Heterophase Interface Character Distributions (HICDS) in Accumulative Roll-Bonded (ARB) CU-NB Multilayered Composites at Multi-Scale: *Sukbin Lee*¹; Jonathan LeDonne¹; Irene Beyerlein²; Nathan Mara²; Anthony Rollett¹; ¹Carnegie Mellon University; ²Los Alamos National Lab

3:20 PM

Lithium Segregation at Matrix/Precipitate Interfaces in Al-Li-Se and Al-Li-Sc-Yb Alloys: Thermodynamic Treatment, and Effects on Aging Microhardness: Matthew Krug¹; David Dunand²; *David Seidman*²; ¹General Electric Aviation; ²Northwestern University

3:40 PM Break

3:45 PM

Intergranular Fracture Behavior in UO₂: Molecular Dynamics Simulations: *Yongfeng Zhang*¹; Xiangyang Liu²; Bulent Biner¹; Paul Millett¹; Michael Tonks¹; David Andersson²; ¹Idaho National Lab; ²Los Alamos National Lab,

4:05 PM

On the Fracture Toughness of Polycrystalline LiCoO₂: *Meng Qu*¹; William Woodford¹; John Maloney¹; W. Craig Carter¹; Yet-Ming Chiang¹; Krystyn Van Vliet¹; ¹Massachusetts Institute of Technology

4:25 PM

Rate Dependence Dissipation in Dynamic AFM: *Gabriela Venturini*¹; Alejandro Strachan¹; ¹Purdue University

4:45 PM

Mechanisms for the Nucleation of Lattice Dislocations from fcc/bcc Incoherent Interfaces: *Ruifeng Zhang*¹; Jian Wang¹; Irene Beyerlein¹; Timothy Germann¹; ¹LANL

5:05 PM

Molecular Dynamics Simulation of the Mechanical Behavior of Metallic Glass/Crystalline Composites: *Anupriya Agrawal*¹; Logan Ward¹; Katharine Flores¹; Wolfgang Windl¹; ¹The Ohio State University

Stochastic Methods in Materials Research: Session I

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Dallas Trinkle, University of Illinois, Urbana-Champaign; Richard Hennig, Cornell University

Tuesday PM

Room: Europe 7

March 13, 2012

Location: Dolphin Resort

Session Chairs: Richard Hennig, Cornell University; Dallas Trinkle, University of Illinois at Urbana-Champaign

2:00 PM Invited

Automated Materials Design of Metallic Glasses Using Genetic Algorithms: *Logan Ward*¹; Katharine Flores¹; Wolfgang Windl¹; ¹The Ohio State University

2:30 PM

Data-Driven Models Evolved through Multi-Objective Genetic Algorithms and Their Materials Applications: *Nirupam Chakraborti*¹; ¹Indian Institute of Technology

2:50 PM

Optimum Approximation for Three-Point Correlation Function: *Majid Baniassadi*¹; Hamid Garmestani²; ¹Georgia Institute of Technology Materials Science and Engineering ; ²Georgia Institute of Technology Materials Science and Engineering

3:10 PM Break

3:20 PM Invited

Stochastic Geometry and Transformation Kinetics Theories: Basics and Results: *Paulo Rios*¹; Elena Villa²; ¹UFF-EEIMVR; ²University of Milan

3:50 PM

Forward and Inverse Analysis of Engineering Neutron Diffraction Data with Neural Networks: *Seung-Yub Lee*¹; Hyuntae Na²; Ersan Ustundag²; ¹Columbia University; ²Iowa State University

4:10 PM Break

4:20 PM

Probabilistic Modeling of Microstructure Evolution Using Finite Element Representation of Statistical Correlation Functions: *Veera Sundararaghavan*¹; ¹University of Michigan

4:40 PM

Unsupervised Learning Algorithm for the Estimation of Crystallographic Texture from Discrete Orientation Measurements: *Stephen Niezgodá*¹; Jared Glover²; Carlos Tome¹; Rodney McCabe¹; ¹Los Alamos National Laboratory; ²Massachusetts Institute of Technology

5:00 PM

A Calibrated Monte Carlo Approach to Quantify the Impacts of Misorientation and Different Driving Forces on Texture Development: *Liangzhe Zhang*¹; Anthony Rollet²; Timothy Bartel³; Di Wu⁴; Mark Lusk¹; ¹Colorado School of Mines; ²Carnegie Mellon University ; ³Sandia National Laboratories; ⁴Northeastern University

Symposium in Memory of Patrick Veysseyre: Understanding the Mechanisms Controlling Plastic Flow: Intermetallic Alloys

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division

Program Organizers: Georges Saada, LEM CNRS ONERA; Dennis Dimiduk, Air Force Research Laboratory; Hael Mughrabi, University Erlangen-Nuernberg; Haruyuki Inui, Kyoto University

Tuesday PM
March 13, 2012

Room: Europe 6
Location: Dolphin Resort

Funding support provided by: National Science Foundation

Session Chairs: Helena Van Swygenhoven-Moens, Paul Scherrer Institute; T. Pollock, MSE/Michigan University

2:00 PM Invited

Plasticity and Dislocation Structures in L12-Ordered Intermetallic Compounds and Transition-Metal Silicides: *Haruyuki Inui*¹; Kyosuke Kishida¹; Norihiko Okamoto¹; ¹Kyoto University

2:30 PM Invited

Some Long-Period Superstructures and the Related Motion of Dislocations in Al-Rich TiAl Single Crystals: *Takayoshi Nakano*¹; Yukichi Umakoshi¹; ¹Osaka University

3:00 PM Invited

Determination of Fundamental Characteristics of Dislocations in Intermetallic Compounds Using γ -Surfaces: *Vasek Vitek*¹; ¹University of Pennsylvania

3:30 PM Invited

STEM Imaging and Analysis of the Fine Structure of Dislocations in Ni-Based Superalloys: Patrick Phillips¹; Hallee Deutchman¹; Yi Yun Li¹; Ning Zhou¹; Yunzhi Wang¹; *Michael Mills*¹; ¹The Ohio State University

4:00 PM Break

4:15 PM Invited

Influence of Dislocation Activity in the Alpha 2 Phase on the Plastic Deformation of Titanium Aluminides: Jörg Wieszorek¹; Michael Loretto²; *Hamish Fraser*³; ¹University of Pittsburg; ²University of Birmingham; ³The Ohio State University

4:20 PM Invited

A Dislocation Dynamics Simulation of the Temperature Dependence of the Flow Stress of L12 Alloys: *Ronan Madec*¹; Patrick Veysseyre²; Georges Saada²; ¹CEA, DAM, DIF; ²LEM (CNRS/ONERA)

4:40 PM Invited

A First Principles Study of the Effect of Ti and Ta on the SFE of the γ Phase of Co-based Superalloys: *Alessandro Mottura*¹; Anderson Janotti¹; Tresa Pollock¹; ¹University of California, Santa Barbara

5:00 PM Invited

Cyclic Behavior of a Ni-Based Superalloy Characterized by Electron Microscopy: *Patrick Phillips*¹; David Mourer²; Dan Wei²; Michael Mills¹; ¹Ohio State University; ²GE Aviation

Titanium: Advances in Processing, Characterization and Properties: Microstructure Evolution and Characterization II

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Christopher Szczepanski, US Air Force Research Laboratory; Vasisht Venkatesh, Pratt & Whitney

Tuesday PM
March 13, 2012

Room: Oceanic 3
Location: Dolphin Resort

Session Chairs: Ayman Salem, Materials Resources, LLC; Henry Rack, Clemson University; Adam Pilchak, US Air Force Research Laboratory

2:00 PM Invited

Characterization of Elongated Microtextures in Ti Alloys by Ultrasonic Backscattering: *Stan Rokhlin*¹; Jia Li¹; Oleg Lobkis¹; Adam Pilchak²; ¹The Ohio State University; ²US Air Force Research Laboratory

2:30 PM Invited

Quantifying Ti-6Al-4V Bimodal Microstructure Using Microstructure Informatics: *Ayman Salem*¹; David Turner²; Dan Satko²; Joshua Shaffer²; Stephen Niezgodá³; Surya Kalidindi²; ¹Materials Resources LLC; ²Drexel University; ³Los Alamos National Laboratory

3:00 PM

An Experimental Study on the Effect of Microstructure on Oxygen Ingress in Ti-6242S Alloy: S. Knox¹; *G. Viswanathan*²; M. Chapman¹; A. Shiveley²; J. Tiley²; ¹Southwestern Ohio Council for Higher Education/ Air Force Research Laboratory; ²Air Force Research Laboratory

TUESDAY PM



TMS 2012

141st Annual Meeting & Exhibition

TUESDAY PM

3:20 PM

Characterizing and Exploring the Broad Utility of Kinetic Metallization, a Novel Subsonic Cold Spray Metal Deposition Technique: *John Sosa*¹; Peter Collins²; Hamish Fraser¹; ¹The Ohio State University; ²University of North Texas

3:40 PM

Determining the Variance and Distribution of Quantified Microstructure in $\alpha + \beta$ Processed Ti-6Al-4V and Their Contribution to the Accuracy of Property-Predictive Neural Network Models: *Meg Noble*¹; Daniel Huber¹; John Sosa¹; Travis Presley¹; Hamish Fraser¹; ¹Ohio State University

4:00 PM

Calculation of Kearns Number Plots (KNP) and Kearns Number Maps (KNM) from EBSD Data: Application to Ti-6Al-4V with Bimodal Microstructure: *Ayman Salem*¹; Adam Pilchak²; Surya Kalidindi³; ¹Materials Resources LLC; ²Air Force Research Laboratory; ³Drexel University

4:20 PM

The Study of Phase Transformation in Beta Titanium Alloys Using Electrical Resistivity Measurement, Image Processing Technique and Electron Microscopy: *Yufeng Zheng*¹; Robert Williams¹; Hamish Fraser¹; ¹The Ohio State University

4:40 PM

Phase Transformations and Mechanical Properties of Alpha-Beta Solution Treated Ti-6.8Mo-4.5Fe-1.5Al: *Jana Smilauerova*¹; Petr Hrcuba¹; Miloš Janeček¹; Josef Stráský¹; Radomír Kužel¹; Henry Rack²; Herbert Boeckels²; ¹Charles University; ²Clemson University

5:00 PM

Effect of Titanium Borides on the Formation of Equiaxed Alpha in Titanium Alloys: *Peeyush Nandwana*¹; Soumya Nag¹; Jaimie Tiley²; Hamish Fraser³; Rajarshi Banerjee¹; ¹University of North Texas; ²Air Force Research Laboratory; ³The Ohio State University

5:20 PM

Effect of Heating Rate on the Short Time Aging Kinetics of Ti-6.8Mo-4.5Fe-1.5Al: *Herbert Boeckels*¹; Henry Rack¹; ¹Clemson University

5:40 PM

Phase Evolution as a Function of Heat Treatment in Ti-48Al-16Nb Alloys: *Narayana Garimella*¹; A. K. Singh²; N.K. Mukhopadhyay³; G.V.S. Sastry³; ¹University of Maryland School of Medicine; ²Defence Metallurgical Research Laboratory Hyderabad India; ³Department of Metallurgical Engineering Banaras Hindu University India

T.T. Chen Honorary Symposium on Hydrometallurgy, Electrometallurgy and Materials Characterization: Transition Metal Processing

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee

Program Organizers: Shijie Wang, Rio Tinto Kennecott Utah Copper; J. E. Dutrizac, CANMET; Michael Free, University of Utah; J. Y. Hwang, Michigan Technological University; Daniel Kim, Rio Tinto Kennecott Utah Copper

Tuesday PM
March 13, 2012

Room: Oceanic 5
Location: Dolphin Resort

Funding support provided by: Rio Tinto Kennecott Utah Copper, ASARCO, and Freeport McMoRan

Session Chair: Michael Free, University of Utah

2:00 PM

FeTi Alloy Production by Electrolytic Reduction of (Fe, Ti) Oxide Electrode in Molten Calcium Chloride: *Panigrahi Mrutyunjay*¹; Atsushi Iizuka¹; Etsuro Shibata¹; Takashi Nakamura¹; ¹IMRAM, Tohoku University

2:20 PM

A New Method for Production of Titanium Dioxide Pigment – Eliminating CO₂ Emissions: *Scott Middlemas*¹; Z. Zak Fang¹; Peng Fan¹; ¹University of Utah

2:40 PM

Extraction of Titanium and Vanadium by Chloride Leach Processes: *Lucky V.I. Lakshmanan*¹; R. Sridhar¹; T. Sheikhezindin¹; Md. Halim¹; R. Roy¹; ¹Process Research Ortech Inc.

3:00 PM

Formation of Titanium Liquid Alloy by Mechanical Mixing and Electrochemical Method: *Sho Maruyama*¹; Shohei Hayashi¹; Yuya Kado¹; Tetsuya Uda¹; Yoshitaro Nose¹; ¹Kyoto university

3:20 PM Break

3:40 PM

Anion-Exchange Separation of Zr from Hf using Multi-Column Method: *Masahito Uchikoshi*¹; Kouji Mimura¹; Minoru Isshiki¹; ¹Tohoku University

4:00 PM

Recovery of Metals from Molybdenite Concentrate by Hydrometallurgical Technologies: *Yufang Wang*¹; Kaixi Jiang¹; Xiaoping Zou¹; Lei Zhang¹; Sanping Liu¹; ¹Beijing General Research Institute of Mining and Metallurgy

4:20 PM

The Effect of Phosphate Additions on the Microstructure and Performance of Cr₂O₃ Gasifier Refractories: *Kyei-Sing Kwong*¹; James Bennett¹; Jinichiro Nakano²; John Sears²; Xueyan Song³; ¹NETL, US DOE; ²URS Corp.; ³West Virginia University

4:40 PM

Extraction Impurities such as Fe, Ca and Mg from a Titanium Material in Chloride Acid System with Microwave Energy Leaching: *Shaohua Ju¹*; Jin-Hui Peng¹; Sheng-Hui Guo¹; Wang Xin¹; Lie-Xing Zhou¹; Meng-Yang Huang¹; ¹Kunming University of Science and Technology

5:00 PM

Study on Sodium Roasting and Chromium Extracting of Fe-Cr Spinels: Hai-Xing Fang¹; *Hong-Yi Li¹*; Bing Xie¹; ¹Chongqing University

Ultrafine Grained Materials VII: Processing-Microstructure-Property Relationships: Al-, Mg- and Ti-Alloys

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Xiaoxu Huang, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; Hyoung Seop Kim, POSTECH; Terence Langdon, University of Southern California; Terry Lowe, Manhattan Scientifics, Inc.; Ruslan Valiev, Ufa State Aviation Technical University; Xiaolei Wu, Institute of Mechanics, Chinese Academy of Sciences; Michael Zehetbauer, University of Vienna

Tuesday PM
March 13, 2012

Room: Swan 5
Location: Swan Resort

Session Chairs: David Morris, CENIM, CSIC; Edgar Garcia-Sanchez, Universidad Autónoma de Nuevo León; Jung Bahadur Singh, Bhabha Atomic Research Centre; Jozef Zrník, Comtes FHT, Inc.

2:00 PM Invited

Development of Ultra-High Strength Al-Mg Alloys Processed by Severe Plastic Deformation: *Hans Roven¹*; Manping Liu²; Maxim Murashkin³; Ruslan Valiev³; Tamas Ungár⁴; Levente Balogh⁴; ¹Norwegian University of Science and Technology (NTNU); ²Jiangsu University; ³Ufa State Aviation Technical University; ⁴Eötvös University

2:20 PM

Dynamic Precipitation in AA6060 during HPT Processing at Different Temperatures: *Gang Sha¹*; Xiaozhou Liao¹; Kaan Tugcu¹; Maxim Murashkin¹; Ruslan Valiev¹; Simon Ringer¹; ¹The University of Sydney

2:35 PM

ECAP Processing of Al5052 Alloys at Room and Cryogenic Temperatures: *Jung Singh¹*; Garima Sharma¹; Apu Sarkar¹; V Basavaraj²; Jayanta Chakravarty¹; ¹Bhabha Atomic Research Centre; ²IIT Bombay

2:50 PM

Effects on Hardening and Ductility of Severe Plastic Deformation of Al-Cu-Li and Cu-Cr-Zr Precipitation Hardening Alloys: *David Morris¹*; Kesman Valdes Leon¹; Maria Muñoz-Morris¹; ¹CENIM, CSIC

3:05 PM

Structural Evolution in Aluminium Alloy AA6082 during HPT Deformation at Increased Temperature: *Jozef Zrník¹*; Libor Kraus¹; Reinhard Pippan²; Martin Fujda³; Karel Sperlink⁴; ¹Comtes FHT, Inc.; ²Austrian Academy of Science; ³Technical University in Kosice; ⁴CSNMT

3:20 PM

Effect of Short Annealing and Ageing on Microstructure and Mechanical Properties of Ultrafinegrained Al-Mg-Si Alloy: *Nageswararao Palukuri¹*; Jayaganthan R¹; ¹IIT Roorkee

3:35 PM Break**3:50 PM Invited**

Nanostructure Evolution in Pure Aluminum Heavily Deformed by Torsion: *Nobuhiro Tsuji¹*; Sunisa Khamsuk¹; Hiroki Adachi²; Daisuke Terada¹; ¹Kyoto Univ; ²University of Hyogo

4:10 PM

Effect of the Severe Plastic Deformation on the Wear Behavior of an Al-Mg-Si Alloy: Edgar Ortiz-Cuellar¹; M. A. L Hernandez-Rodriguez¹; *E. Garcia-Sanchez²*; ¹Universidad Autónoma de Nuevo León -Facultad de Ingeniería Mecánica y Eléctrica

4:25 PM

Effect of Multi Directional Forging at Liquid Nitrogen Temperature on Microstructure and Mechanical Properties of Al-Mg-Si Alloy: *Jayaganthan R¹*; Nageswararao P¹; ¹IIT Roorkee

4:40 PM

Effect of Nano-Structural Modification on the Mechanical Behavior of Lamellar Gamma TiAl Alloy: *Yu Sun¹*; Anil Sachdev²; Enrique Lavernia¹; ¹University of California, Davis; ²Chemical Sciences and Materials Systems Lab, GM Global R&D Center, Warren, MI

4:55 PM

Development of Ultrafine Grained Mg-Y-RE Alloy by Multi Pass Friction Stir Processing: *S. K. Panigrahi¹*; R.S. Mishra¹; R. DeLorme²; B. Davis²; R. A. Howell³; K. Cho³; ¹Centre for Friction Stir Welding and Material science and Engineering; ²Magnesium Elektron North America Inc.; ³Weapons and Materials Research Directorate

5:10 PM

Microstructure and Defect Structure Evolution in Commercial Magnesium Alloys Processed by Severe Plastic Deformation: *Miloš Janeček¹*; Jakub Cížek¹; Jitka Vrátná¹; Julia Mueller¹; Jenő Gubiza¹; ¹Charles University

5:25 PM

Effect of HPT Processing Temperature on the Evolution of Strength in a Magnesium Alloy: *Yi Huang¹*; Roberto Figueiredo²; Terence Langdon³; ¹University of Southampton; ²Federal University of Minas Gerais; ³University of Southern California

5:40 PM

Some Studies on the Microstructural Changes in a Mg-Based AE42 Alloy Subjected to Friction Stir Processing: Brij Dhindaw¹; Harpreet Singh¹; *Harpreet Singh Arora¹*; ¹I.I.T. Ropar



TMS 2012

141st Annual Meeting & Exhibition

Ultrafine Grained Materials VII: Processing-Microstructure-Property Relationships: Fe-, Cu- and High-Entropy Alloys

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Xiaoxu Huang, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; Hyoung Seop Kim, POSTECH; Terence Langdon, University of Southern California; Terry Lowe, Manhattan Scientifics, Inc.; Ruslan Valiev, Ufa State Aviation Technical University; Xiaolei Wu, Institute of Mechanics, Chinese Academy of Sciences; Michael Zehetbauer, University of Vienna

Tuesday PM
March 13, 2012

Room: Swan 4
Location: Swan Resort

Session Chairs: Tadahiko Furuta, Toyota Central R & D Labs., Inc.; Rainer Hebert, University of Connecticut; Rimma Lapovok, Monash University; Z.B. Wang, Institute of Metal Research, Chinese Academy of Sciences

2:00 PM Invited

Structure and Properties of the Stainless Cr-Ni-Ti Steel after High Pressure Torsion at T= 300-500°C: *Sergey Dobatkin*¹; Ruslan Valiev²; Olga Rybalchenko¹; Maksim Murashkin²; ¹A.A. Baikov Institute of Metallurgy and Materials Science of RAS; ²Ufa State Aviation Technical University

2:20 PM

Effect of Alloy Composition on Mechanical Properties of Bulk Nanostructured Fe-Ni-Co-Ti Alloys Produced by High-Pressure Torsion: *Tadahiko Furuta*¹; Shigeru Kuramoto¹; Kaveh Edalati²; Zenji Horita²; ¹Toyota Central R & D Labs., Inc.; ²Kyushu University

2:35 PM

Synthesis and Characterization of Nanocrystalline High Entropy Alloys: *Koteswararao Rajulapati*¹; P Chandrashekar¹; M Sundararaman¹; K Bhanu Sankara Rao¹; ¹University of Hyderabad

2:50 PM Invited

Influence of Strain Path on the Fracture Behavior of Severely Plastically Deformed Iron: *Anton Hohenwarter*¹; Reinhard Pippan¹; ¹Erich Schmid Institute of Materials Science, Austrian Academy of Sciences

3:10 PM

Microstructure Evolution and of a F138 Austenitic Stainless Steel after Severe Plastic Deformation: *Andrea Klika*¹; Sergey Dobatkin²; ¹Universidade Federal de São Carlos - UFSCar; ²Baikov Institute of Metallurgy and Materials Science RAS

3:25 PM

Grain Size Effect on High Speed Deformation of Hadfield Steel: *Rintaro Ueji*¹; Daisuke Kondo¹; Yoshinori Takagi¹; Takashi Mizuguchi¹; Yasuhiro Tanaka¹; Kazunari Shinagawa¹; ¹Kagawa University

3:40 PM

Austenitization Process in a Nanostructured Ferritic Steel Produced by Means of Surface Mechanical Attrition Treatment: *Z.B. Wang*¹; L.M. Wang¹; K. Lu¹; ¹Institute of Metal Research, Chinese Academy of Sciences

3:55 PM Break

4:10 PM Invited

Recent Progress in High-Entropy Alloys: *Ming-Hung Tsai*¹; Jien-Wei Yeh²; ¹North Carolina State University; ²National Tsing Hua University

4:30 PM

Refinement of Second Phase Particles in Creep-Resistant Iron Aluminides using High-Temperature Severe Plastic Deformation: *David Morris*¹; Maria Muñoz-Morris¹; ¹CENIM, CSIC

4:45 PM

Thickness Effect in Micro Drawing of Ultrafine and Coarse Grained Cooper: *Andrey Molotnikov*¹; *Rimma Lapovok*¹; Chengfan Gu¹; Chris Davies¹; Yuri Estrin¹; ¹Monash University

5:00 PM

Accumulative Roll Bonding of Cu-Mo Multilayers: Mechanical Property-Microstructure Relations: *Girija Marathe*¹; *Rainer Hebert*¹; ¹University of Connecticut

5:15 PM

Combination of DRECE Process and Heat Treatment to Achieve Refining Structure of Brass: *Stanislav Rusz*¹; Karel Malanik²; Jan Kedron¹; Jan Dutkiewicz³; Lubomir Cizek¹; Stanislav Tylsar¹; Michal Salajka¹; ¹VSB - Technical University of Ostrava; ²VUHZ a.s.; ³Institute of Metallurgy and Materials Science of Polish Academy of Sciences

5:30 PM

Microstructural Evolution and Mechanical Behaviour of Warm Multi-Axially Forged HSLA Steel: *Aditya Padap*¹; G Chaudhari²; V Pancholi²; S Nath²; ¹Bundelkhand Institute of Engineering and Technology Jhansi, UP India 284128; ²Indian Institute of Technology Roorkee, India

2012 Functional and Structural Nanomaterials: Fabrication, Properties, Applications and Implications: Nanomaterials for Energy Technology

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Jiyoung Kim, University of Texas; David Stollberg, Georgia Tech Research Institute; Seong Jin Koh, University of Texas at Arlington; Nitin Chopra, The University of Alabama; Terry Xu, UNC Charlotte

Wednesday AM
March 14, 2012

Room: Pelican 1
Location: Swan Resort

Session Chairs: Terry Xu, Univ. North Carolina at Charlotte; Deyu Li, Vanderbilt University

8:30 AM Introductory Comments

8:35 AM Invited

Selected Synthesis Techniques of Thermoelectric Nanomaterials and Their Role in Higher Performance Thermoelectric Materials: *Terry Tritl¹*; Jennifer Graff¹; Wenjie Xie²; Xinfeng Tang³; ¹Clemson University; ²Wuhan University of Technology; ³Wuhan University of Technology

9:10 AM Invited

Thermal Transport Through Individual Nanowires/Nanotubes and Their Contacts: *Deyu Li¹*; ¹Vanderbilt University

9:45 AM

Structure and Thermomechanical Behavior of Nanoporous Nickel Thin Films: *Lei Wang¹*; Jiang Xu¹; ¹University of Kentucky

10:00 AM Break

10:15 AM Invited

All Inorganic "Sensitized" Solar Cells Based on Large Bandgap Semiconductors: *Yong Zhang¹*; ¹UNC Charlotte

10:50 AM

Catalytic Properties of AgCu Bimetallic Nanoparticles for PEMFC Cathode: DFT Study: Kihyun Shin¹; Da Hye Kim¹; Sang Chul Yeo¹; *Hyuck Mo Lee¹*; ¹KAIST

11:05 AM

High-Performance Electrochemical Capacitors Based on Nanocomposites of Transition Metal Oxide Aero-Gel / Vertically Aligned Carbon Nanotubes: *Minsub Oh¹*; Younghak Song¹; Sangmin Kim²; Haseok Jeon¹; Ju Hee Kim³; Haekyoung Kim³; Seungmin Hyun²; Hoo-jeong Lee¹; ¹Sungkyunkwan University; ²Korea Institute of Machinery & Materials; ³Yeungnam University

11:20 AM

3D Multiwall Carbon Nanotubes (MWCNTs) for Li-Ion Battery Anode: *Chiwon Kang¹*; Indrani Lahiri¹; Rangasamy Baskaran²; Mansoo Choi²; Won Gi Kim²; Yang-Kook Sun²; Wonbong Choi¹; ¹Nanomaterials and Device Laboratory, Department of Mechanical and Materials Engineering, Florida International University, USA; ²Department of Energy Engineering, Hanyang University, Seoul, Korea

2012 Symposium on Surfaces and Heterostructures at Nano- or Micro-Scale and Their Characterization, Properties, and Applications: I-Energy II-Magnetic Materials III-Chemical Sensing and Surfaces

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Energy Conversion and Storage Committee, TMS: Nanomaterials Committee, TMS: Surface Engineering Committee, TMS: Young Leaders Committee, TMS: EMPMD Council
Program Organizers: Nitin Chopra, The University of Alabama; Ramana Reddy, The University of Alabama; Arvind Agarwal, Florida International University; Sandip Harimkar, Oklahoma State University; Jiyoung Kim, University of Texas at Dallas; Christopher Matranga, National Energy Technology Laboratory

Wednesday AM
March 14, 2012

Room: Pelican 2
Location: Swan Resort

Session Chairs: Sumit Chaudhary, Iowa State University; Nitin Chopra, The University of Alabama; Jiyoung Kim, University of Texas at Dallas

8:30 AM

Transport and Electrical Properties of Two Dimensional Hole Gas in δ -MIGFET in GaAs: *Outmane Oubram¹*; Oracio Navarro Chávez²; Luis Manuel Gaggero-Sager³; ¹Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México; ²Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México; ³Facultad de Ciencias, Universidad Autónoma del Estado de Morelos

8:45 AM

Electrochemical Behavior of Nanoceria in Different pH Solution: *Shashank Saraf¹*; Naveen Chandrasekaran¹; Sudipta Seal¹; ¹University of Central Florida

9:00 AM

Facile Preparation and Advanced Characterization of ZnO Nanoparticles: *Hulya Kaftelen¹*; Kasim Ocakoglu¹; Emre Erdem²; ¹Mersin University; ²Institut für Physikalische Chemie I, Albert-Ludwigs-Universität Freiburg

9:15 AM Invited

Spherical Barium Ferrite (S-BaFe) Nanoparticles for Ultra High-Density Information Data Storage: *Yang-Ki Hong¹*; Jeevan Jalli¹; Sung-Hoon Gee²; ¹The University of Alabama; ²Seagate Technologies

9:50 AM Invited

Perpendicular Magnetic Tunnel Junctions for Spin-Torque Transfer Random Access Memory (STT-RAM): *Subhadra Gupta¹*; Anusha Natarajarathinam¹; Amritpal Singh¹; ¹The University of Alabama

10:25 AM Break

10:30 AM Invited

Nanocomposite Soft Magnetic Materials: Role of Composition on Properties(Invited): *Matthew Willard¹*; Maria Daniil²; Keith Knipling¹; ¹Naval Research Laboratory; ²George Washington University

11:05 AM Invited

Optical Thin Films for Gas Sensing in Advanced Coal Fired Power Plants: *Paul Ohodnicki¹*; Thomas Brown¹; John Baltrus¹; Sittichai Natesakhawat²; Congjun Wang³; ¹National Energy Technology Laboratory; ²National Energy Technology Laboratory and University of Pittsburgh; ³National Energy Technology Laboratory and URS Corporation



TMS 2012

141st Annual Meeting & Exhibition

11:40 AM

Hierarchical Metallic and Ceramic Nanostructures via a Hybrid Approach Combining Laser Interference Ablation and Block Copolymer Phase Separation: *Taiwo Alabi*¹; Dajun Yuan¹; Suman Das¹; ¹Georgia Institute of Technology

11:55 AM

Rapid Fabrication of Diverse Two-Dimensional and Three-Dimensional Gold Nanostructures Through Laser Interference Patterning: *Dajun Yuan*¹; Suman Das¹; ¹Georgia Institute of Technology

12:15 PM Invited

Development of Superhydrophobic Nano-structured Ceramics to Promote Dropwise Condensation: *Ghazal Azimi*¹; Kripa Varanasi¹; ¹MIT

3rd International Symposium on High Temperature Metallurgical Processing: Sintering and Synthesis

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Energy Committee, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Patrick Masset, TU Freiberg; Onuralp Yucel, Istanbul Technical University; Rafael Padilla, University of Concepcion; Guifeng Zhou, Wuhan Iron and Steel

Wednesday AM
March 14, 2012

Room: Southern II
Location: Dolphin Resort

Session Chairs: Mark Schwarz, CSIRO; Xiaohui Fan, Central South University

8:30 AM

A Study of Co-V-Al Alloys by Self Propagating High Temperature Synthesis: *Murat Alkan*¹; Ozlem Altinordu¹; Seref Sönmez¹; Onuralp Yücel¹; Bora Derin¹; Vladimir Sanin²; Vladimir Yuxhvid²; ¹Istanbul Technical University; ²Institute of Structural Macrokinetics and Materials Sciences

8:45 AM

Strengthening the Sintering of Iron Concentrate Fines by High Pressure Roller Grinding Pretreatment: *Yufeng Guo*¹; Kelang Mu¹; Jiang Tao¹; Dao Su¹; Jinghua Zeng¹; ¹Central South University

9:00 AM

A Study of Ni-Cr-Al Alloys by Self-Propagating High Temperature Synthesis: *Bora Derin*¹; Ozlem Altinordu¹; Murat Alkan¹; Seref Sonmez¹; Onuralp Yucel¹; Vladimir Sanin²; Vladimir Yuxhvid²; ¹Istanbul Technical University; ²Institute of Structural Macrokinetics and Materials Sciences, ISMAN

9:15 AM

Research on Sintering Properties of Vanadium-Titanium Magnetite Concentrate: *Xiaohui Fan*¹; Qiang Wang¹; Xuling Chen¹; Min Gan¹; Lishun Yuan¹; Shan He¹; ¹Central South University

9:30 AM

Influence of Limonite Proportion on Sinter Quantity and Quality: *Xiaohui Fan*¹; Dao Su¹; Ganghua Fu¹; Xuling Chen¹; Min Gan¹; Tao Jiang¹; Yufeng Guo¹; ¹Central South University

9:45 AM

In Situ Observation of High Temperature Properties of Iron Ore during Sintering Process: *Pei Dong*¹; ¹Shougana China

10:00 AM Break

10:10 AM

The Influence of m(V2O5)/m(TiO2) on Compositions and Structures of V-Ti-Fe Alloys: *Bin Wang*¹; Kuiren Liu¹; Jianshe Chen¹; Jilin He²; ¹Northeastern University; ²Northwest Rose Metal Materials Research Institute

10:25 AM

Air Leakage Online Monitoring and Diagnosis Model for Sintering: *Fan Xiaohui*¹; Jiang Lijuan¹; Chen Xuling¹; ¹Central South University

10:40 AM

Investigation on the Interfaces of M42/45 Steel Bimetal Composites Sintered by Spark Plasma Sintering: Xu Jinfu¹; You Hang¹; ¹Institute of Materials Engineering, Ningbo University of Technology

10:55 AM

Influence of MgO on the Strength of High Basicity Sinter: Xiaohui Fan¹; *Wenqi Li*¹; Min Gan¹; Guohua Bai¹; Tao Jiang¹; Zhiyun Ji¹; Zhiyuan Yu¹; Xiaoxian Huang¹; ¹Central South University

Advances in Surface Engineering: Alloyed and Composite Coatings: Session V

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Surface Engineering Committee

Program Organizers: Sandip Harimkar, Oklahoma State University; Srinivasa Bakshi, Indian Institute of Technology Madras; Arvind Agarwal, Florida International University

Wednesday AM
March 14, 2012

Room: Macaw 1
Location: Swan Resort

Session Chair: To Be Announced

8:30 AM

Tribological Behavior of Plasma Sprayed Al-Si Composite Coatings Reinforced with Different Carbon Allotropes: *Mingdong Bao*¹; Cheng Zhang¹; Debrupa Lahiri¹; Arvind Agarwal¹; ¹Florida International University

8:50 AM

Evaluation of Brittle Layers Obtained on Boronized Cr-Mo Based Steels

: *Noe Lopez Perrusquia*¹; Marco Doñu Ruiz¹; ¹Instituto Politécnico Nacional

9:10 AM

Evaluation of Residual Stress in Fe2B Coating on Ductile Cast Iron: *Marco Doñu Ruiz*¹; Noe Lopez Perrusquia¹; Victor Jorge Cortez Suarez²; David Leoncio Rosado Cruz³; ¹IPN; ²UAM; ³UPVM

9:30 AM Break

9:45 AM

Regression Model of Oxidation Behavior of 6061 Al/SiC Composite: *Priyamvada Bhaskar*¹; ¹National Institute of Technology, Surathkal

10:05 AM

An Alternative Solution for Aluminium Extrusion Die Surfaces: The Qualified Hard Coatings (AlCrN and AlTiN): *Behiye Yuksel*¹; Yucel Birol¹; ¹TUBITAK MAM Materials Institute

10:25 AM

On the Production of Mo-MoSi2 FGM by Diffusion Technology: *Ma Ruixin*¹; Li Shina¹; Zhang Juping¹; ¹USTB

WEDNESDAY AM

Alumina and Bauxite: Energy and Processing Alternative Rawmaterials

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Benny Raahaage, FLSmidth

Wednesday AM Room: Northern E3
March 14, 2012 Location: Dolphin Resort

Session Chair: Tony Kjar, Gibson Crest Pty Ltd

8:30 AM

Decrease of Heat Consumption at Nepheline Processing to Alumina and By-Products: Vladimir Kazakov¹; *Vadim Lipin*²; ¹St. Petersburg State Technologic University of Vegetable Polymers; ²Saint Petersburg State Polytechnical University

8:50 AM

Influence of Na₂O on the Phase Compositions and the Alumina Leaching Properties of Calcium Aluminate Slag: *Yingjie Li*¹; Z. F. Tong²; Lixiu Lian¹; ¹Jiangxi University of Science and Technology; ²Jiangxi University of Science and Technology

9:10 AM

Influence of Titania on the Phase Compositions and the Alumina Leaching Properties of Calcium Aluminate Slag: *Z. F. Tong*¹; Yingjie Li²; Lixiu Lian²; ¹Jiangxi University of Science and Technology; ²Jiangxi University of Science and Technology

9:30 AM

Research of Al and Si Occurrence States on Acid Leaching Performance of High-Alumina Fly Ash: Zhang Ting'an¹; *Lv Guozhi*¹; Dou Zhihe¹; Nan Xiangli; Song Dan¹; Li Yan¹; He Jicheng¹; ¹Northeastern University

9:50 AM

Study on the Effect of Si and Silicide on Leaching Al₂O₃ from Magnesium Smelting Reduction Slag: You Jing¹; *Wang Yaowu*¹; Feng Naixiang¹; Peng Jianping¹; Di Yuezhong¹; ¹Northeastern University

10:10 AM

Extracting Alumina from Coal Fly Ash Using Acid Sintering-Leaching Process: *Kang Liu*¹; Jilai Xue¹; ¹University of Science and Technology Beijing

10:30 AM

Study on Secondary Reaction Mechanism during Alumina Leaching Process of Calcium Aluminate Slag: *Wang Bo*¹; Sun Hui-Lan²; Yu Hai-Yan¹; Pan Xiao-Lin¹; Tu Gan-Feng¹; ¹Northeastern University; ²Hebei University of Science and Technology

10:50 AM

Production of Novel Zeolite of Type Na-P from Sodium Aluminate Liquor/Spent Liquor/Alumina Tri-Hydrate of Nalco's Alumina Refinery, Damanjodi, Orissa, India: A Unique Builder Material for Detergent Formulation: *Chitta Mishra*¹; ¹National Aluminium Company Limited

Aluminum Alloys: Fabrication, Characterization and Applications: Material Characterization

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Processing Committee
Program Organizers: Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum

Wednesday AM Room: Northern E1
March 14, 2012 Location: Dolphin Resort

Session Chair: William Golumbfskie, Naval Surface Warfare Center

8:30 AM

Characterization of High Strength Wrought and Rapidly Solidified Al Alloys for Aero Engine Applications: *Eric Ott*¹; ¹GE Aviation

8:50 AM

Metallographic Identification of Phases in 5xxx Series Aluminum Alloys: *Young-Ki Yang*¹; Todd Allen¹; ¹University of Wisconsin

9:10 AM

Studies on Flow Characteristics at High-Pressure Die-Casting: *Christian Chimani*¹; Richard Kretz¹; Simon Schneiderbauer²; Stefan Puttinger²; Stefan Pirker²; ¹LKR Leichtmetallkompetenzzentrum Ranshofen GmbH; ²JKU Johannes Kepler Universität

9:30 AM

Electrohydraulic Sheet Metal Forming of Aluminum Panels: *John Bonnen*¹; Sergey Golovoshchenko¹; Scott Dawson¹; Alexander Mamutov²; Alan Gillard¹; ¹Ford Motor Company; ²Oakland University

9:50 AM

Forming of AA7075 under Cryogenic Conditions: *Sebastian Fritsch*¹; Stephanie Hunger¹; Matthias Hockauf¹; Martin F.-X. Wagner¹; ¹Chemnitz University of Technology

10:10 AM Break

10:25 AM

Metallurgical Characterization of Aluminum Alloys by Matrix Dissolution: *Marcelo Paes*¹; Francisco Pinheiro¹; Miguel Borodiak¹; ¹Votorantim Metais - CBA

10:45 AM

Effect of Silicon Particles on the Tensile Properties of Heat Resistant Al-Si-Cu-Ni-Mg Alloy Pertaining to Different Tensile Temperature: *Chuang Hsu-Chi*¹; Lui Truan-Sheng¹; Chen Li-Hui¹; ¹National Cheng Kung University

11:05 AM

Work-Hardening and Flow Behavior of AA7055 Alloy Extrusions: *Geo Harrison*¹; Rama Krishna²; Tejaswini²; Chandan Monadal³; ¹College of Engineering Guindy, Anna University; ²JNTU College of Engineering; ³Defence Metallurgical Research Laboratory, Hyderabad.

11:25 AM

Factors Influencing Tensile Mechanical Properties of Al-7Si-Mg Casting Alloys A356/7: *Heinrich Moller*¹; Waldo Stumpf²; Gonasagren Govender¹; ¹CSIR; ²University of Pretoria



TMS 2012

141st Annual Meeting & Exhibition

Aluminum Reduction Technology: Cell Technology and Operation

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee

Program Organizer: Olivier Martin, Rio Tinto Alcan

Wednesday AM
March 14, 2012

Room: Southern III
Location: Dolphin Resort

Session Chair: Bjørn Moxnes, Hydro Aluminium

8:30 AM

DX+, An Optimized Version of DX Technology: *Abdalla Al Zarouni*¹; Ali Al Zarouni¹; Michel Reverdy¹; Sergey Akhmetov¹; Lalit Mishra¹; Nadia Ahli¹; Ibrahim Baggash¹; ¹DUBAL

8:50 AM

AP40 : The Latest of the AP Technology™ Solutions: *Laurent Fiot*¹; Benedicte Champel¹; Sylvain Fardeau¹; Pierre Bon¹; David Munoz¹; Olivier Martin¹; ¹Rio Tinto Alcan

9:10 AM

A Techno-Economic Optimization Model For Aluminum Electrolysis Production: Yanfang Zhang¹; *Wangxing Li*¹; Jianhong Yang¹; Dengpeng Chai¹; Shilin Qiu¹; Jingyi Li²; ¹Zhengzhou Research Institute of Chalco; ²Graduate School of Business and Law, RMIT

9:30 AM

The Successful Implementation of DUBAL DX Technology at EMAL: *Michel Reverdy*¹; B. Kakkar²; David Spencer²; Walid Al Sayed²; Ali Al Zarouni¹; Kamel Al Aswad¹; Abdalla Al Zarouni¹; ¹DUBAL; ²EMAL

9:50 AM

Commissioning of Emirates Aluminium Smelter Potlines: *B.K. Kakkar*¹; Spencer¹; Walid Al Sayed¹; Salman Abdulla¹; ¹Emirates Aluminum company

10:10 AM Break

10:30 AM

Update on the Development of D18 Cell Technology at Dubal: *Daniel Whitfield*¹; Tariq Majeed¹; Sergey Akhmetov¹; Maryam Mohamed Al-Jallaf¹; Kamel Al-Aswad¹; Ibrahim Baggash¹; Ali Al-Zarouni¹; ¹Dubai Aluminium

10:50 AM

Prebake Potline Restart after Power Supply Interruption: *Mikhail Lukin*¹; John Johnson²; ¹Kubikenborg Aluminium AB; ²RUSAL ETC

11:10 AM

The Restart of Two Idled Pot Lines at Ormet Primary Aluminum: *Cecil Smith*¹; Mark Christman¹; ¹Ormet Primary Aluminum

11:30 AM

Vertical Stud Søderberg Technology Development by UC RUSAL in 2004 -2010: *V.Yu. Buzunov*¹; Victor Mann²; Evgeniy Chichuk¹; Nikolay Pitertsev²; Igor Cherskikh¹; Vladimir Frizorger¹; ¹RUSAL ETC; ²UC RUSAL

11:50 AM

Uniform Cathode Current Collection / Distribution Effect on Cell Stability (Nine Months of Continuous Treatment of a Sick Cell): *Hadi Fanisalek*¹; ¹Hormozal

Atomistic Effects in Migrating Interphase Interfaces - Recent Progress and Future Study: Modelling and Mechanisms of Interface Migration

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Tadashi Furuwara, Institute for Materials Research, Tohoku University; Sudarsanam Babu, Ohio State University; Hatem Zurob, McMaster University; Jian-Feng Nie, Monash University; Wen-Zheng Zhang, Tsinghua University; James Howe, University of Virginia

Wednesday AM
March 14, 2012

Room: Europe 3
Location: Dolphin Resort

Session Chairs: Sybrand van der Zwaag, Technical University Delft; Mohamed Gouné, ArcelorMittal Maizières Research SA

8:30 AM Invited

Effects of Alloying Elements on the Growth of Ferrite from Austenite In Multi-Component Fe-C Base Alloys: *Masato Enomoto*¹; Ran Wei¹; Guohong Zhang²; Dongwoo Suh²; ¹Ibaraki University; ²Pohang University of Science and Technology

9:00 AM Invited

Modeling of the Austenite to Ferrite Transformation in Fe-C-X Alloys: *Joakim Odqvist*¹; Annika Borgenstam¹; Henrik Larsson²; Lars Höglund¹; John Ågren¹; Mats Hillert¹; ¹KTH (Royal Institute of Technology); ²Thermo-Calc Software AB

9:30 AM

New Model for Kinetics of the “ γ ” to “ α ” Transformation in Fe-C-X Systems: *Damon Panahi*¹; Hatem Zurob¹; Gary Purdy¹; Christopher Hutchinson²; Yves Brechet³; ¹McMaster University; ²Monash University; ³Grenoble Institute of Technology

9:50 AM Break

10:05 AM Invited

Precise Measurements of Phase Transformation Kinetics: What Can It Tell Us about the Atomic Mechanisms of Interface Migration?: *Christopher Hutchinson*¹; Hatem Zurob²; ¹Monash University; ²McMaster University

10:35 AM Invited

Direct Computation of the Solute Drag on a Moving Interface using Atomistic Simulations: H. Humadi¹; Y. Yang²; D. Buta³; B. B. Laird²; D.Y. Sun⁴; *Jeffrey Hoyt*¹; M. Asta⁵; ¹McMaster University; ²University of Kansas; ³University of California, Davis; ⁴East China Normal University; ⁵University of California, Berkeley

11:05 AM

Atomistic Simulations of Solute-Interface Interactions in Iron: *Hao Jin*¹; Ilya Elfimov¹; Matthias Militzer¹; ¹The University of British Columbia

11:25 AM

Atomistic Modelling of Interstitial Solute Interacting with Moving Interface: *Aulia Wicaksono*¹; Matthias Militzer¹; Chad Sinclair¹; ¹UBC

**Biological Materials Science Symposium:
Biological and Bio-Inspired Materials III: Soft
Biomaterials**

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Nima Rahbar, University of Massachusetts Dartmouth; Candan Tamerler, University of Washington; Po-Yu Chen, University of California, San Diego; Molly Gentleman, Texas A&M University

Wednesday AM
March 14, 2012

Room: Swan 7
Location: Swan Resort

Session Chairs: Molly Kennedy, Clemson University; Molly Gentleman, Texas A&M University

8:30 AM Invited

A Detailed Physicochemical Study of Peptide-Mineral Interactions; Importance of Peptide Composition, Particle Size, Surface Chemistry, pH and Buffer Identity: *Carole Perry*¹; Valeria Puddu¹; David Belton¹; Nottingham Trent University

9:00 AM

Specific Targeting Molecular Probes: From Materials to Cells: Hilal Yazici¹; Marketa Hnilova¹; Hanson Fong¹; Hai Zhang¹; Candan Tamerler¹; ¹University of Washington

9:20 AM

Possible Key Property of Nanoparticles that Can Maximize Its Cancer Killing Capacity: *Vanessa Moosavifazel*¹; Soumen Das²; Sudipta Seal²; ¹University Central Florida ; ²University Central Florida

9:40 AM

Response of Mice 7F2 Osteoblast and Porcine Dental Pulp Stem Cells to Substrate Topography: *Marian Kennedy*¹; Xue Chen¹; Terri Bruce¹; Delphine Dean¹; Julia Sharp¹; ¹Clemson University

10:00 AM

Determination of Mechanical Properties in Escherichia Coli by Nanoindentation: *Cody Wright*¹; Abdelmageed Elmustafa¹; Claretta Sullivan²; ¹Old Dominion University; ²Eastern Virginia Medical School

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

Measurement of the Cell Adhesion Strength of Patterned Fibroblasts Using Hydrodynamically-Confined Microfluidics: *Kevin Turner*¹; Kevin Christ²; ¹University of Pennsylvania; ²University of Wisconsin-Madison

10:55 AM

The Role of Surface Free Energy of Cell Adhesion in TiO₂ Systems: Eileen Gentleman¹; Kyle Krzywosinski²; Matthew Scorsone²; *Molly Gentleman*²; ¹King's College London; ²Texas A&M University

11:15 AM

Mechanical Response of Brain Tissue Surrogate Material under Impact Loading: Marius Ellingsen¹; *Deepthi Saini*¹; Karim Muciküchler¹; Brandon Hinz¹; ¹South Dakota School of Mines and Technology

11:30 AM

Photocatalytic Responses of Bacterial Cells: J. Zhang¹; X. Wang¹; P. Wu²; Q. Li¹; *J. Shang*³; ¹Institute of Metal Research; ²Superior Graphite Co.; ³University of Illinois

11:45 AM

Polydimethylsiloxane Mechanical Properties and Their Effects on Cell Growth: *Zhixin Wang*¹; Kranthi Elineni¹; Nathan Gallant¹; Alex Volinsky¹; ¹University of South Florida

Bulk Metallic Glasses IX: Fatigue and Corrosion

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

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

Wednesday AM
March 14, 2012

Room: Swan 6
Location: Swan Resort

Session Chairs: Yoshikazu Nakai, Kobe University; Despina Louca, University of Virginia

8:30 AM Invited

On the Fatigue Strength of Monolithic and Composite Bulk-Metallic Glasses: Bernd Gludovatz¹; Marios Demetriou²; Maximilien Launey³; Douglas Hofmann²; William Johnson²; *Robert Ritchie*¹; ¹Lawrence Berkeley National Laboratory; ²California Institute of Technology; ³NDC

8:50 AM

Surface Coating of Zr-Based Metallic Glass Film for the Fatigue Property Improvements of Ti-6Al-4V Alloy: *Cheng-Min Lee*¹; J. P. Chu¹; ¹National Taiwan University of Science and Technology

9:00 AM Invited

Environment Assisted Cracking of Zr-Based Bulk Metallic Glass in the Region near Threshold: *Yoshikazu Nakai*¹; Toyohiko Koyama¹; ¹Kobe University

9:20 AM Invited

Statistical Modeling of Fatigue for Zr₅₅Cu₃₀Ni₅Al₁₀ Bulk-Metallic Glass: *D Gary Harlow*¹; Yoshihiko Yokoyama²; ¹Lehigh University; ²Tohoku University

9:40 AM Break**9:55 AM Invited**

Understanding Fatigue Resistance in Bulk Metallic Glasses: *Jamie Kruczic*¹; ¹Oregon State University

10:15 AM

The Study of Fatigue-Induced Damage in Zr-Based Bulk Metallic Glasses: *Chih-Pin Chuang*¹; Wojciech Dmowski¹; Wei Guo¹; Gongyao Wang¹; Peter Liaw¹; Takeshi Egami¹; Yoshihiko Yokoyama²; Ran Li³; Tao Zhang³; ¹University of Tennessee; ²Tohoku University; ³Beihang University

10:25 AM

The Atomic Structure Changes of a Metallic Glass under Creep and Fatigue Loadings: *Wei Guo*¹; Wojciech Dmowski¹; Andrew Chuang¹; Gongyao Wang¹; Yoshihiko Yokoyama²; Yang Ren³; Peter Liaw¹; Akihisa Inoue²; Takeshi Egami¹; ¹University of Tennessee, Knoxville; ²Tohoku University; ³Argonne National Lab

10:35 AM Invited

Characterization of Shear Bands and Cracks Induced by Three-Point Bending Fatigue Test in Zr-Cu-Al Bulk Metallic Glass: *Pei-Ling Sun*¹; Gongyao Wang²; Peter Liaw²; Feng Chia University; ²University of Tennessee, Knoxville

10:55 AM Invited

Static and Cyclic Deformation Effects on the Thermomechanical Behavior of Bulk Metallic Glass: *Rainer Hebert*¹; Arif Mubarak¹; Gongyao Wang²; Peter Liaw²; Yoshihiko Yokoyama³; Akihisa Inoue³; ¹University of Connecticut; ²University of Tennessee at Knoxville; ³Tohoku University



TMS 2012

141st Annual Meeting & Exhibition

11:15 AM Invited

Fatigue Behavior of Zr-Based Metallic Glass at Micro- and Nano-Scales: *Dongchan Jang*¹; Peter Liaw²; Gongyao Wang²; Julia Greer¹; ¹California Institute of Technology; ²University of Tennessee

11:35 AM

Thermography Study of Fatigue on Different Amorphous Alloy Systems: *Gongyao Wang*¹; Q. M. Feng¹; M. D. Demetriou²; Y. Yokoyama³; P. Liaw¹; W. L. Johnson²; A. Inoue³; ¹University of Tennessee; ²California Institute of Technology; ³Tohoku University

11:45 AM Invited

A Study of Corrosion Behavior of Zr-Based Metallic Glass Thin Films Deposited by Pulsed DC Magnetron Sputtering Technique: *Yi-Chia Liao*¹; *Jyh-Wei Lee*²; Ching-Yen Chung²; Chia-Lin Li³; Jenq-Gong Duh⁴; Jinn P. Chu³; ¹Tungnan University; ²Ming Chi University of Technology; ³National Taiwan University of Science and Technology; ⁴National Tsing Hua University

12:05 PM

Utilization of Electrochemical Dissolution Processes for Micro Machining of Bulk Metallic Glasses: *Annett Gebert*¹; *Jakub Kozal*¹; *Ralph Suepitz*²; Margitta Uhlemann¹; Jürgen Eckert¹; Ludwig Schultz¹; ¹IFW Dresden

Cast Shop for Aluminum Production: Dross and Melt Quality Control

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Trond Furu, Hydro

Wednesday AM
March 14, 2012

Room: Northern A4
Location: Dolphin Resort

Session Chair: Gerd-Ulrich Gruen, Hydro

8:30 AM

A New Approach to Identify Aluminum Dross Reduction Opportunities Using an Integrated Weighing System: *Simon L'Heureux*¹; Vincent Goutière¹; Joseph Langlais¹; David-Alexandre Tremblay¹; Peter Waite¹; ¹Rio Tinto Alcan

8:50 AM

Statistical Analysis of Dross Data for Hydro Aluminium Casthouses: *Christian Rosenkilde*¹; *Inge Johansen*¹; Amanda Bowles¹; ¹Hydro Aluminium

9:10 AM

Wettability of Aluminium with Aluminium Carbide (Graphite) in Aluminium Filtration: *Sarina Bao*¹; Kai Tang²; Anne Kvithyld²; Thorvald Engh¹; Merete Tangstad¹; ¹NTNU; ²SINTEF

9:30 AM

A New Fused Magnesium Chloride Containing Refining Flux Based on a Ternary System: *John Courtenay*¹; ¹MQP Limited

9:50 AM Break

10:10 AM

High Frequency Electromagnetic Separation of Inclusions from Aluminum: *Lucas Damoah*¹; Lifeng Zhang¹; ¹Missouri University of Science and Technology

10:30 AM

Measurement of Non-Metallic Inclusions in the Size Range of 10-20µm by LIMCA: *Mark Badowski*¹; Stephen Instone¹; ¹Hydro Aluminium

10:50 AM

Relationship between the Permeability of the Porous Disk Filter and the Filtrate Weight-Time Curves Generated with the PoDFA / Prefil® Footprinter Method: *Stephen Instone*¹; Daniel Krings¹; Gerd-Ulrich Gruen¹; Roland Schmoll¹; Mark Badowski¹; ¹Hydro Aluminium Rolled Products GmbH

11:10 AM

Study of Ni-Impurity Removal from Al Melt: *Muhammad Akbar Rhamdhani*¹; Mohammad Dewan¹; Jason Mitchell¹; Cameron Davidson¹; Geoffrey Brooks¹; Mark Easton¹; John Grandfield¹; ¹CAST CRC

11:30 AM Break

CFD Modeling and Simulation in Materials Processing: Modeling of Casting and Solidification Processes II

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
Program Organizers: Laurentiu Nastac, The University of Alabama; Lifeng Zhang, Missouri University of Science and Technology; Brian Thomas, University of Illinois at Urbana-Champaign; Adrian Sabau, Oak Ridge National Lab ; Nagy El-Kaddah, The University of Alabama; Adam Powell, Metal Oxygen Separation Technologies, Inc.; Hervé Combeau, Institut Jean Lamour

Wednesday AM
March 14, 2012

Room: Asia 4
Location: Dolphin Resort

Session Chairs: Laurentiu Nastac, The University of Alabama; Nagy El-Kaddah, The University of Alabama

8:30 AM

Modeling of Centrifugal Casting Processes with Complex Geometries: *Nicholas Humphreys*¹; Diane McBride²; Nick Croft²; Dimitri Shevchenko¹; Nick Green¹; Mark Cross²; ¹University of Birmingham; ²Swansea University

8:55 AM Invited

Influence of Feeding Flow and Shrinkage Pipe Formation on Macrosegregation of Investment Cast -TiAl Alloys: *Sailei Zhang*¹; Jeff Yanke¹; David Johnson¹; Matthew Krane¹; ¹Purdue Center for Metal Casting Research, School of Materials Engineering, Purdue University

9:20 AM

CFD Modeling of Macro-Shrinkage and Shrinkage Porosities in A356 Castings: *Laurentiu Nastac*¹; ¹The University of Alabama

9:40 AM

CFD Modeling of Microstructural Development in the Scanning Laser Epitaxy Process: *Ranadip Acharya*¹; Rohan Bansal¹; Justin Gambone¹; Suman Das¹; ¹Georgia Institute of Technology

10:00 AM Invited

CFD Modeling and Analysis of Casting of Energetic Materials in Cylindrical Ingots Controlled by the ACH Solidification Technology: *Laurentiu Nastac*¹; Ruslan Mudryy²; ¹The University of Alabama; ²U.S. ARMY

10:25 AM Break

10:45 AM

Defect Analysis by Casting Simulation Software in Rolling Roll Manufactured by GGG70: *Engin Tan*¹; Ali Tarakci¹; Derya Dispinar²; ¹Pamukkale University; ²University of Istanbul

WEDNESDAY AM

11:05 AM

SPH Model Approach Used to Predict Skin Inclusions into Semisolid Metal Castings: *Frédéric Pineau*¹; Guillaume D'Amours¹; ¹National Research Council Canada

11:25 AM

Influence of Mould Vibrations on the Solidification during a Horizontal Spin Casting: *Abdellah Kharicha*¹; ¹University of Leoben

11:45 AM

Inverse Modeling for Determination of Thermal Properties of the Investment Casting Ceramic Mold: *Mingzhi Xu*¹; Simon Lekakh¹; Von Richards¹; Shelly Dutler²; ¹Missouri University of Science and Technology; ²MAGMA Foundry Technologies, Inc

Characterization of Minerals, Metals, and Materials: Characterization of Environmental and Construction Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jiann-Yang Hwang, Michigan Technological University; Sergio Montero, State University of North Rio De Janeiro; Chenguang Bai, Chongqing University; John Carpenter, US Department of Energy; Donato Firrao, Politecnico di Torino; Byoung-Gon Kim, Korea Institute of Geoscience & Mineral Resources; Mingdong Cai, Schlumberger

Wednesday AM
March 14, 2012

Room: Asia 2
Location: Dolphin Resort

Session Chairs: Naiyang Ma, ArcelorMittal; Gaifeng Xue, Wuhan Iron and Steel Corp.

8:30 AM

Tile Production Using Wastes from Mining Industry of the Mining District Pachuca and Real Del Monte: Juan Hernandez¹; *Eleazar Salinas*¹; Francisco Patiño¹; Isauro Rivera¹; J. Flores¹; Norma Trápala¹; Miguel Pérez¹; Mizraim Flores¹; Iván Reyes¹; ¹Universidad Autónoma del Estado de Hidalgo

8:50 AM

Concrete Using the Composite of Steel Slag and Granulated BF Slag Powders as Cementitious Material: *Honghui Fang*¹; Jiannyang Hwang¹; Gaifeng Xue¹; Lijun Lu¹; ¹Wuhan Iron and Steel Group Company R&D Center

9:10 AM

Setting Time of Concrete Material; Laboratory Measurements Versus Field Applications: *Mourad Riad*¹; Samir Shoukry¹; Gergis William¹; ¹West Virginia University

9:30 AM

Experimental Research to Improve the Soundness of Cementitious Material Blended with Cycled Fluidized Bed Ash: *Zhu Shu Jing*¹; He Xinghua¹; ¹Department of Water Supply in South Company of China Metallurgical Group

9:50 AM

Characterization of Dust Generated in the BOF Converter: *Eduardo Junca*¹; José Oliveira²; Denise Espinosa¹; Jorge Tenório¹; ¹University of São Paulo; ²Instituto Federal do Espírito Santo

10:10 AM Break

10:20 AM

Production of Apatitic Material Using Turkish Colemanite Mineral: *Cagatay Moral*¹; Gulhayat Nasun-Saygili¹; ¹Istanbul Technical University

10:40 AM

Mercury Oxidation and Capture over SCR Catalysts in Simulated Coal Combustion Flue Gas: *Wei Gao*¹; Qingcai Liu¹; Jian Yang¹; Wenchang Xi¹; ¹University of Chongqing

11:00 AM

Gas Emission and Structural Changes in the Firing of Red Clay Ceramics with Addition of Sanitary Ware Mass Wastes: *Roberto Faria*¹; Vanessa Souza¹; Shirley Cosin²; Rosane Toledo¹; Helion Vargas¹; ¹North Fluminense State University; ²Federal University of São Carlos

Computational Thermodynamics and Kinetics: Molecular Dynamics: Potentials and Simulations

Sponsored by: The Minerals, Metals and Materials Society, 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, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Phase Transformations Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Zi-Kui Liu, The Pennsylvania State University; Mark Asta, University of California, Berkeley; James Warren, The National Institute of Standards and Technology; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yu Wang, Michigan Tech

Wednesday AM
March 14, 2012

Room: Australia 3
Location: Dolphin Resort

Session Chairs: Graeme Murch, The University of Newcastle; Byeong-Joo Lee, POSTECH

8:30 AM Invited

Recent Progress in Atomistic Computational Thermodynamics: *Byeong-Joo Lee*¹; ¹Pohang University of Science and Technology

8:55 AM

A New Many-Body Potential Based on the Second-Moment Approximation of Tight-Binding Scheme for Alpha Hafnium: *Xidong Hui*¹; Deye Lin¹; Yi Wang²; Shunli Shang²; Zi-kui Liu²; ¹University of Science and Technology Beijing; ²The Pennsylvania State University

9:10 AM

Development of Concentration Dependent Interatomic Potential and Study of Deformation Mechanisms for Light-Weight Mg-Li Alloys: *Shivraj Karewar*¹; Niraj Gupta¹; Alfredo Caro²; Srinivasan Srivilliputhur¹; Enrique Martinez²; ¹University of North Texas; ²Los Alamos National Lab

9:25 AM

Charge-Optimized Many Body (COMB) Potential for Uranium: *Yangzhong Li*¹; Tzu-Ray Shan¹; Tao Liang¹; Simon Phillpot¹; Susan Sinnott¹; ¹University of Florida

9:40 AM

Structure of Martensite Phase in Free Standing Nano-Particles: *Zhen Zhang*¹; Xiaobing Ren²; ¹Frontier Institute of Science and Technology, Xi'an Jiaotong University; ²National Institute for Materials Science, Japan

9:55 AM

Nano Phase Diagram, Structural Change and Catalytic Application of Ag-Au Bimetallic Nanoparticles: Sang Chul Yeo¹; Da Hye Kim¹; Kihyun Shin¹; *Hyuck Mo Lee*¹; ¹KAIST



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10:10 AM Break

10:30 AM

Molecular Dynamics Determination of the TTT Diagram For Crystallization of an Undercooled Liquid NiAl Alloy: Elena Levchenko¹; Irina Belova¹; Alexander Evteev¹; *Graeme Murch*¹; ¹The University of Newcastle

10:45 AM

Hybrid Deterministic and Stochastic Approach for Long Time Scale Atomistic Simulations: *Pratyush Tiwary*¹; Axel van de Walle²; ¹Caltech; ²Brown University

11:00 AM

Spatially-Dependent Cluster Dynamics Modeling of Microstructure Evolution in Low Energy Helium Irradiated Tungsten: *Thibault Faney*¹; Brian Wirth²; Niklas Juslin²; ¹UC Berkeley; ²University of Tennessee

11:15 AM

Reciprocal-Space Approach for Atomic Interactions and Configuration Correlations in Inhomogeneous Systems: *Mariya Rasshchupkyna*¹; Volodymyr Bugaev¹; Alexander Udyansky²; Miguel Castro-Colin¹; Peter Wochner¹; ¹Max Planck Institute for Intelligent Systems; ²Max Planck Institute for Iron Research GmbH

11:30 AM

Atomistic Simulation of Nucleation during Crystallization: *Ramanarayan Hariharaputran*¹; Pavlo Rutkevych¹; David Wu¹; ¹Institute of High Performance Computing, Singapore

11:45 AM

Screening High-Performance Liquid Metal Anode for SOFC: Combining Ab Initio Molecular Dynamics Simulations and Experiments: *Michael Gao*¹; Harry Abernathy¹; Mike Widom²; Yves Mantz¹; Kirk Gerdes¹; ¹National Energy Technology Lab; ²Carnegie Mellon University

Computational Thermodynamics and Kinetics: Oxides, Steels, and Nuclear Materials

Sponsored by: The Minerals, Metals and Materials Society, 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, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Phase Transformations Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Zi-Kui Liu, The Pennsylvania State University; Mark Asta, University of California, Berkeley; James Warren, The National Institute of Standards and Technology; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yu Wang, Michigan Tech

Wednesday AM
March 14, 2012

Room: Asia 5
Location: Dolphin Resort

Session Chairs: Raymundo Arroyave, Texas A & M; Bengt Hallstedt, RWTH-Aachen

8:30 AM Invited

Thermodynamic Modeling of Oxide Systems – From Slags to Advanced Functional Materials: *Bengt Hallstedt*¹; ¹RWTH Aachen University

8:55 AM

Thermodynamic and Kinetic Calculations Supporting the Development of Tool Steels: *Karin Frisk*¹; Greta Lindwall¹; ¹Swerea KIMAB

9:10 AM

Thermodynamic and Elastic Properties of β -Fe from First-Principles Calculations: *Martin Friak*¹; Fritz Koermann¹; Alexey Dick¹; Alexander Udyansky¹; Tilmann Hickel¹; David Holec²; Joerg Neugebauer¹; ¹Max Planck Institute for Iron Research; ²Montanuniversitaet Leoben

9:25 AM

Thermodynamic Properties of Cementite Including Magnetic, Vibronic, and Electronic Excitations from Ab Initio: Alexey Dick¹; Fritz Körmann¹; *Tilmann Hickel*¹; Jörg Neugebauer¹; ¹Max-Planck-Institut für Eisenforschung GmbH

9:40 AM

Ab-Initio Calculation of High-Temperature Rare Earth Phases Using Large-Displacement Phonon Methods: *Nikolas Antolin*¹; Oscar Restrepo¹; Wolfgang Windl¹; ¹Ohio State University

9:50 AM Break

10:20 AM

A Genetic Algorithm Approach to Maximize Austenite Volume Fraction in TRIP Steels: *Shengyen Li*¹; Ruixian Zhu¹; Ibrahim Karaman¹; Raymundo Arroyave¹; ¹Texas A&M University

10:35 AM

CarbonitridingTool© - Modeling the Carbonitriding Process: Yuan Xu¹; *Liang He*¹; Guannan Guo¹; Huaxia Yu¹; Laura Patricia Rivera¹; Richard D. Sisson¹; ¹Wocester Polytechnic Institute

10:50 AM

Modeling of Low Alloy Steel Gaseous Nitriding Process: *Mei Yang*¹; Richard Sisson¹; ¹WPI

11:05 AM

Advanced Stochastic Cluster Dynamics for Studying of Defect Evolution in Materials under Multi-beam Irradiation Conditions: *Tuan Hoang*¹; Jaime Marian¹; Vasily Bulatov¹; Daryl Chrzan²; ¹Lawrence Livermore National Laboratory; ²University of California, Berkeley

11:20 AM

Computational Modeling of Dislocation Loop Coarsening: *Andrew Boyne*¹; Ximiao Pan²; Yunzhi Wang²; ¹University of North Texas; ²The Ohio State University

11:35 AM

Simultaneous and Sequential Transformations: Computational Simulation, Analytical Methods and Experimental Results: *Paulo Rios*¹; Wesley Assis¹; Tatiana Salazar¹; Andre Alves¹; Simone Oliveira¹; ¹UFF-EEIMVR

11:50 AM

Identifying the Energetics of He-Point Defect Interactions in Fe: *Xunxiang Hu*¹; Donghua Xu²; Brian Wirth²; ¹UC Berkeley; ²University of Tennessee, Knoxville

Defects and Properties of Cast Metals: Ductility, Creep, Stress and Cracks

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Mark Jolly, University of Birmingham; Brian Thomas, University of Illinois at Urbana-Champaign; Carl Reilly, University of British Columbia

Wednesday AM
March 14, 2012

Room: Oceanic 4
Location: Dolphin Resort

Session Chairs: Dai Xiaojun, The University of Birmingham; Mei Li, Ford Motor Company

8:30 AM

Thermal-Mechanical Model Calibration with Breakout Shell Measurements in Continuous Steel Slab Casting: Junya Iwasaki¹; Brian Thomas²; ¹Nippon Steel Corp.; ²University of Illinois at Urbana-Champaign

8:55 AM

Transverse Creep Behavior of Superalloy Bicrystals: Kaitlin Gallup¹; Tresa Pollock¹; ¹University of California, Santa Barbara

9:20 AM

Effect of Cooling Structure on Stress Distribution of Copper Plates of Slab Continuous Casting Mold: Xiang-Ning Meng¹; ¹Northeastern University

9:45 AM

An Integrated Methodology for Optimizing Al-Si Diecastings in Automotive Applications Part2 – Model Validation in Structural Components: Nicola Gramegna¹; Franco Bonollo²; Giulio Timelli²; Stefano Ferraro²; Gianluca Quaglia¹; ¹ENGINSOFT S.p.A.; ²University Of Padova

10:10 AM Break

10:35 AM

Embrittlement in Superaustenitic Stainless Steels: Sermin Turhan¹; Barry King²; Eren Kalay³; Scott Chumbley²; ¹Cankaya University; ²Iowa State University; ³METU

11:00 AM

Deformation Prediction of a Heavy Hydro Turbine Blade During Casting Process with Consideration of Martensitic Transformation: Jinwu Kang¹; Tianjiao Wang¹; ¹Tsinghua University

11:25 AM

Reasonable Temperature Schedules for Cold or Hot Charging of Continuously Cast Slabs: Yang Li¹; Peng Lan¹; Ke Liu¹; Haibo Sun¹; Hongzhi Chen¹; Jiaquan Zhang¹; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing

11:50 AM

Affection of Charging Temperature on the Hot Ductility of Nb-Containing Steel: Yongjian Lu¹; Qian Wang¹; ¹College of Materials Science and Engineering, Chongqing University

Deformation, Damage, and Fracture of Light Metals and Alloys: Session IV

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Light Metals Division, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Qizhen Li, University of Nevada, Reno; Fuqian Yang, Univ. of Kentucky; Ke An, Oak Ridge National Laboratory

Wednesday AM
March 14, 2012

Room: Northern A2
Location: Dolphin Resort

Session Chair: Ke An, Oak ridge national lab

8:30 AM Invited

Influence of Deformation Path and Heating Rate on Recrystallization Kinetics in Al-2%Mg Alloy: Grigoreta Stoica¹; G. Muralidharan²; B. Radhakrishnan²; S. B. Gorti²; A. D. Stoica²; S. Vogel³; H. M. Reiche³; K. An²; D.E. Fielden⁴; H. Cao²; H.D. Skorpenske²; R.A. Mills²; T. Ungar⁵; B.C. Chakoumakos²; X-L. Wang²; ¹ORAU/ORNL; ²ORNL; ³LANL; ⁴UTK; ⁵Eötvös University of Budapest

9:00 AM Invited

Deformation and Fracture Behavior of Magnesium Alloy WE43 at Temperatures and Strain Rates Relevant to Deformation Processing: Sean Agnew¹; F Polesak¹; ¹University of Virginia

9:30 AM

An Investigation of Plastic-Deformation Dynamics on a Wrought AZ31B Magnesium Alloy Using Real-Time In-Situ Neutron-Diffraction Measurements: Wei Wu¹; Ke An²; Peter Liaw¹; ¹The University of Tennessee; ²Oak Ridge National Laboratory

9:50 AM Break

10:00 AM

In-Situ Neutron Diffraction Study of Plastic Deformation in Solid-Solution-Strengthened Mg-Al and Mg-Zn Binary Alloys: Soo Yeol Lee¹; Michael A. Gharghoury²; Huamiao Wang³; Ghazal Nayyeri⁴; Peidong Wu³; Warren J. Poole⁴; Wei Wu⁵; Ling Yang⁶; Ke An⁶; ¹Chungnam National University; ²National Research Council Canada; ³McMaster University; ⁴The University of British Columbia; ⁵The University of Tennessee; ⁶Oak Ridge National Laboratory

10:20 AM

In-Situ Microstructure Evolution of Pure Aluminum Single Crystal under Plane Strain Tension: Yong Seok Choi¹; Do Hyun Kim¹; Hyun-Sik Choi¹; Suk Hoon Kang²; Jun-Hyun Han³; Heung Nam Han¹; Kyu Hwan Oh¹; ¹Seoul National University; ²Korea Atomic Energy Research Institute; ³Chungnam National University

10:40 AM

Low Temperature Superplastic Deformation of Mg-Bi-Si Alloys: Sergei Remennik¹; Alexander Katsman¹; Dan Shechtman¹; ¹Technion - Israel Institute of Technology



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Electrode Technology for Aluminium Production: Characterization of Anode Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Morten Sorlie, Alcoa Norway

Wednesday AM
March 14, 2012

Room: Americas Seminar
Location: Dolphin Resort

Session Chair: Victor Buzunov, UC RUSAL

8:30 AM

Improving the Precision and Productivity of Green Coke VCM Analysis: Les Edwards¹; Kevin Hon¹; James Marino¹; Marvin Lubin¹; ¹Rain CII Carbon

8:50 AM

Discrete Element Method Applied to the Vibration Process of Coke Particles: Behzad Majidi¹; Kamran Azari¹; Houshang Alamdari¹; Mario Fafard¹; Donald Ziegler²; ¹Laval University; ²Alcoa Canada

9:10 AM

Vibrated Bulk Density using Semi-automated Device: Simplifying Sample Preparation while Improving Accuracy and Precision: Jignesh Panchal¹; Jeffrey Rolle¹; ¹A.J.Edmond Company

9:30 AM

Characterization of Pre-Baked Carbon Anode Samples Using X-Ray Computerized Tomography and Porosity Estimation: Donald Picard¹; Houshang Alamdari¹; Donald Ziegler²; Bastien Dumas¹; Mario Fafard¹; ¹Aluminium Research Centre-REGAL, Laval University; ²Alcoa Canada Primary Metals

9:50 AM

Diagnosing Anode Quality Problems Using Optical Macroscopy: Barry Sadler¹; ¹Net Carbon Consulting Pty Ltd

10:10 AM Break

10:25 AM

Properties and Production Conditions Affecting Crack Formation and Propagation in Carbon Anodes: Odd Einar Frosta¹; Arne Petter Ratvik²; Harald A. Øye²; ¹Norsk Hydro ASA; ²Norwegian University of Science and Technology

10:45 AM

New Method for Representative Measurement of Anode Electrical Resistance: Marie-Josée Chollier-Brym¹; Denis Laroche¹; Alain Alexandre¹; Michel Landry¹; Claude Simard¹; Lucien Simard¹; Danny Ringuette¹; ¹RioTinto Alcan

11:05 AM

Increasing Coke Impurities – Is this Really a Problem for Metal Quality?: Gyan Jha¹; Frank Cannova²; Barry Sadler³; ¹Tri-Arrows Aluminum; ²BP Coke; ³Net Carbon Consulting

11:25 AM

Aluminum Electrolysis Anti-Oxidation Coating Carbon Anod: Sh Yang¹; Fengli Yang¹; Zhaowen Wang²; Zhongning Shi²; Bingliang Gao²; ¹Jiangxi University of Science and Technology; ²Northeastern University

Electrometallurgy 2012: Session IV

Sponsored by: The Minerals, Metals and Materials Society, The Metallurgy and Materials Society of CIM, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee

Program Organizers: Georges Houlachi, Hydro-Quebec; Antoine Allanore, Massachusetts Institute of Technology; Michael Free, University of Utah; Michael Moats, University of Utah; Edouard Asselin, UBC; Shijie Wang, Rio Tinto Kennecott Utah Copper; James Yurko, Materion Brush Beryllium and Composites

Wednesday AM
March 14, 2012

Room: Europe 5
Location: Dolphin Resort

Session Chairs: Antoine Allanore, Mass. Inst. Techn.; Michael Free, University of Utah

8:30 AM

Electrochemical Study of the Kinetics of Copper Metal Leaching with Ferric Iron: Tomas Vargas¹; Rolando Espinoza¹; ¹University of Chile

8:50 AM

Fundamental Reduction Kinetics of Fe(III) on Chalcopyrite Surface: Guikuan Yue¹; Edouard Asselin¹; ¹The University of British Columbia

9:10 AM

Influence of Anodic and Cathodic Sub-Processes on the Rate of Copper Dissolution during Ferric Leaching of Chalcopyrite at 70 °C: Hector Jordan¹; Tomas Vargas¹; ¹University of Chile

9:30 AM

Cathodic Reactions on Oxidized Chalcopyrite Electrode: Ahmad Ghahremaninezhad¹; Edouard Asselin¹; David Dixon¹; ¹The University of British Columbia

9:50 AM

Investigation of Charge Transfer Resistance at Pyrite Electrodes Modified by Gold and Silver Nanoparticles: Maziar Eghbalnia¹; David Dixon¹; ¹University of British Columbia

10:10 AM Break

10:25 AM

Electrochemistry of Enargite: Reactivity in Alkaline Solutions: Robert Gow¹; Courtney Young¹; Hsin Huang¹; Greg Hope²; Yasushi Takasaki³; ¹Montana Tech of the University of Montana; ²Griffith University; ³Akita University

10:45 AM

Electrochemical Evaluation of Petzite Leaching: Laurence Dyer¹; Maziar Eghbalnia¹; David Dixon¹; John Rumball²; Edouard Asselin¹; ¹University of British Columbia; ²Barrick Gold Corporation

11:05 AM

Effect of pH And Temperature on Meso-2,3-Dimercaptosuccinic Acid Mediated Dissolution of Polycrystalline Au Electrodes: Scott Smith¹; Eduard Guerra¹; Jeffrey Shepherd¹; ¹Laurentian University

11:25 AM

Design and Commissioning of a Laboratory Scale Electrocoagulation Reactor: Eduard Guerra¹; Padmavathy Mahadevan²; Samir Chefai²; ¹Laurentian University; ²Barrick Gold Corporation

WEDNESDAY AM

Energy Nanomaterials: Supercapacitors

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Reza Shahbazian-Yassar, Michigan Technological University; Ming Au, Savannah River National Laboratory; Meyya Meyyappan, NASA Ames Research Center

Wednesday AM
March 14, 2012

Room: Swan 3
Location: Swan Resort

Session Chairs: Reza Shahbazian Yassar, Michigan Technological University; Ming Au, Savannah River National Laboratory

8:30 AM

Electrochemical Synthesis of Nanostructured Vanadium Oxides for Use as Supercapacitor Electrodes: Allison Engstrom¹; Fiona Doyle¹; ¹University of California, Berkeley

8:50 AM

Flexible Zn₂SnO₄/MnO₂ Core/Shell Nanocable-Carbon Microfiber Hybrid Composites for High-Performance Supercapacitor Electrodes: Lihong Bao¹; Jianfeng Zang¹; Xiaodong Li¹; ¹University of South Carolina

9:10 AM Invited

Dealloyed Nanoporous Metals for Energy Storage: Mingwei Chen¹; ¹Tohoku University

9:40 AM

Supercapacitive Properties of Hydrothermally Synthesized Co₃O₄ Nanostructures: David Mitlin¹; Huatao Wang¹; Li Zhang¹; ¹University of Alberta and NINT NRC

10:00 AM Break

10:30 AM

Graphene/Polyaniline Hybrids-Based Supercapacitor: Li Li¹; Shiren Wang¹; ¹Texas Tech University

10:50 AM

Three-Dimensional Nanoporous Bulk Composite Electrodes Utilized in Battery-Like Electrochemical Capacitors: Weifeng Wei¹; Xinwei Cui²; Weixing Chen²; Douglas Ivey²; ¹Central South University; ²University of Alberta

11:10 AM

Interdigital Hybrid Graphene/CNT Micro-Electrodes for Supercapacitor Application: Majid Beidaghi¹; Chunlei Wang¹; ¹Florida International University

11:25 AM

Nanostructured Manganese Oxide Supercapacitor Electrodes via Solution Precursor Plasma Synthesis: Raghavender Tummala¹; Ramesh Kumar Guduru¹; Pravansu S Mohanty¹; ¹Univ of Michigan

Fatigue and Corrosion Damage in Metallic Materials: Fundamentals, Modeling and Prevention: Fatigue and Corrosion Interaction and Materials Corrosion

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum; Peter Liaw, University of Tennessee

Wednesday AM
March 14, 2012

Room: Oceanic 6
Location: Dolphin Resort

Session Chairs: Jeffrey Evans, University of Alabama in Huntsville; Ronald Holtz, Naval Research Laboratory

8:30 AM

Microstructural and Environmental Effects on Corrosion and Fatigue Crack Growth in 7075 Aluminum Alloy: Amir Bonakdar¹; Jason Williams¹; Nikhilesh Chawla¹; ¹Arizona State University

8:50 AM

Model for the Superimposed Effects of Stress-Corrosion Cracking and Environmentally Enhanced Fatigue in Aluminum-Magnesium Alloy 5083: Ronald Holtz¹; Peter Pao¹; ¹Naval Research Laboratory

9:10 AM

Governing Factors for the Corrosion-to-Fatigue Transition in 7075-T651: James Burns¹; Richard Gangloff¹; ¹University of Virginia

9:30 AM

Enhanced Corrosion Fatigue Resistance of AISI304 Bellows Expansion by Modifying the Bellows Shape: Takafumi Ono¹; Hiroyuki Miyamoto¹; Toshiyuki Uenoya¹; Tomomi Fujikawa¹; ¹Doshisha University

9:50 AM

Corrosion Fatigue and Crack Propagation of Different Austenitic Stainless Steels in High Chloride Solutions at Elevated Temperatures: Clemens Vichytil¹; Gregor Mori¹; Michael Panzenböck²; Reinhard Pippan³; Rainer Fluch⁴; ¹CD-Laboratory of Localized Corrosion; ²Montanuniversität Leoben; ³Austrian Academy of Science; ⁴Bohler Special Steels

10:10 AM Break

10:20 AM

Creep-Fatigue-Environment Crack Growth Kinetics: Jeffrey Evans¹; ¹University of Alabama in Huntsville

10:40 AM

Effect of Corrosive Environment on High Cycle Fatigue of Friction Stir Welded Al-Mg Alloy: Gaurav Argade¹; Nilesh Kumar¹; Rajiv Mishra¹; ¹Missouri University of Science and Technology

11:00 AM

Galvanic Corrosion Behavior of Ni-C Filled Conductive Silicon Rubber Coupled to Magnesium Alloys: Hu Zhou¹; Zhidong Xia¹; Zhe Li¹; Fu Guo¹; ¹Beijing University of Technology

11:20 AM

Interfacial Reaction between Co-Based Alloy and Molten Al: Ning Tang¹; Yunping Li²; Shingo Kurosu²; Hiroaki Matsumoto²; Yuichiro Koizumi²; Akihiko Chiba²; ¹Graduate School of Engineering, Tohoku University, Japan; ²Institute for Materials Research, Tohoku University, Japan



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11:40 AM

The Preparation Technics of a Alloy Coating with Special Properties:
*Li Naijun*¹; ¹Science Collge of Shenyang University

From Macro to Nano, Understanding Mechanical Behavior across Length Scales: A Structural Materials Division Symposium in Honor of Robert Ritchie: Environmental Effects and Hydrogen Embrittlement

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Biomaterials Committee
Program Organizers: Jamie Kruzic, Oregon State University; Brad Boyce, Sandia National Labs; Reinhold Dauskardt, Stanford University

Wednesday AM Room: Mockingbird 1
March 14, 2012 Location: Swan Resort

Session Chairs: Brian Somerday, Sandia National Laboratories; Richard Gangloff, University of Virginia

8:30 AM Introductory Comments

8:35 AM Keynote

Models for Fracture in Lithium-Ion Battery Storage Particles: *Robert McMeeking*¹; ¹UCSB

9:15 AM Keynote

Understanding and Modeling Environment Effects on Intrinsic Fatigue Crack Propagation: *Richard Gangloff*¹; ¹University of Virginia

9:55 AM Keynote

Mechanism of Hydrogen Embrittlement in Fatigue: *Yukitaka Murakami*¹; ¹Kyushu University/ International Institute for Carbon-Neutral Energy Research

10:35 AM Break

10:50 AM

Micromechanics of Hydrogen-Induced Fracture: From Experiments and Modeling to Prognosis: *Petros Sofronis*¹; Mohsen Dadfarnia¹; Brian Somerday²; Philip Schembri³; Dorian Balch²; ¹University of Illinois; ²Sandia National Laboratories; ³Los Alamos National Laboratory

11:05 AM

Connecting Hydrogen Enhanced Plasticity to Fracture – A New Multi-Scale Approach: *May Martin*¹; Akihide Nagao¹; Mohsen Dadfarnia¹; Petros Sofronis¹; *Ian Robertson*¹; ¹University of Illinois

11:20 AM

The Effect of Trace Oxygen on Gaseous Hydrogen-Accelerated Fatigue Crack Growth in a Low-Strength Pipeline Steel: *Brian Somerday*¹; Chris San Marchi¹; Kevin Nibur²; ¹Sandia National Laboratories; ²Hy-Performance Testing

11:35 AM

Next-Generation Microelectronic Solder Joints and Their Mechanical Properties: *Hyelim Choi*¹; *Heeman Choe*¹; ¹Kookmin University

11:50 AM

Microstructure and Mechanical Properties of Electroplated Nickel-Cobalt Alloys with Cobalt Content Less Than 3wt. %: *Rong Yuan*¹; Christopher Panichas¹; Yi He¹; Mital Modi¹; ¹Intel Corporation

Integrating and Leveraging Collaborative Efforts for ICME Education: Session I

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Education Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Laura Bartolo, Kent State University; James McGuffin-Cawley, Case Western Reserve University

Wednesday AM Room: Europe 2
March 14, 2012 Location: Dolphin Resort

Session Chairs: Laura Bartolo, Kent State University; James McGuffin-Cawley, Case Western Reserve University

8:30 AM Invited

Advances in ICME Education: *Greg Olson*¹; ¹Northwestern University

9:15 AM

Computational Training in Design of Hot Strip Rolling: *Matthias Militzer*¹; ¹The University of British Columbia

9:40 AM

Centralized Computing Resources for Large or Dispersed Audiences: *David Gutschick*¹; Peter Anderson¹; ¹Ohio State University

10:05 AM

ICME in Transport Phenomena for Materials Processing: *James McGuffin-Cawley*¹; ¹Case Western Reserve University

10:30 AM Break

10:45 AM Invited

The 2011 Summer School for Integrated Computational Materials Education: *Katsuyo Thornton*¹; Larry Aagesen¹; Mark Asta²; Edwin Garcia³; John Allison¹; Laura Bartolo⁴; Jon Guyer⁵; Paul Mason⁶; Anton Van der Ven¹; Gregory Olson⁷; ¹University Of Michigan; ²UC Berkeley; ³Purdue University; ⁴Kent State University; ⁵NIST; ⁶Thermo-Calc Software Inc.; ⁷Northwestern University

11:30 AM

Interactive Two-Dimensional Simulations as an Introduction to Core ICME Concepts: *Colin Ashe*¹; David Yaron¹; Laura Bartolo²; John Portman²; W. Craig Carter³; Donald Sadoway³; ¹Carnegie Mellon University; ²Kent State University; ³Massachusetts Institute of Technology

11:55 AM

Cyber-Enabled Materials Simulations via NanoHUB.org: *Alejandro Strachan*¹; Benjamin Haley¹; Ravi Pramod Vedula¹; ¹Purdue University

WEDNESDAY AM

International Smelting Technology Symposium (Incorporating the 6th Advances in Sulfide Smelting Symposium): Fundamentals: Thermodynamics, Phase Equilibria, and Kinetics

Sponsored by: The Minerals, Metals and Materials Society, The Metallurgy and Materials Society of CIM, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
Program Organizers: Jerome Downey, Montana Tech of the Univ of Montana; Thomas Battle, Midrex Technologies, Inc.; Jesse White, Elkem Solar Research

Wednesday AM
March 14, 2012

Room: Northern A3
Location: Dolphin Resort

Session Chair: To Be Announced

8:30 AM

Departure from Equilibria in Ilmenite Smelting: *Petrus Pistorius*¹;
¹Carnegie Mellon University

8:55 AM

Distribution of Boron and Calcium between Silicon and Calcium Silicate Slags: *Lars Klemet Jakobsson*¹; Merete Tangstad¹; ¹NTNU

9:20 AM

High Temperature Experimental Investigations and Thermodynamic Modelling in the FeTiO₃-Ti₂O₃-TiO₂ Ternary Slag System: *Stian Seim*¹; Leiv Kolbeinsen²; In-Ho Jung³; ¹Eramet Titanium & Iron; ²Norwegian University of Science and Technology; ³McGill University

9:45 AM

Reaction Mechanisms in Carbothermic Production of Silicon, Study of Selected Reactions: *Eli Ringdalen*¹; Merete Tangstad²; ¹SINTEF ; ²NTNU

10:10 AM Break

10:30 AM

High Temperature Phases in Chromium Containing Cu-Fe-Ni-S Mattes: *Rauf Eric*¹; Sanele Nkosi²; ¹University of the Witwatersrand; ²Council for Mineral Technology

10:55 AM

Stabilities of Phases in the Cu₂S-FeS-PbS System: Hannu Johto¹; Pekka Taskinen¹; ¹Aalto University School of Chemical Technology

11:20 AM

Experimental Thermodynamic Study of the Equilibrium Phase Assemblage AgBi₃S₅-Bi₂S₃-S: Fiseha Tesfaye¹; Pekka Taskinen¹; ¹Aalto University School of Chemical Technology

11:45 AM

Vacuum Distillation Refining of Crude Tin - Thermodynamics Analysis and Experiments on the Removal of Arsenic from the Crude Tin: *Yifu Li*¹; Bin Yang¹; Dachun Liu¹; Baoqiang Xu¹; Yongnian Dai¹; ¹Kunming University of Science and Technology

12:10 PM

Investigation of Removing Cadmium and Thallium from Crude Indium by Vacuum Distillation: *Jiang Wenlong*¹; ¹National Engineering Laboratory of Vacuum Metallurgy, Kunming University of Science and Technology,

Magnesium Technology 2012: Alloy and Microstructural Design

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht; Neale Neelameggham, U.S. Magnesium

Wednesday AM
March 14, 2012

Room: Southern V
Location: Dolphin Resort

Session Chairs: Jian-Feng Nie, Monash University; Nack J. Kim, POSTECH

8:30 AM

Age Hardening Behavior of Mg-1.2Sn-1.7Zn Alloy Containing Al: *Taisuke Sasaki*¹; Tadakatsu Ohkubo¹; Kazuhiro Hono¹; ¹National Institute for Materials Science

8:50 AM

Evaluating the Effect of Pre-Ageing Deformation on β' Precipitate Size and Distribution in Mg-Zn(-Y) Alloys: *Julian Rosalie*¹; Hidetoshi Somekawa¹; Alok Singh¹; Toshiji Mukai²; ¹National Institute for Materials Science; ²Kobe University

9:10 AM

Effect of Zinc Content on the Microstructure and Mechanical Properties of Extruded Mg-Zn-Y-La Alloys with LPSO Phase: *Jonghyun Kim*¹; Yoshihito Kawamura²; ¹Kumamoto Technology & Industrial Foundation; ²Kumamoto University

9:30 AM

Effect of Ca Addition on the Microstructural and Mechanical Properties of AZ51/1.5 Al₂O₃ Magnesium Nanocomposite: *Md Ershadul Alam*¹; Rowshan Rima¹; Nguyen Bau²; Albedmagid Hamouda¹; Manoj Gupta²; ¹Qatar University; ²National University of Singapore

9:50 AM Break

10:10 AM

Effect of Zn Concentration and Grain Size on Prismatic Slip in Mg-Zn Binary Alloys: *Nicole Stanford*¹; Matthew Barnett¹; ¹Deakin University

10:30 AM

Microstructural Characterization of Homogenised and Aged Mg-Gd-Nd Alloys Containing Zn, Y and Zr: Suzan Khawaled¹; Menachem Bamberger¹; Alexander Katsman¹; ¹Technion - Israel Institute of Technology

10:50 AM

Mechanical Properties and High-temperature Oxidation Behavior of Mg-Al-Zn-Ca-Y Magnesium Alloys: *Young-Min Kim*¹; Bong Sun You¹; Myeong-Shik Shim²; Nack Joon Kim²; ¹Korea Institute of Materials Science; ²Pohang University of Science Technology

11:10 AM

Effects of Ca on Microstructure and Mechanical Properties of ZA62 Alloys: *Zhang Gang*¹; ¹Shenyang University of Technology

11:30 AM

Effects of Si on Microstructure and Mechanical Properties of Mg-5Sn-2Sr Alloy: *Hao Shuai*¹; ¹Shenyang University of Technology.



TMS 2012

141st Annual Meeting & Exhibition

Magnesium Technology 2012: Casting and Solidification

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht; Neale Neelameggham, U.S. Magnesium

Wednesday AM
 March 14, 2012

Room: Southern IV
 Location: Dolphin Resort

Session Chairs: Norbert Hort, Helmholtz-Zentrum Geesthacht; Yongho Sohn, University of Central Florida

8:30 AM

Twin Roll Casting of Thin AZ31 Magnesium Alloy Strip with Uniform Microstructure and Chemistry: Iman Bayandorian¹; Ian Stone¹; Yan Huang¹; Zhongyun Fan¹; ¹Brunel University

8:50 AM

Mathematical Modeling of the Twin Roll Casting Process for AZ31 Magnesium Alloy – Effect of Set-Back Distance: Amir Hadadzadeh¹; Mary Wells¹; Elhachmi Essadiqi²; ¹University of Waterloo; ²CANMET Materials Technology Laboratory

9:10 AM

Interdiffusion and Phase Formation in the Mg-Y System: Katrina Bermudez¹; Sarah Brennan¹; Yongho Sohn¹; ¹University of Central Florida

9:30 AM

Microstructure and Mechanical Properties of High Pressure Die Cast AM50 Magnesium Alloy Containing Ce: Faruk Mert¹; Ahmet Özdemir¹; Karl Ulrich Kainer²; Norbert Hort²; ¹Gazi University; ²Helmholtz-Zentrum Geesthacht (HZG)

9:50 AM

Effect of Intensive Melt Shearing on DC Cast Ingots of Magnesium Alloys: Yubo Zuo¹; Zhongyun Fan¹; Bo Jiang¹; Yijie Zhang¹; ¹Brunel University

10:10 AM Break

10:30 AM

Effect of the Solidification Rate on Microstructure of Cast Mg Alloys at Low Superheat: Gregory Poole¹; Nathan Rimkus²; Aerial Murphy¹; Paige Boehmcke¹; Nagy El-Kaddah¹; ¹The University of Alabama; ²Los Alamos National Laboratory

10:50 AM

Impact and Energy Dissipation Characteristics of Squeeze and Die Cast Magnesium Alloy AM60: Sante DiCecco¹; Henry Hu¹; William Altenhof¹; ¹University of Windsor

11:10 AM

Sliding Wear Behavior of Squeeze Cast Magnesium Composite AM60-9% (Al₂O₃)f: Anindya Banerji¹; Henry Hu¹; Ahmet Alpas¹; ¹University Of Windsor

11:30 AM

Solidification Studies of Mg-Al Binary Alloys: Manas Paliwal¹; Youn-Bae Kang²; Elhachmi Essadiqi³; In-Ho Jung¹; ¹McGill University; ²GIFT, POSTECH; ³CANMET-MTL

Magnetic Materials for Energy Applications II: Magnetocaloric and Magnetostrictive Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Raju Ramanujan, Nanyang Technological University; Francis Johnson, GE Global Research; S Guruswamy, Univ. of Utah; J Liu, Electron Energy Corporation

Wednesday AM
 March 14, 2012

Room: Europe 10
 Location: Dolphin Resort

Session Chairs: R. Mahendiran, National University of Singapore; Ivan Skorvanek, Slovak Academy of Sciences

8:30 AM Invited

Magnetocaloric Effect in Pr-Doped La_{0.7}Ca_{0.3}MnO₃: Magnetic and Calorimetric Studies: Ramanathan Mahendiran¹; ¹National University of Singapore

9:00 AM Invited

Magnetocaloric Effect in GdFeCo-Based Melt-Spun Ribbons: Jozef Marcin¹; Zbigniew Sniadecki²; Jozef Kovac¹; Bogdan Idzikowski²; Ivan Skorvanek¹; ¹Institute of Experimental Physics; ²Institute of Molecular Physics

9:30 AM Invited

Novel La(Fe,Si)₁₃-Based Composites for Magnetic Refrigeration: Julia Lyubina¹; Ullrich Hannemann²; Mary Ryan²; Lesley Cohen²; ¹Imperial College London; ²Imperial College London

10:00 AM

Optimizing the Magnetic Field Response of Magnetocaloric Materials by Nanostructuring: Victorino Franco¹; Rafael Caballero-Flores¹; Alejandro Conde¹; Laszlo Kiss²; Laszlo Péter²; Imre Bakonyi²; ¹Sevilla University; ²Hungarian Academy of Sciences

10:15 AM Break

10:30 AM

Comprehensive Study on Microstructure and the Magnetocaloric Properties in Mn-Substituted La(Fe,Si)₁₃: Maria Krautz¹; Cristiano Teixeira¹; Konstantin Skokov¹; Jian Liu¹; James Moore¹; Paulo Wendhausen²; Ludwig Schultz¹; Oliver Gutfleisch¹; ¹IFW Dresden; ²Federal University of Santa Catarina

10:45 AM

The Maximum Possible Cooling Power of La(FeSi)₁₃ and Gd Based Magnetic Refrigerators: Konstantin Skokov¹; Alexey Karpenkov¹; Oliver Gutfleisch¹; ¹Leibniz Institute for Solid State and Materials Research

11:00 AM

Effect of W Substitution on the Magnetostrictive Behavior of [001] Fe-Ga Alloy Single Crystal: Chai Ren¹; Biswadeep Saha¹; Meenakshisundaram Ramanathan¹; Sivaraman Guruswamy¹; ¹University of Utah

11:15 AM

Influence of Deformation and Ga Content on Magnetostriction in Fe-Ga Alloys: Biswadeep Saha¹; Meenakshisundaram Ramanathan¹; Chai Ren¹; Sivaraman Guruswamy¹; ¹University of Utah

11:30 AM

Modeling Magnetic and Structural Phase Transformations in Co-Ni-Al Ferromagnetic Shape Memory Alloys FSMA's: Hassan Thawabi¹; Navdeep Singh¹; ¹Texas A&M University

WEDNESDAY AM

Materials and Fuels for the Current and Advanced Nuclear Reactors: Structural Materials II

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS/ASM: Nuclear Materials Committee

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Wednesday AM
March 14, 2012

Room: Swan 2
Location: Swan Resort

Session Chair: Kumar Sridharan, University of Wisconsin - Madison

8:30 AM Invited

Materials Development for the Traveling Wave Reactor: *Micah Hackett*¹; Gary Povirk¹; James Vollmer¹; ¹TerraPower

9:00 AM

Materials Corrosion in Liquid Fluoride Salt for NNGP Applications: *Kumar Sridharan*¹; Luke Olson¹; Robert Sellers¹; Brian Kelleher¹; Wei-Jen Cheng²; James Ambrosek¹; Mark Anderson¹; Todd Allen¹; ¹University of Wisconsin; ²National Taiwan University of Science and Technology

9:20 AM

Corrosion Behavior of a F91/Fe-12Cr-2Si Composite in Liquid Lead-Bismuth-Eutectic as a Function of Oxygen Potential in the Temperature Range 600-715°C: *Michael Short*¹; Ronald Ballinger¹; ¹MIT

9:40 AM

Effects of Ordering Reaction on Lattice Variation in Alloy 690: *SungSoo Kim*¹; Young Suk Kim¹; ¹Korea Atomic Energy Research Institute

10:00 AM Break

10:10 AM

Effect of Coatings on the Corrosion-resistance of Fe, 9-14% Cr Steels in Supercritical Water: *Selçuk Kuyucak*¹; Jian Li¹; Wenyue Zheng¹; ¹Dept. of Natural Resources Canada

10:30 AM

Studies on Stacking Fault Energy of Low Carbon Austenitic Stainless Steels: *Toshio Yonezawa*¹; Ken Suzuki¹; Suguru Ooki²; Hideshi Tezuka²; Shunichi Suzuki²; ¹Tohoku University; ²Tokyo Electric Power Company

10:50 AM

Formation and Thermal Stability of Nanosized Oxide Precipitates in NiAl-(Y2O3,Ti) Alloys: *Yongdeog Kim*¹; Hyon-Jee Lee¹; Zuhair A. Munir²; Lizhen Tan³; Jeremy T. Busby³; Brian D. Wirth⁴; ¹UC BERKELEY; ²UC Davis; ³Oak Ridge National Laboratory; ⁴University of Tennessee, Knoxville

11:10 AM

Finite Element Creep Behavior Analysis in Welded Joints of Modified 9Cr-1Mo Steel: *Mehdi Basirat*¹; Triratna Shrestha¹; Gabriel Potirniche¹; Indrajit Charit¹; Karl Rink¹; ¹University of Idaho

11:30 AM

Study on Microstructural Changes and Corrosion Resistance of Ti-5Ta-2Nb/304L SS Explosive Clads in Concentrated Nitric Acid: *Sudha Cheruvathur*¹; Ravishankar A¹; Prasanthi T.N¹; Kamachi Mudali U¹; Saroja S¹; ¹Indira Gandhi Centre for Atomic Research

Materials Design Approaches and Experiences III: Superalloys

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Ji-Cheng Zhao, The Ohio State University; Akane Suzuki, GE Global Research; Deb Whitis, GE Aviation; Michael Fahrman, Haynes International Inc.; Qiang Feng, University of Science and Technology Beijing

Wednesday AM
March 14, 2012

Room: Europe 11
Location: Dolphin Resort

Session Chairs: Akane Suzuki, GE Global Research; Deb Whitis, GE Aviation

8:30 AM Invited

The Alloys by Design Approach in Superalloy Development: *Nils Warnken*¹; ¹University of Birmingham

9:00 AM Invited

Development of Superalloy GTD262 at GE: Liang Jiang¹; *Ganjiang Feng*²; Ji-Cheng Zhao¹; ¹GE Global Research; ²GE Energy

9:30 AM Invited

New Co-Base Superalloys Strengthened by γ' Phase - Alloy Design and Applications: *Kiyohito Ishida*¹; ¹Tohoku University

10:00 AM Break

10:20 AM

High Temperature Microstructure and Properties of New L1₂-Containing Co-Al-W Alloys: *Michael Titus*¹; Jun Zhu²; Alessandro Mottura¹; Akane Suzuki³; Tresa Pollock¹; ¹University of California, Santa Barbara; ²University of Michigan; ³GE Global Research

10:40 AM

Effect of Alloying Elements on Microstructure and Mechanical Property of Co-Al-W-Base Superalloys: Fei Xue¹; Meiling Wang¹; *Qiang Feng*¹; ¹University of Science and Technology Beijing

11:00 AM Invited

Accelerating Insertion of Materials at GE Aviation: *Deborah Whitis*¹; Arturo Acosta¹; Daniel Wei¹; Liang Jiang¹; ¹General Electric Company

11:30 AM Invited

Development of High Temperature Capability P/M Disk Superalloys: Eric Huron¹; Kenneth Bain¹; David Mourer¹; ¹General Electric Company

12:00 PM

Computational Development of Polycrystalline Alloys Using Automated Importance Sampling: *Bryce Conduit*¹; Gareth Conduit¹; Paul Mignaneli¹; Howard Stone¹; Mark Hardy²; ¹University of Cambridge; ²Rolls-Royce plc



TMS 2012

141st Annual Meeting & Exhibition

Materials in Clean Power Systems VII: Clean Coal-, Hydrogen Based-Technologies, and Fuel Cells: Materials for Clean Coal Technologies, Turbines

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS: Energy Conversion and Storage Committee

Program Organizers: Xingbo Liu, West Virginia University; Teruhisa Horita, National Institute of Advanced Industrial Science and Technology; Jeffrey Hawk, National Energy Technology Lab; Jeffrey Fergus, Auburn University

Wednesday AM
March 14, 2012

Room: Europe 8
Location: Dolphin Resort

Session Chairs: Junpin Lin, University of Science and Technology Beijing; Axel Kranzmann, Federal Institute of Materials

8:30 AM Invited

Corrosion and Materials Degradation in Microturbines: *Wendy Matthews*¹; Karren More²; ¹Independent Consultant; ²Oak Ridge National Laboratory

9:00 AM

Development of Cast Alumina-Forming Austenitic Stainless Steel Alloys: *Govindarajan Muralidharan*¹; Yukinori Yamamoto¹; Michael Brady¹; Larry Walker¹; ¹Oak Ridge National Laboratory

9:20 AM

Impact of Casting Superheat on the Mechanical Properties of Traditionally Wrought Ni-Based Superalloys for USC Steam Turbines: *Paul Jablonski*¹; Jeffery Hawk¹; Daniel Purdy²; Philip Maziasz²; ¹US Department of Energy; ²GE; ³ORNL

9:40 AM

Mechanical Behavior of Tempered Martensitic Steels for Ultrasupercritical Steam Applications: *Jeffrey Hawk*¹; Paul Jablonski¹; Christopher Cowen²; ¹U.S. Department of Energy, National Energy Technology Laboratory; ²United States Department of the Treasury

10:00 AM Break

10:10 AM

Influence of SO₂ and Water on the Corrosion in Oxyfuel Coal Power Plant: *Axel Kranzmann*¹; Alexander Findeisen²; ¹Federal Institute for Materials Research and Testing; ²BTU Cottbus

10:30 AM

Microstructure Characterization of Crept Ni-Base Alloys for High Temperature Use: *Jeffrey Hawk*¹; John Sears²; Paul Jablonski¹; ¹U.S. Department of Energy, National Energy Technology Laboratory; ²URS, NETL

10:50 AM

Strengthening Concepts & Mechanical Behavior of Ni-Base Alloys in A-USC Steam Turbines: *Jeffrey Hawk*¹; Paul Jablonski¹; ¹U.S. Department of Energy, National Energy Technology Laboratory

11:10 AM

The Effect of Temperature on Equilibrium of Coal-Petcoke Slag Mixtures under Gasification Conditions: *Jinichiro Nakano*¹; Sudhir Ranjan²; Kye-Sing Kwong¹; James Bennett¹; Xueyan Song³; Seetharaman Sridhar²; ¹NETL; ²Carnegie Mellon University; ³West Virginia University

11:30 AM

Nano-Scale Carbide Characterization in a Tempered Martensitic 9Cr Steel Used for Ultrasupercritical Steam Power Plants: *Niven Monseque*¹; Mitsuhiro Murayama¹; William Reynolds¹; ¹Virginia Tech

Materials Research in Microgravity: Session V

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Robert Hyers, University of Massachusetts; Hani Henein, University of Alberta; Valdis Bojarevics, University of Greenwich; James Downey, NASA; Douglas Matson, Tufts University; Achim Seidel, Astrium; Daniela Voss, ESA

Wednesday AM
March 14, 2012

Room: Asia 3
Location: Dolphin Resort

Session Chair: To Be Announced

8:30 AM Invited

Solidification Modeling: from Electromagnetic Levitation to Atomization Processing: *Charles-Andre Gandin*¹; D. Tourret²; T. Volkman²; D. Herlach²; A. Ilbagi³; H. Henein³; ¹MINES ParisTech; ²DLR; ³University of Alberta

9:05 AM Invited

X-Ray Radiographic Observation of Directional Solidification under Microgravity: XRMON-GF Experiments on MASER12 Sounding Rocket Mission: *Guillaume Reinhart*¹; Henri Nguyen-Thi¹; Aboul-Aziz Bogno¹; Bernard Billia¹; Ragnvald Mathiesen²; Gerhard Zimmermann³; Ylva Houltz⁴; Kenneth Löth⁴; Daniela Voss⁵; Antonio Verga⁵; Fabio De Pascale⁵; ¹IM2NP - Université Paul Cézanne; ²NTNU; ³ACCESS e.V.; ⁴Swedish Space Corporation; ⁵European Space Agency

9:40 AM

Innovative Video Diagnostic Equipment for Material Science Experiments in Space: *Giuseppe Capuano*¹; Daniele Titomanlio¹; Wolfgang Soellner²; Achim Seidel²; ¹Techno System Developments; ²Astrium

10:05 AM Break

10:25 AM Invited

Three-Dimensional Interface Pattern Evolution in Directional Solidification under Microgravity Conditions: Nathalie Bergeon¹; Anthony Ramirez¹; L.Chen¹; Bernard Billia¹; Alain Karma²; Jiho Gu³; Min Xu³; *Rohit Trivedi*³; ¹Université Paul Cézanne; ²Northeastern University; ³Iowa State University

11:00 AM

Containerless Measurements of Density and Viscosity of Fe-Co Alloys: *Jonghyun Lee*¹; Douglas Matson²; Robert Hyers³; ¹Tufts University and UMass Amherst; ²Tufts University; ³University of Massachusetts

11:25 AM

TEMHD Effects On Solidification under Microgravity Conditions: Andrew Kao¹; *Koulis Pericleous*¹; ¹University of Greenwich

Mechanical Behavior at Nanoscale I: Deformation/strength at Nanoscale and Li- induced Deformation

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Scott Mao, University of Pittsburgh; Julia R Greer, California Institute of Technology; Jianyu Huang, Center for Integrated Nanotechnologies; Marc Legros, CEMES-CNRS; Ting Zhu, Georgia Institute of Technology

Wednesday AM
March 14, 2012

Room: Asia 1
Location: Dolphin Resort

Session Chairs: David Bahr, Washington State University; Nathan Mara, Los Alamos National Laboratories

8:30 AM Invited

Unveiling the Strengthening and Toughening Mechanisms of Nacre – Lessons from Nature: Xiaodong Li¹; ¹University of South Carolina

9:00 AM

Size Effect on the Mechanical Behaviour of GaAs Nanowires: Yanbo Wang¹; Qiang Gao²; Xiaozhou Liao¹; Yiu-Wing Mai¹; Chennupati Jagadish²; ¹The University of Sydney; ²The Australian National University

9:20 AM

Plasticity of Metal Nanoparticles in Nanoextrusion: Antti Tolvanen¹; Karsten Albe¹; ¹TU-Darmstadt

9:40 AM

Anisotropic Swelling of Si Nanowires and Size-Dependent Fracture of Si Nanoparticles during Lithiation: Xiaohua Liu¹; He Zheng²; Li Zhong²; Shan Huang³; Khim Karki⁴; Li Qiang Zhang²; Yang Liu¹; Akihiro Kushima⁵; Wen Tao Liang⁶; Jiang Wei Wang²; Jeong-Hyun Cho⁷; Eric Epstein⁴; Shadi Dayeh⁷; Tom Picraux⁷; Ting Zhu³; Ju Li⁵; John Sullivan¹; John Cumings⁴; Chunsheng Wang⁴; Scott Mao²; Zhi Zhen Ye⁸; Sulin Zhang⁶; Jian Yu Huang¹; ¹Sandia National Laboratories; ²University of Pittsburgh; ³Georgia Institute of Technology; ⁴University of Maryland; ⁵University of Pennsylvania; ⁶Pennsylvania State University; ⁷Los Alamos National Laboratory; ⁸Zhejiang University

10:00 AM Break

10:10 AM Invited

Physical Origin of Large Strain Bursts in Submicron Al Pillars: Zhangjie Wang¹; Yuan Gao²; Qingjie Li¹; Zhiwei Shan¹; Ju Li³; Zhuo Zhuang²; Jun Sun¹; Evan Ma⁴; ¹Center for Advancing Materials Performance from the Nanoscale (CAMP-Nano) & Hysitron Applied Research Center in China (HARCC), State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University; ²Applied Mechanics Laboratory, School of Aerospace, Tsinghua University, Beijing; ³Department of Nuclear Science and Engineering and Department of Materials Science and Engineering, Massachusetts Institute of Technology; ⁴Department of Materials Science and Engineering, Johns Hopkins University

10:30 AM

In-Situ Transmission Electron Microscopy Observation of Discrete Hopping Lithiation in ZnO Nanowire: Akihiro Kushima¹; Xiao Liu²; Guang Zhu³; Ju Li⁴; Zhong Wang³; Jian Huang²; ¹Department of Materials Science and Engineering, University of Pennsylvania; ²Center for Integrated Nanotechnologies, Sandia National Laboratories; ³School of Materials Science and Engineering, Georgia Institute of Technology; ⁴Department of Nuclear Science and Engineering and Department of Materials Science and Engineering, Massachusetts Institute of Technology

10:50 AM

Multiple-Stripe Lithiation Mechanism of Individual SnO₂ Nanowires in a Flooding Geometry: Jianyu Huang¹; Scott Mao²; Li Zhong²; Xiaohua Liu¹; Guofeng Wang²; ¹Center for Integrated Nanotechnologies, Sandia National Laboratories; ²Department of Mechanical Engineering and Materials Science, Univ. of Pittsburgh

11:10 AM

Thickness Dependent Deformation Behaviour of Multilayer Metallic Nanopillars: Mark Hoffman¹; Pranesh Dayal¹; Nick Savvides¹; ¹The University of New South Wales

11:30 AM

In Situ TEM Electrical Contact Indentation Observations in Doped Si Nanopillars: Douglas Stauffer¹; Sanjit Bhowmick¹; Sergei Krylyuk²; Albert Davydov²; Ryan Major¹; ¹Hysitron, Inc.; ²Metallurgy Division, Material Measurement Laboratory (MML)

11:50 AM

Multiscale Modeling of Anisotropic Growth in Lithiated Silicon Nanowires: Sulin Zhang¹; Hui Yang¹; Xu Huang¹; Shan Huang²; Ting Zhu²; ¹The Pennsylvania State University; ²Georgia Tech

12:10 PM

Study of Dislocation Climb at Nanovoids in BCC Metal: Mishreyee Bhattacharya¹; A. Dutta²; A. Giri¹; N. Gayathri¹; P. Barat¹; ¹Variable Energy Cyclotron Centre; ²Jadavpur University

Mechanical Behavior Related to Interface Physics: Interface Structures: Characterization, Theory, and Modeling

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Izabela Szlufarska, University of Wisconsin-Madison; Zhiwei Shan, Xi'an Jiaotong University

Wednesday AM
March 14, 2012

Room: Oceanic 1
Location: Dolphin Resort

Session Chairs: Nathan Mara, Los Alamos National Laboratory; Sreeramamurthy Ankem, University of Maryland

8:30 AM Keynote

Disconnection Mechanisms in Twin Growth: Robert Pond¹; ¹University of Exeter

9:00 AM Keynote

Exploiting the Atomic Structure of Interfaces in Crystalline Solids: Richard Hoagland¹; Jian Wang¹; Michael Demkowicz²; Amit Misra¹; ¹Los Alamos National Laboratory; ²MIT



TMS 2012

141st Annual Meeting & Exhibition

9:30 AM

Atomic Cu/Nb Interface Structures Characterized by Transmission Electron Microscopy: *Shijian Zheng*¹; Weizhong Han¹; Robert Dickerson¹; Nathan Mara¹; ¹Los Alamos National Laboratory

9:45 AM

Evaluation of Twin Boundary Interfaces to Strain Hardening by Electron Channeling Contrast Imaging: *Ivan Gutierrez-Urrutia*¹; Dierk Raabe¹; ¹Max-Planck-Institut for Iron Research

10:00 AM

Ultra Fast Grain Boundary Segregation In Hot Deformed Nickel: *Marion Allart*¹; Frédéric Christien¹; René Le Gall¹; ¹Université de Nantes

10:15 AM Break

10:25 AM Keynote

The Role of Interfacial Interaction Stresses and Crystallography on Deformation Mechanisms of Two-Phase Titanium Alloys: William Joost¹; Zane Wyatt¹; *Sreeramamurthy Ankem*¹; ¹University of Maryland

10:55 AM

Quantitative NanoSIMS Analysis of Grain Boundary Segregation in Bulk Samples: *Frederic Christien*¹; Katie Moore²; Clive Downing²; Chris Grovenor²; ¹University of Nantes; ²University of Oxford

11:10 AM

Increased Adhesion of Cr-PI Interface at High Temperatures: *Megan Cordill*¹; Aidan Taylor¹; Gerhard Dehm²; ¹Erich Schmid Institute of Materials Science; ²Dept. Material Physics

11:25 AM

Atomistically Informed Dislocation Dynamics Simulations on Dislocation-Interface Interactions: *Caizhi Zhou*¹; Jian Wang²; Irene Beyerlein²; Curt Bronkhorst²; ¹ Los Alamos National Laboratory; ²Los Alamos National Laboratory

11:40 AM

The Periodic Unit of Doubly-diffracted Reflections from Periodic Grain Boundaries in Cubic Crystals and Its Relationship with Coincident Site Lattice: *Mohammad Shamsuzzoha*¹; ¹University of Alabama

Mechanical Performance of Materials for Current and Advanced Nuclear Reactors: Irradiation and Testing of Fuels and Cladding Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Nicholas Barbosa, National Institute of Standards & Tech; Greg Oberson, United States Nuclear Regulatory Commission; Matthew Kerr, United States Nuclear Regulatory Commission; Elaine West, Knolls Atomic Power Laboratory; Stuart Maloy, Los Alamos National Laboratory; Osman Anderoglu, LANL

Wednesday AM
March 14, 2012

Room: Swan 1
Location: Swan Resort

Session Chairs: Stuart Maloy, Los Alamos National Laboratory; Osman Anderoglu, Los Alamos National Laboratory

8:30 AM Invited

In-Situ and Post Irradiation Mechanical Testing of Ion Irradiated Materials: *Gary Was*¹; Anne Campbell¹; Vani Shankar²; Cheng Xu¹; ¹University of Michigan; ²IGCAR

9:00 AM

Ion Implantation as a Neutron Analogue in Tungsten Alloys: Measuring Mechanical Properties: *David Armstrong*¹; Steve Roberts¹; Angus Wilkinson¹; ¹University of Oxford

9:20 AM

In-Situ Proton Irradiation Creep of Ferritic-Martensitic Steel T91: *Cheng Xu*¹; Gary Was¹; ¹University of Michigan

9:40 AM

In-Situ Ion Irradiation TEM and Nanoindentation Studies of 316L and HT9: *Khalid Hattar*¹; Alexander McGinnis²; Thomas Buchheit¹; Luke²; ¹Sandia National Laboratories; ²Naval Postgraduate School

10:00 AM

On the Radiation Growth in HCP Metals: *Stanislav Golubov*¹; Alexander Barashev¹; Roger Stoller¹; ¹ORNL

10:20 AM Break

10:40 AM

Grain Size Effect on Radiation Induced Defect Morphology in Nanocrystalline Iron: *Greg Vetterick*¹; Chris Barr¹; John Baldwin²; Khalid Hattar³; Mark Kirk⁴; Pete Baldo⁴; Amit Misra²; Mitra Taheri¹; ¹Drexel University; ²Los Alamos National Laboratory; ³Sandia National Laboratories; ⁴Argonne National Laboratory

11:00 AM

Development of W-UO₂/CeO₂ CERMET Fuels for Ultra High Temperature Reactor Applications: *Jonathan Webb*¹; James Werner¹; Robert Hickman²; ¹Idaho National Laboratory; ²NASA Marshall Space Flight Center

11:20 AM

Structure and Property Relationship in Spark Plasma Sintered UO₂ Pellets: *Ghatu Subhash*¹; James Tulenko¹; Ronald Baney¹; Ge Lihao¹; Andrew Cartas¹; ¹University of Florida

11:40 AM

Non-Destructive Analysis of Microstructural Evolution after Irradiation of Zr_{2.5}Nb Pressure Tubes Using Neutron Diffraction Line Profile Analysis: *Levente Balogh*¹; Donald Brown¹; Mark Daymond²; ¹Los Alamos National Laboratory; ²Queen's University

Nanocomposites: Nanocomposites for Magnetic and Dielectric Applications

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Composite Materials Committee

Program Organizers: Garth Wilks, Air Force Research Laboratory; Jonathan Spowart, Air Force Research Laboratory; Meisha Shofner, Georgia Institute of Technology; John Zhanhu Guo, Lamar University

Wednesday AM
March 14, 2012

Room: Swan 8
Location: Swan Resort

Session Chairs: John Zhanhu Guo, Lamar University; Matthew Lucas, Air Force Research Laboratory

8:30 AM

Removal of As(III) from Water and Decolorization of Methylene Blue by Mn₃O₄-Coated Magnetite Nanoparticles: *Gabriela Silva*¹; Fabiana S. Almeida²; Nathália C. Pissolati²; Maria Sylvania S. Dantas¹; Ângela M. Ferreira²; Virginia S.T. Ciminelli¹; ¹UFMG; ²CEFET-MG

8:50 AM

Synthesis and Electrical Analysis of Nano-Crystalline Barium Titanate and PLZT Nanocomposites for Use in High-Energy Density Applications: *Christopher DiAntonio*¹; Todd Monson¹; Tom Chavez¹; ¹Sandia National Laboratories

9:10 AM

Conductive Polyaniline-Magnetite Nanocomposites: *Hongbo Gu*¹; Yudong Huang¹; Xi Zhang¹; Jiahua Zhu¹; Suying Wei¹; John Zhanhu Guo¹; ¹Lamar University

9:30 AM

Synthesis of Tailored Core-Shell Magnetic Microparticles for Intravascular Embolization: *Gabriella Ferreira*¹; Alexandre Umpierre¹; *Fabricio Machado*¹; ¹Universidade de Brasília

9:50 AM Break

10:10 AM Invited

Electromagnetic Field Shielding Polyurethane Nanocomposites Reinforced with Core-Shell Fe-Silica Nanoparticles: *Jiahua Zhu*¹; Suying Wei¹; *John Zhanhu Guo*¹; ¹Lamar University

10:50 AM

Hysteretic Magneto-Photoluminescence in Mn Ion Implanted Silicon Rich Oxide Thin Films: *Wei Pan*¹; ¹Sandia National Labs

11:10 AM

Structure-Property Relationships Nanostructured Dielectric Materials: *Lawrence Drummy*¹; Scott Fillery¹; Hilmar Koerner¹; Richard Vaia¹; ¹Air Force Research Laboratory

11:30 AM

Effects of Thermal Processing on Crystallinity and Dielectric Properties of P(VDF-HFP) Nanocomposites: *Hongxu Liu*¹; *Fiona Doyle*¹; ¹University of California, Berkeley

11:50 AM

Soft Magnetic Nanocomposite for High Frequency Applications: *Matthew Lucas*¹; ¹Air Force Research Laboratory

12:10 PM

Dramatic Expansion of Luminescence Region in GaP/Polymer Nanocomposites: *Sergei Pyshkin*¹; John Ballato²; ¹Academy of Sciences of Moldova; ²Clemson University

Neutron and X-Ray Studies of Advanced Materials V: Centennial: Alloys, Correlations, Phase Transitions

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Xun-Li Wang, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Lyle Levine, National Institute of Standards and Technology; Peter Liaw, Univ of Tennessee; Yandong Wang, Beijing Institute of Technology; Brent Fultz, California Institute of Technology

Wednesday AM
March 14, 2012

Room: Southern I
Location: Dolphin Resort

Funding support provided by: Office of Basic Energy Sciences, U.S. Dept. of Energy, Dr. P. Thyagarajan

Session Chairs: Brent Fultz, California Institute of Technology; Miguel Castro-Colin, Max Planck Institut Fuer Intelligente Systeme

8:30 AM Keynote

Structural Characterization of Complex Materials Using Total Scattering: *Thomas Proffen*¹; ¹Oak Ridge National Laboratory

8:55 AM

Inelastic Scattering Studies of Iron Alloys: *Matthew Lucas*¹; ¹Air Force Research Laboratory

9:10 AM Invited

Local Structure and Diffuse Scattering in Modern Ferroelectric Materials: *Marek Pasciak*¹; Ross Whitfield¹; Darren Goossens¹; Richard Welberry¹; ¹Australian National University

9:30 AM

The PDF of Glassy Solids - Pitfalls and Traps of Experiment and Interpretation: *Wojciech Dmowski*¹; Takeshi Egami²; ¹University of Tennessee; ²ORNL

9:45 AM Invited

X-Ray Cross-Correlation Analysis and Sample Ensemble Averaging Effect: *Miguel Castro-Colin*¹; Peter Wochner¹; Mariya Rasschchupkyna¹; Volodymyr Bugaev¹; Christian Gutt²; Gerhard Gruebel²; ¹Max-Planck-Institut fuer IS; ²DESY

10:05 AM Invited

Characterization of Complex Precipitation Pathways Using Small Angle X-Ray Scattering: *Alexis Deschamps*¹; Frédéric de Geuser²; ¹Grenoble Institute of Technology; ²CNRS

10:25 AM

Characterization of Nanostructures in Co-Pd-Si-O Soft Magnetic Nanogranular Film Using Compact type Small-Angle Neutron Scattering Spectrometer: *Yojiro Oba*¹; Masato Ohnuma¹; Shigehiro Ohnuma²; Michihiro Furusaka³; ¹National Institute for Materials Science; ²Research Institute for Electromagnetic Materials; ³Hokkaido University

10:40 AM Break

10:50 AM

Synchrotron SAXS of Reverted Al-4wt.%Cu during In Situ Artificial Ageing: *Brad Diak*¹; Marsha Singh¹; Shig Saimoto¹; Luke Westfall¹; Lixia Rong²; ¹Queen's University; ²Stony Brook University



TMS 2012

141st Annual Meeting & Exhibition

11:05 AM Invited

Local Structure Models of Diffuse Scattering in Relaxor Ferroelectrics: *Branton Campbell*¹; Benjamin Frandsen¹; Va-Yee Vue¹; Matthew Gardner¹; Kevin Seppi¹; ¹Brigham Young University

11:25 AM

The Structural Relationship between Negative Thermal Expansion and Quartic Anharmonicity of Cubic ScF₃: *Chen Li*¹; Xiaoli Tang¹; Jorge Munoz¹; Douglas Abernathy²; Brent Fultz¹; ¹Caltech; ²ORNL

11:40 AM

In-Situ Measurement of Crystalline Lattice and Amorphous Strains in Fluoropolymers by Neutron Diffraction: *Eric Brown*¹; Bruce Orler¹; Cynthia Welch¹; Dana Dattelbaum¹; Rex Hjelm¹; Arthur Scholz²; Don Brown¹; ¹Los Alamos National Laboratory; ²UC Santa Barbara

11:55 AM

Lattice Defects Diffuse Scattering from Thin Films of Si-Ge System with Low Energy Ar⁺ and Xe⁺ Bombardments during MBE Growth: *Paul Rozenak*¹; ¹Hydrogen Energy Batteries LTD

12:10 PM

Vibrational Entropy of Amorphous Copper Zirconium: *Hillary Smith*¹; Chen Li¹; Glenn Garrett¹; Matthew Lucas²; Matthew Stone³; Douglas Abernathy³; Brent Fultz¹; ¹California Institute of Technology; ²Air Force Research Lab; ³Oak Ridge National Lab

Neutron and X-Ray Studies of Advanced Materials V: Centennial: Local Structure from Diffraction

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Xun-Li Wang, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Lyle Levine, National Institute of Standards and Technology; Peter Liaw, Univ of Tennessee; Yandong Wang, Beijing Institute of Technology; Brent Fultz, California Institute of Technology

Wednesday AM
March 14, 2012

Room: Northern E4
Location: Dolphin Resort

Funding support provided by: Office of Basic Energy Sciences, U.S. Dept. of Energy, Dr. P. Thiyagarajan

Session Chairs: Emil Bozin, Brookhaven National Laboratory; Nidia Gallego, Oak Ridge National Laboratory

8:30 AM Keynote

Toward an Atomistic Interpretation of Diffraction Line Profile Broadening: *Paolo Scardi*¹; ¹University of Trento

8:55 AM Invited

Local Structural Aspects of the Metal-Insulator Transition in Cu(Ir_{1-x}Crx)₂S₄ from Total Scattering X-Ray Study: *Emil Bozin*¹; ¹Brookhaven National Laboratory

9:15 AM Invited

Industrial Applications at Small Angle Neutron Scattering and Neutron Diffraction of HANARO Reactor: *Baek Seok Seong*¹; Eunjo Shin¹; Young-Soo Han¹; Chuck Woo¹; ¹KAERI

9:35 AM

Internal Stresses and Microstructure Studied by Neutron Diffraction Profile Analysis: Comparison with Other Techniques: *Vadim Davydov*¹; Petr Lukáš²; Martin Petrenek³; Helena Van Swygenhoven¹; Ondrej Man⁴; Pavel Strunz²; Radomír Kužel⁵; ¹Paul Scherrer Institut; ²Nuclear Physics Institute; ³Institute of Physics of Materials; ⁴Brno University of Technology; ⁵Charles University

9:50 AM Invited

Microstructural Mapping Using High-Energy X-Ray Scattering: *Jonathan Almer*¹; ¹Argonne National Laboratory

10:10 AM

New Approach to Measure Lattice Strains under Torsional Shear Using In Situ Neutron Diffraction for Polycrystalline Materials: Robin Woracek¹; *Jeffrey Bunn*²; Dayakar Penumadu²; Camden Hubbard³; ¹University of Tennessee & Helmholtz Zentrum Berlin; ²University of Tennessee; ³Oak Ridge National Laboratory

10:20 AM Break

10:25 AM

Effect of Different Loading Condition on the Accumulation of Internal Strain in a Creep Resistant Bainitic Steel: *Michael A. Weisser*¹; Steven Van Petegem¹; Stuart R. Holdsworth²; Helena Van Swygenhoven¹; ¹Paul Scherrer Institute; ²EMPA

10:40 AM Invited

Verification of Site Occupancies in a Nickel Base Superalloy Using Synchrotron and Neutron Diffraction Techniques Coupled with Atomistic Modeling and High Resolution TEM: *J. Tiley*¹; G. Viswanathan¹; S. Knox²; A. Shiveley¹; S. Nag³; R. Banerjee³; H. Fraser⁴; ¹Air Force Research Laboratory; ²Southwestern Ohio Council for Higher Education/Air Force Research Laboratory; ³Department of Materials Science, University of North Texas; ⁴Department of Materials Science and Engineering, The Ohio State University

11:00 AM

Plastic Deformation of Nanocluster-Strengthened Ferritic Steel Studied by In-Situ Neutron Diffraction: *Alexandru Stoica*¹; Grigoreta Stoica¹; Zhongwu Zhang²; Xun-Li Wang¹; ¹ORNL; ²Auburn University

11:15 AM

In-Situ Neutron Study of Phase Transformation Kinetics under Far-From Equilibrium Conditions in Advanced High-Strength Steels: *Zhenzhen Yu*¹; Zhili Feng¹; Wei Zhang¹; Ke An¹; Rebecca Mills¹; Eliot Specht¹; Xun-Li Wang¹; ¹Oak Ridge National Laboratory

11:30 AM Invited

SANS and QENS Studies of Phase Behavior and Dynamics of Hydrogen Confined in Nanopores: *Nidia Gallego*¹; Cristian Cotesco¹; Dipendu Saha¹; Lilin He¹; Eugene Mamontov¹; Alexander Kolesnikov¹; Yuri Melnichenko¹; ¹Oak Ridge National Laboratory

11:50 AM

Strain-Rate-Effect on the Lattice-Strain Evolution of a Generation-IV-Reactor-Power-Plant Alloy: E-Wen Huang¹; *Shan-Yu Wu*¹; Wei Wu²; Ke An³; Yang Ling³; Chung-Hao Chen⁴; Peter K. Liaw²; ¹Department of Chemical & Materials Engineering and Center for Neutron Beam Applications, National Central University; ²Department of Materials Science and Engineering University of Tennessee; ³Neutron Scattering Sciences Division Oak Ridge National Laboratory; ⁴Department of Mathematics and Computer Science North Carolina Central University

12:05 PM

In-Situ High-Energy X-Ray Study of Effect of High Magnetic Field on the Phase Transition of Antiferromagnetic CoO Crystal: *Gang Wang*¹; ¹Northeastern University

Pb-Free Solders and Other Materials for Emerging Interconnect and Packaging Technologies: Solder Alloy Design for Challenging Applications

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Iver Anderson, Ames Laboratory; Sung Kang, IBM; Albert Wu, National Central Univ; Laura Turbini, Research in Motion; Tae-Kyu Lee, Cisco Systems; Govindarajan Muralidharan, Oak Ridge National Lab; John Elmer, Lawrence Livermore National Lab; Yan Li, Intel

Wednesday AM
March 14, 2012

Room: Swan 9
Location: Swan Resort

Session Chair: To Be Announced

8:30 AM Invited

Influence of Composition on the Morphology of Primary Cu₆Sn₅ in Sn-4Cu Alloys: Kazuhiro Nogita¹; Stuart McDonald¹; Jonathan Read¹; Tina Ventura¹; Motonori Miyaoka²; Keith Sweatman²; Testuro Nishimura²; ¹The University of Queensland; ²Nihon Superior Co. Ltd.

8:55 AM

Relating the Microstructure to the Shear Strength of Fluxless AuSn Solder Bonds: Jeffrey Florando¹; Ilya Golosker¹; Barry Olsen¹; ¹Lawrence Livermore National Laboratory

9:15 AM

The Initial Reflow Interaction between Sn_{3.0}Ag_{0.5}Cu Solder and Ni Metallization: Yu-Wei Lin¹; Kwang-Lung Lin¹; ¹National Cheng Kung University

9:35 AM

Intermetallic Compound Formation and Growth at the Lead-Free Solder/Cu Interface during Laser Reflow Soldering and during Isothermal Aging: Hiroshi Nishikawa¹; Noriya Iwata¹; Tadashi Takemoto¹; ¹Osaka University

9:55 AM

The Effect of Microstructure on the Reliability of Lead Free Solder Joints: Babak Arfaei¹; Liang Yin²; Eric Cotts¹; Peter Borgesen¹; ¹Binghamton University; ²Universal Instruments Corporation

10:15 AM

The Effect of Composition on the Thickness Morphology and Growth of Interfacial Intermetallic in Pb-Free Solders: Keith Sweatman¹; Jonathan Read²; Tetsuro Nishimura¹; Kazuhiro Nogita²; ¹Nihon Superior Co., Ltd.; ²University of Queensland

10:35 AM Break

10:45 AM Invited

The Development and Validation of a New CALPHAD Thermodynamic Database for Lead Free Solders: Paul Mason¹; Pingfang Shi²; Andreas Markström²; Johan Bratberg²; Anders Engstrom²; Qing Chen²; Huashan Liu³; Zhanpeng Jin³; ¹Thermo-Calc Software Inc.; ²Thermo-Calc Software AB; ³Central-South University

11:10 AM

Investigation of Ti-Alloyed Sn-Ag and Sn-Cu Solders for Their Microstructure, Solidification, Mechanical Properties and Interfacial Reactions: W. Chris Chen¹; Sung K. Kang²; C. Robert Kao³; ¹National Taiwan University; ²IBM T.J. Watson Research Center; ³National Taiwan University

11:30 AM

Lead Free Solder Joint Void Growth during Multiple High Temperature Reflows: Yan Li¹; John Moore¹; Rajen Dias¹; Deepak Goyal¹; ¹Intel

11:50 AM

Effect of Temperature on the Mechanical Properties of Cu₆Sn₅ and (Cu,Ni)₆Sn₅: Dekui Mu¹; Han Huang¹; Kazuhiro Nogita¹; ¹The University of Queensland

12:10 PM

Effects of Minor Pd Doping on Microstructural Evolution and Interfacial Reactions in Sn-3.0Ag-0.5Cu-xPd/Cu during Isothermal Aging: Hsiu-Chuan Chuang¹; Jenq Gong Duh¹; Chih-Yuan Cheng²; Jim Wang²; ¹Tsing Hua University; ²Shenmao Technology Inc. Micro Material Institute

Radiation Effects in Ceramic Oxide and Novel LWR Fuels: Computational Modeling of Defect Evolution under Irradiation

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Peng Xu, University of Wisconsin; Jian Gan, Idaho National Laboratory; Ram Devanathan, Pacific Northwest National Laboratory; Edward Lahoda, Westinghouse Electric Company; Michele Manuel, University of Florida; Ramprasad Prabhakaran, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Wednesday AM
March 14, 2012

Room: Macaw 2
Location: Swan Resort

Funding support provided by: The Center for Materials Science of Nuclear Fuel, an Energy Frontier Research Center led by the Idaho National Laboratory

Session Chairs: Ram Devanathan, Pacific Northwest National Laboratory; Michele Manuel, University of Florida

8:30 AM Invited

On the Problem of Void Growth in Irradiated Materials: Anter El-Azab¹; ¹Florida State University

9:00 AM

Interactions of Voids and Grain Boundaries in UO₂ by Molecular Dynamics Simulation: Tsu-Wu Chiang¹; Aleksandr Chernatynskiy¹; Bowen Deng¹; Susan Sinnott¹; Simon Phillpot¹; ¹University of Florida

9:15 AM

Computational Studies of the Formation and Migration of Atomic Defect Clusters in UO₂ under Irradiation: Xian-Ming Bai¹; Anter El-Azab²; Todd Allen³; ¹Idaho National Laboratory; ²Florida State University; ³University of Wisconsin-Madison

9:30 AM

Atomistic Simulation of Radiation Effects in Nano-Grained Cerium Oxide: Amit Kumar¹; Ram Devanathan²; Vaithiyalingam Shutthanandan²; Satyanarayana Kuchibhatla²; Suntharampillai Thevuthasan²; Sudipta Seal¹; ¹University of Central Florida; ²Pacific Northwest National Laboratory

9:45 AM

Electrochemistry of Defects in Irradiated UO₂: Abdel-Rahman Hassan¹; Thomas Hochrainer¹; Jianguo Yu²; Xianming Bai²; Todd Allen³; Anter El-Azab¹; ¹Florida State University; ²Idaho National Laboratory; ³University of Wisconsin



TMS 2012

141st Annual Meeting & Exhibition

10:00 AM Break

10:15 AM Invited

Multi-Scale Modeling of Fission Gas Evolution in UO₂: *Blas Uberuaga*¹; David Andersson¹; Xiang-Yang Liu¹; Pankaj Nerikar¹; Christopher Stanek¹; ¹Los Alamos National Laboratory

10:45 AM

Mesoscale Modeling of Intergranular Bubble Growth and Percolation: *Paul Millett*¹; Michael Tonks¹; ¹Idaho National Laboratory

11:00 AM

Self-Healing Response of Oxides to Irradiation: Dilpuneet Aidhy¹; *Dieter Wolf*¹; ¹Argonne National Laboratory

11:15 AM

Computer Simulation of Dislocation Loop Evolution in Irradiated Cerium Oxide with Lanthanum Dopant: *Yinbin Miao*¹; Aaron Oaks¹; Wei-Ying Chen¹; Bei Ye¹; Brian Kleinfeldt¹; James Stubbins¹; ¹University of Illinois at Urbana-Champaign

11:30 AM

Segregation of Ru to Edge Dislocations in Uranium Dioxide: *Anuj Goyal*¹; Bowen Deng¹; Minki Hong¹; Aleksandr Chernatynskiy¹; Susan Sinnott¹; Simon Phillpot¹; ¹University of Florida

Randall M. German Honorary Symposium on Sintering and Powder-Based Materials: Powder Processing and Consolidation II

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: K. Morsi, San Diego State University; Fernand Marquis, Naval Postgraduate School; John Meyer, Iowa State University; Ahmed El-Desouky, San Diego State University; Eugene Olefsky, San Diego State University

Wednesday AM
March 14, 2012

Room: Oceanic 2
Location: Dolphin Resort

Session Chair: K Morsi, San Diego State University

8:30 AM Invited

Powder Material Principles Applied to Additive Manufacturing: *David Bourell*¹; ¹University of Texas

8:55 AM Invited

Optimizing Ductility and Strength of Ultrafine Grained Nickel via Cryo-Milling and Ceracon Forging: *Yonghao Zhao*¹; T.D. Topping¹; J.F. Bingert²; E.J. Lavernia¹; ¹University of California Davis; ²Los Alamos National Laboratory

9:20 AM Invited

Powder Metallurgy and Terabytes: *Pavan Suri*¹; ¹Heraeus Materials Technology

9:45 AM Invited

Controlling Performance of PM Consolidation in Extrusion: *Wojciech Mistolek*¹; ¹Lehigh University

10:10 AM Break

10:25 AM Invited

Advances in Synthesis and Densification of Heterogeneous Materials: *Fernand Marquis*¹; ¹Naval Postgraduate School

10:50 AM

Processing Challenges of Dual-Matrix Carbon Nanotube Aluminum Composites: *Amal Esawi*¹; Khaled Morsi²; Ihab Salama¹; Hany Saleeb¹; ¹The American University in Cairo; ²San Diego State University

11:15 AM

The Versatility of Combustion Synthesis Processing: *K. Morsi*¹; ¹San Diego State University

Recent Developments in Biological, Electronic, Functional and Structural Thin Films and Coatings: Process-Properties-Performance Correlations I

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Jian Luo, Clemson University; Xing Yang (Mark) Liu, National Research Council Canada; Nancy Michael, University of Texas at Arlington; Roger Narayan, University of North Carolina and North Carolina State University; Choong-un Kim

Wednesday AM
March 14, 2012

Room: Swan 10
Location: Swan Resort

Session Chairs: Nancy Michael, University of Texas at Arlington; Xing Yang (Mark) Liu, National Research Council

8:30 AM Introductory Comments

8:35 AM

Atomic Scale Characterization of the Nanoscaled Structure of Sputtered Fe-C Thin Films: *Xavier Sauvage*¹; Amélie Fillon¹; Jean Marie Le Breton¹; Ben Lawrence²; Michel Perez³; Colin Scott⁴; Arnaud Weck⁵; Chad Sinclair²; ¹University of Rouen, CNRS; ²Department of Materials Engineering, The University of British Columbia; ³Université de Lyon - INSA de Lyon, MATEIS; ⁴ArcelorMittal Research Maizières; ⁵Mechanical Engineering Department, University of Ottawa

9:05 AM

Dependence of Tribology of Carbide Derived Carbon Films on Humidity: *Marcin Thustochowicz*¹; ¹CTLGroup

9:35 AM

Structural and Optical Properties of Silicon Carbonitride Thin Films Deposited by Reactive DC Magnetron Sputtering: *Okan Agirseven*¹; Tolga Tavsanoğlu¹; Esra Ozkan Zayim¹; Onuralp Yucel¹; ¹Istanbul Technical University

9:55 AM

Influence of TIG Re-Melting and RE (La₂O₃) Addition on Microstructure, Hardness and Wear of Ni-WC Composite Coating: Bal Mukund Dhakar¹; *Dheerendra Dwivedi*¹; Satpal Sharma²; ¹Indian Institute of Technology Roorkee; ²Gautam Buddha University

10:25 AM Break

10:40 AM

Evaluation of Mechanical Properties of Ni-Ti Bi-Layer Thin Film: Maryam Mohri¹; *Mahmud Nili-Ahmadaadi*¹; ¹University of Tehran

11:00 AM

Anodic TiO₂ Nanotubular Arrays with Pre-Synthesized Hydroxyapatite - A Promising Approach to Enhance the Biocompatibility of Titanium: *Luning Wang*¹; ¹University of Alberta

11:30 AM

Preparation and Properties of Cu₂ZnSnS₄ Thin Films by Electrodeposition and Sulfurization: *Chao An*¹; Huimin Lu¹; Xi Chen¹; ¹Beihang University

WEDNESDAY AM

12:00 PM

HR-STEM Characterization of Sr₂FeMoO₆ Thin Films Possessing Both High Saturation Magnetization Values and T_c: *Manisha Dixit*¹; Robert Williams¹; Adam Hauser²; Fengyuan Yang²; Hamish Fraser¹; ¹Materials Science and Engineering Department, The Ohio State University; ²Department of Physics, The Ohio State University

Recycling General Sessions: Building Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
Program Organizer: Joseph Pomykala, Alter Trading

Wednesday AM
March 14, 2012

Room: Europe 4
Location: Dolphin Resort

Session Chair: Jeffrey Spangenberg, Argonne National Laboratory

8:30 AM

Ecological Recovery Process for Textile Waste: *Eftalea Carpus*¹; Emilia Visileanu¹; Michaela Dina Stanescu¹; ¹The Research-Development National Institute for Textile and Leather

8:50 AM

Technical Tools for Increasing the Eco-Efficiency of Textile Products: *Emilia Visileanu*¹; Eftalea Carpus¹; ¹The Research-Development National Institute for Textile and Leather

9:10 AM

Characterization of the Chemical Changes and Surface Properties of Carbonated Waste Cement: *Kwang Suk Yoo*¹; Seong-Ho Lee¹; Sun-Ho Hwang¹; Ji-Whan Ahn¹; ¹Korea Institute of Geoscience and Mineral Resources

9:30 AM

Recycling of Flat Glass Waste into Clayey Ceramic: Thais da Costa Caldas¹; Alline Cordeiro Morais¹; Sergio Neves Monteiro¹; *Carlos Fontes Vieira*¹; ¹State University of the North Fluminense Darcy Ribeiro

9:50 AM Break

10:10 AM

A Study on Waste Packaging Containers Generated by Household in Taiwan: *Esher Hsu*¹; Chen-Ming Kuo²; ¹National Taipei University; ²I-Shou University

10:30 AM

Manufacture of Calcium Sulfoaluminate with Alumina Waste: *Ji-Whan Ahn*¹; Sun-Ho Hwang¹; Seong-Ho Lee¹; Kwang Suk Yoo¹; ¹Korea Institute of Geoscience and Mineral Resources

10:50 AM

Recycling of Styrene-Divinylbenzene Copolymer through Sequential Mass-Suspension Polymerization Process: Nathália Campelo¹; Alexandre Umpierre²; *Fabricio Machado*²; ¹Universidade Católica de Brasília; ²Universidade de Brasília

11:10 AM

Modeling of Heavy Metals Ions Adsorption by Polyamidoamine Dendrimers: Mohamed Barakat¹; *J Kuhn*²; ¹KAU University; ²USF

11:30 AM

Mullites Bodies Produced From the Kaolin Residue Using Microwave Energy: *Maria Brasileiro*¹; Romualdo Menezes²; André Rodrigues¹; Gelmires Neves³; Lisiane Santana³; ¹Universidade Federal do Ceará; ²Universidade Federal da Paraíba; ³Universidade Federal de Campina Grande

Refractory Metals 2012: W and Mo Alloys | Structure, Microstructure and Properties

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: Refractory Metals Committee
Program Organizers: Eric Taleff, The University of Texas at Austin; Todd Leonhardt, Rhenium Alloys Inc; Rachel DeLucas, H.C. Starck; Gary Rozak, HC Starck Inc

Wednesday AM
March 14, 2012

Room: Mockingbird 2
Location: Swan Resort

Session Chairs: Todd Leonhardt, Rhenium Alloys Inc.; Gary Rozak, HC Starck Inc

8:30 AM

Brittle to Ductile Transition in Forged Tungsten and Tungsten-Tantalum Alloys: *David Armstrong*¹; J Gibson¹; J Lachanary¹; Angus Wilkinson¹; Steve Roberts¹; Michael Rieth²; ¹University of Oxford; ²Karlsruhe Institute of Technology

8:50 AM

The Re Effect on Fracture Toughness of Mo- and W-Based Alloys for Nuclear Applications
: *Mikhail Sokolov*¹; Evan Ohriher¹; Roger Stoller¹; ¹ORNL

9:10 AM

Room Temperature Fracture Toughness of Mo-41%Re and Mo-47.5%Re Alloys: Dylan Liebl¹; *Jennifer Gaies*²; Mark Opeka²; ¹University of Wisconsin-Madison; ²NSWC Carderock Division

9:30 AM

Stress-Controlled Cyclic Deformation Response of Mo, Mo-Re and Mo-Si Solid Solutions: *Xiao Jiao Yu*¹; Sharvan Kumar¹; ¹Brown University

9:50 AM

Fabrication of Tungsten and Tungsten-Rhenium Alloys via Pulsed Electric Current Sintering: *Jonathan Webb*¹; Cory Sparks²; Mary O'brien¹; Indrajit Charit¹; Darryl Butt²; Megan Frary²; Mark Carroll³; ¹University of Idaho; ²Boise State University; ³Idaho National Laboratory

10:10 AM Break

10:20 AM

Stress-Strain Behavior of Nb Single Crystal Tensile Specimens with Different Grain Orientations: *Di Kang*¹; Derek Baars¹; Aboozar Mapar¹; Payam Darbandi¹; Thomas Bieler¹; Farhang Pourboghrat¹; Chris Compton²; ¹Michigan State University; ²Nat'l Superconducting Cyclotron Lab

10:40 AM

Synthetic 3D Tantalum Microstructures: *Veronica Livescu*¹; John Bingert¹; Davis Tonks¹; Joseph Tucker²; Gregory Rohrer²; ¹Los Alamos National Laboratory; ²Carnegie Mellon University

11:00 AM

Coherent Precipitates in Cr Solid Solution: *Omer Dogan*¹; Xueyan Song²; Michael Gao³; ¹DOE National Energy Technology Laboratory; ²West Virginia University; ³URS

11:20 AM

Strengthening Mechanisms of the Molybdenum-Base Alloy MHC: *Christopher Poehl*¹; Juergen Schatte²; Harald Leitner¹; ¹Montanuniversität Leoben; ²Plansee SE

11:40 AM

Nature and Results of Dynamic Abnormal Grain Growth in Tantalum: *Nicholas Pedrazas*¹; Elizabeth Holm²; Eric Taleff³; ¹The University of Texas at Austin; ²Sandia National Labs

WEDNESDAY AM



TMS 2012

141st Annual Meeting & Exhibition

12:00 PM

Influence of the Heating Rate on the Recrystallization Behavior of Molybdenum: *Sophie Primig*¹; Harald Leitner¹; Wolfram Knabl²; Alexander Lorich²; Helmut Clemens¹; Roland Stickler³; ¹Montanuniversität Leoben; ²Plansee SE; ³Universität Wien

Solid-State Interfaces II: Toward an Atomistic-Scale Understanding of Structure, Properties, and Behavior through Theory and Experiment: Non-metallic Interfaces, Electronic Structures

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Xiang-Yang Liu, Los Alamos National Lab; Douglas Spearot, University of Arkansas; Guido Schmitz, University of Münster; David Seidman, Northwestern University

Wednesday AM
March 14, 2012

Room: Oceanic 7
Location: Dolphin Resort

Funding support provided by: Los Alamos National Laboratory

Session Chairs: Blas Uberuaga, Los Alamos National Lab; Steven Valone, Los Alamos National Lab

8:30 AM Invited

Semiconductor Interfaces – Structure, Properties, and Dopant Segregation: *Wolfgang Windl*¹; ¹Ohio State Univ.

9:00 AM Invited

A First Principles Thermodynamic Study of Si-HfO₂ and Pt-HfO₂ Interfaces: *Rampi Ramprasad*¹; Hong Zhu¹; ¹University of Connecticut

9:30 AM

Interfacial Reconstruction of Au/TiO₂ from ab Initio: Min Yu¹; *Dallas Trinkle*²; ¹Lawrence Berkeley National Laboratory; ²University of Illinois, Urbana-Champaign

9:50 AM

Structure and Properties of the Y₂O₃/Fe Interface from First Principles Calculations: *Samrat Choudhury*¹; Christopher Stanek¹; Blas Uberuaga¹; ¹Los Alamos National Laboratory

10:10 AM Break

10:20 AM Invited

The Structure of Interfaces in GaSb/InAs Superlattices: *Emil Zolotoyabko*¹; ¹Technion

10:50 AM

In Situ TEM Investigations of Wetting-Dewetting Transitions of Ultra-Thin Nickel Films on (100) Silicon Substrates: Andrew Thron¹; *Klaus van Benthem*¹; ¹University of California, Davis

11:10 AM

Hybrid Monte Carlo–Molecular Dynamics Simulations of Nanometer-Scale Y–Ti–O Precipitation in BCC Iron: *Karl Hammond*¹; Lauren Marus²; Hyon-Jee Lee Voigt²; Brian Wirth¹; ¹University of Tennessee, Knoxville; ²University of California, Berkeley

11:30 AM

Phase-Field Simulation of Segregation to Lamellar Interface in Refractory NbSi₂/MoSi₂ Duplex Silicide: Yuichiro Koizumi¹; *Toshihiro Yamazaki*¹; Akihiko Chiba¹; Koji Hagihara²; Takayoshi Nakano²; Koretaka Yuge³; Haruyuki Inui³; ¹Tohoku University; ²Osaka University; ³Kyoto University

11:50 AM

Solute Segregation at Cu/Alumina Interface and Its Influence on Alumina Growth Kinetics in Alumina Dispersion-Strengthened Copper: Jian Wu¹; Jianmin Huang²; Zhuohui Xu²; Xuanhui Qu³; *Shaojun Liu*⁴; ¹Graduate School at Shenzhen, Tsinghua University; ²Shenzhen Zhongjin Lingnan Nonfemet Co., Ltd., Shenzhen; ³University of Science and Technology Beijing; ⁴Central South University

Stochastic Methods in Materials Research: Session II

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee
Program Organizers: Dallas Trinkle, University of Illinois, Urbana-Champaign; Richard Hennig, Cornell University

Wednesday AM
March 14, 2012

Room: Europe 7
Location: Dolphin Resort

Session Chairs: Dallas Trinkle, University of Illinois at Urbana-Champaign; Richard Hennig, Cornell University

8:30 AM Invited

Statistics of Fracture: Weibull, Gumbel and Other Questions...: *Ashvini Shekhawat*¹; Claudio Manzato²; Phani Nukala³; Mikko Alava⁴; Stefano Zapperi⁵; James Sethna¹; ¹Cornell University; ²Universita di Modena e Reggio Emilia; ³Oak Ridge National Laboratory; ⁴Aalto University; ⁵CNR - Consiglio Nazionale delle Ricerche

9:00 AM

Development of a Novel Support Vector Machine (SVM) Model to Predict the Process-Structure-Property Relations in Materials Informatics: *Osama Abuomar*¹; Hongjoo Rhee²; Roger King¹; ¹Department of Electrical and Computer Engineering, Center for Advanced Vehicular Systems (CAVS), Mississippi State University, Mississippi State, MS 39762; ²Center for Advanced Vehicular Systems (CAVS), Mississippi State University, Mississippi State, MS 39762

9:20 AM

Bootstrap Analysis of Experimental Uncertainties Affecting the Accuracy of a Flow Stress Model for Metal Forming: Thomas Henke¹; *Markus Bambach*¹; Gerhard Hirt¹; ¹RWTH Aachen University

9:40 AM Break

9:50 AM Invited

Uncertainty Quantification Of Yield Stress Predictions In Nanocrystalline Nickel: *Lei Cao*¹; Marisol Koslowski¹; ¹Purdue University

10:20 AM

Continuum Theory of Dislocation Cellular Structures: Fractals, Scaling Theories, and X-Ray Diffraction: *Yong Chen*¹; Woosong Choi¹; Stefanos Papanikolaou¹; James Sethna¹; ¹Cornell University

10:40 AM

Stochastic Modeling and Simulation of Fiber Evolution during Melt-Blowing Slag Fiberization: *Dimitrios Gerogiorgis*¹; Dimitrios Panias¹; Ioannis Paspaliaris¹; ¹National Technical University of Athens (N.T.U.A.)

11:00 AM Break

11:10 AM

Thermal Conductivity Prediction of Nano Fluid Using ANN/GA - A Hybrid Approach for a Radiator Design: *Payodhar Padhi*¹; France Behera¹; Debashish paNDA¹; ¹Konark Institute of Science & Technology

11:30 AM

Effect of Discrete Particle Size Distribution of Iron Ore on the Porosity in Fluidization Process: *Guoliang Yin*¹; *Liangying Wen*¹; ¹Chongqing University

11:50 AM

Research on Prediction of the Stability of Partially Stabilized Zirconia Prepared by Microwave Heating Using Levenberg Marquardt-Back Propagation Neural Network: *Lijun Liu*¹; *Shenghui Guo*¹; *Dongbo Li*¹; *Jinhui Peng*¹; *Guo Chen*¹; *Lei Xu*¹; ¹Faculty of Metallurgical and Energy Engineering, Kunming University of Science and Technology; Key Laboratory of Unconventional Metallurgy, Ministry of Education; Engineering Laboratory of Microwave Application and Equipment Technology, Yunnan Province

Symposium in Memory of Patrick Veyssi re: Understanding the Mechanisms Controlling Plastic Flow: Nanograined Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division

Program Organizers: Georges Saada, LEM CNRS ONERA; Dennis Dimiduk, Air Force Research Laboratory; Hael Mughrabi, University Erlangen-Nuernberg; Haruyuki Inui, Kyoto University

Wednesday AM
March 14, 2012

Room: Europe 6
Location: Dolphin Resort

Funding support provided by: National Science Foundation

Session Chairs: D. Dimiduk, AFRL/RXLM; E. Georges, Ohio State University

8:30 AM Invited

Fabrication Routes and the Effect of Microstructure on the Mechanical Behavior of Ni-Base Superalloy Thin Films and MEMS Structures: *Devin Burns*¹; *Yong Zhang*¹; *Timothy Weihs*¹; *Kevin Hemker*¹; ¹Johns Hopkins University

8:55 AM Invited

Following Deformation Mechanisms in Nanocrystalline Ni Using In Situ Synchrotron Techniques and Orientation Imaging: *Patric Gruber*¹; *Jochen Lohmiller*¹; *Oliver Kraft*¹; *Christian Braun*²; *Manuel Grewer*²; *Rainer Birringer*²; *Aaron Weis*³; *Christian Kuebel*⁴; *Veijo Honkimaki*⁵; ¹Karlsruhe Institute of Technology, Institute for Applied Materials, P.O. Box 3640, 76021 Karlsruhe, Germany; ²Universit t des Saarlandes, Lehrstuhl f r Experimentalphysik, Campus D2 2, 66041 Saarbr cken, Germany; ³Karlsruhe Institute of Technology, Institute of Nanotechnology, P.O. Box 3640, 76021 Karlsruhe, Germany; ⁴Karlsruhe Institute of Technology, Institute of Nanotechnology, P.O. Box 3640, 76021 Karlsruhe, Germany and Karlsruhe Institute of Technology, Karlsruhe Nano Micro Facility, Herrmann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany; ⁵European Synchrotron Radiation Facility, Materials Science Group, BP 220, 38043 Grenoble Cedex, France

9:15 AM Invited

Studying the Micromechanical Behavior of fcc/bcc Metals by Quantitative In-Situ TEM and μ -Laue: *Daniel Kiener*¹; *Andreas Schneider*²; *Nobumichi Tamura*³; *Martin Kunz*³; *Andrew Minor*⁴; *Patric Gruber*⁵; ¹University of Leoben; ²INM - Leibnitz Institute for New Materials; ³Lawrence Berkeley National Laboratory; ⁴University of California; ⁵KIT - Karlsruhe Institute of Technology

9:45 AM Break

10:00 AM Invited

Understanding the Small-Scale Plasticity of Pillars in Compression and Fibers in Tension: *E. P. George*¹; *P. Sudharshan Phani*²; *K. E. Johanns*²; *G. M. Pharr*²; ¹Oak Ridge National Laboratory; ²University of Tennessee

10:25 AM Invited

Deformation Mechanisms in Nanocrystalline Alloys: *Steven Van Petegem*¹; *Julien Zimmermann*¹; *Helena Van Swygenhoven*¹; ¹Paul Scherrer Institute

11:00 AM Invited

Two Strain Hardening Mechanisms in Nanocrystalline Austenitic Fe-Cr-Ni-W Steel: *Michael A. Weisser*¹; *Helena Van Swygenhoven*¹; *Patrick Schloth*¹; *Steven Van Petegem*¹; *V. Subramanya Sarma*²; *Martin Heilmair*³; ¹Paul Scherrer Institute; ²Indian Institute of Technology Madras; ³TU Darmstadt

11:30 AM Invited

Deformation, Strengthening and Intermittency Behavior of Ni3Al Alloy Microcrystals: *Dennis Dimiduk*¹; *Michael Uchic*¹; *Satish Rao*²; *Paul Shade*¹; *Chris Woodward*¹; *Ed Nadgorny*³; ¹Air Force Research Laboratory; ²UES, Inc.; ³Michigan Technological University

Titanium: Advances in Processing, Characterization and Properties: Fatigue of Titanium Alloys

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Christopher Szczepanski, US Air Force Research Laboratory; Vasisht Venkatesh, Pratt & Whitney

Wednesday AM
March 14, 2012

Room: Oceanic 3
Location: Dolphin Resort

Session Chairs: Sushant Jha, UTC/US Air Force Research Laboratory; Matt Brandes, The Ohio State University; Chris Szczepanski, US Air Force Research Laboratory

8:30 AM Invited

Understanding Fatigue of Ti Alloys: *James Williams*¹; ¹The Ohio State University

9:00 AM Invited

3D Observations of Short Fatigue Crack Interaction with Lamellar and Duplex Microstructures in a Two-Phase Titanium Alloy: *Soran Biroscak*¹; ¹University of Cambridge

9:30 AM

Experimental Correlation Between a Microscopic Non-Local Strain Parameter and Macroscopic Fatigue Crack Growth in Beta-Annealed Ti-6Al-4V: *Pedro Peralta*¹; *Thomas Villarreal*¹; *Ikshwaku Atodaria*¹; *Aditi Chattopadhyay*¹; ¹Arizona State University

9:50 AM

Microstructural Crack Initiation and Growth during the High Cycle Fatigue Damage of a Ti-6Al-4V Alloy: *Edward Chen*¹; ¹Transition45 Technologies, Inc.

10:10 AM

Monitoring of Small Fatigue Crack Initiation and Evolution in Ti Alloys: *Stan Rokhlin*¹; *George Connolly*¹; *Jia Li*¹; *Bahman Zoofan*¹; ¹The Ohio State University



TMS 2012

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10:30 AM Break

10:40 AM Invited

Deformation and Fracture in Titanium Alloys: Microscale Characterization: *M Brandes*¹; ¹The Ohio State University

11:10 AM

Dislocation Level Mechanisms of Dwell Fatigue Crack Initiation and Propagation in Near-Alpha Titanium: *Matt Brandes*¹; *Adam Pilchak*²; *Robert Williams*¹; *Michael Mills*¹; *Hamish Fraser*¹; *James Williams*¹; ¹The Ohio State University; ²Air Force Research Laboratory

11:30 AM

Micromechanisms of Fatigue in Ti-5Al-5Mo-5V-3Cr: *Nicholas Jones*¹; *David Dye*¹; *Trevor Lindley*¹; ¹Imperial College London

T.T. Chen Honorary Symposium on Hydrometallurgy, Electrometallurgy and Materials Characterization: Precious Metals, Recycling and the Environment

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee

Program Organizers: *Shijie Wang*, Rio Tinto Kennecott Utah Copper; *J. E. Dutrizac*, CANMET; *Michael Free*, University of Utah; *J. Y. Hwang*, Michigan Technological University; *Daniel Kim*, Rio Tinto Kennecott Utah Copper

Wednesday AM
March 14, 2012

Room: Oceanic 5
Location: Dolphin Resort

Funding support provided by: Rio Tinto Kennecott Utah Copper, ASARCO, and Freeport McMoRan

Session Chair: *Bradford Weststrom*, Freeport-McMoRan El Paso Refinery

8:30 AM

Simulating the Blanking of Preg Robbers in Gold Ores by Treating Activated Carbon with Hard Paraffin Wax: *Gus Van Weert*¹; *John Jiang*²; *Olivia Wang*³; *Yeonuk Choi*²; ¹ORETOME Limited; ²Barrick Gold Corporation; ³Process Research ORTECH

8:50 AM

Dissolution of Platinum, Palladium and Rhodium in 250g/l NaCl Solution: *Kristian Lillkung*¹; *Jari Aromaa*¹; *Olof Forsén*¹; ¹Aalto University, School of Chemical Technology

9:10 AM

Silver Recovery from Complex Concentrates- A Mineralogical Approach: *Joe Ferron*¹; ¹Hydroproc

9:30 AM

Development of New Recycling Process of PGMs: *Toru Okabe*¹; *Junpei Mitsui*¹; *Katsuhiro Nose*¹; ¹The University of Tokyo

9:50 AM

Molybdenum Recovery and Impurity Removal from Smelter Dusts: *Troy Bednarski*¹; *Violina Cocalia*¹; *Tyler McCallum*¹; *Matthew Soderstrom*¹; *Alexis Soto*²; ¹Cytec Industries Inc., USA; ²Cytec Chile Ltda

10:10 AM Break

10:30 AM

Acid Separation for Impurity Control and Acid Recycle using Short Bed Ion Exchange: *Michael Sheedy*¹; *Paul Pajunen*¹; ¹Eco-Tec Inc.

10:50 AM

Various Arsenic Treatments in Non-Ferrous Metallurgy and Other Potential Applications: *Tetsuo Fujita*¹; *Shun Fujieda*²; *Kozo Shinoda*²; *Shigeru Suzuki*²; ¹Dowa Metals & Mining company limited; ²Tohoku University

11:10 AM

New Vermiculite-Copper Nanoparticle Product with Antibacterial Properties: *Jaroslav Drellich*¹; *Bowen Li*¹; *Jiann-Yang Hwang*¹; ¹Michigan Technological University

11:30 AM

Scorodite Solubility and Storage Management Systems for Arsenic-Bearing Compounds: *Tetsuo Fujita*¹; *Shun Fujieda*²; *Kozo Shinoda*²; *Shigeru Suzuki*²; ¹Dowa Metals & Mining Company Limited; ²Tohoku University

Ultrafine Grained Materials VII: Advanced Analysis Methods

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee

Program Organizers: *Suveen Mathaudhu*, U.S. Army Research Office; *Xiaoxu Huang*, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; *Hyoung Seop Kim*, POSTECH; *Terence Langdon*, University of Southern California; *Terry Lowe*, Manhattan Scientifics, Inc.; *Ruslan Valiev*, Ufa State Aviation Technical University; *Xiaolei Wu*, Institute of Mechanics, Chinese Academy of Sciences; *Michael Zehetbauer*, University of Vienna

Wednesday AM
March 14, 2012

Room: Swan 4
Location: Swan Resort

Session Chairs: *Malgorzata Lewandowska*, Warsaw University of Technology; *Peter Liddicoat*, The University of Sydney; *M. Ravi Shankar*, University of Pittsburgh; *Marco Starink*, University of Southampton

8:30 AM Invited

Neutron Scattering Studies on the Stability of Texture in Cu/Nb Nanolamellar Composites Fabricated via Accumulative Roll Bonding: *John Carpenter*¹; *Sven Vogel*¹; *Irene Beyerlein*¹; *Nathan Mara*¹; ¹Los Alamos National Laboratory

8:50 AM

Homogeneity of SPD Processed Ultrafine Grained Aluminium: *Malgorzata Lewandowska*¹; *Michal Przybysz*¹; *Mariusz Kulczyk*²; *Waclaw Pachla*²; ¹Warsaw University of Technology; ²Institute of High Pressure Physics PAS

9:05 AM

In Situ Measurements of Deformation Strain and Strain-Rate in Equal Channel Angular Pressing: *Saradhi Koneru*¹; *Saurabh Basu*¹; *M. Ravi Shankar*¹; ¹University of Pittsburgh

9:20 AM Invited

Influence of Alloying on a Strain Induced Grain Growth in Nanocrystalline Pd: *Lilia Kurmanaeva*¹; *Yulia Ivanisenko*¹; ¹Institute of Nanotechnology, KIT

9:40 AM

Nanostructural Evolution in Hierarchy-Strengthened Al-Mg Alloys: *Peter Liddicoat*¹; *Maxim Murashkin*²; *Xiaozhou Liao*¹; *Ruslan Valiev*²; *Simon Ringer*¹; ¹The University of Sydney; ²Ufa State Aviation Technical University

WEDNESDAY AM

9:55 AM

Validation and Analysis of a Model for Grain Refinement by Cold Severe Plastic Deformation: *Marco Starink*¹; Xiaoguang Qiao¹; Nong Gao¹; ¹University of Southampton

10:10 AM Break

10:25 AM Invited

Spatial Distribution of the Dislocation Density and the Strength of Nb and Ta Deformed by High-Pressure-Torsion Determined by X-Ray Peak Profile Analysis: Bertalan Jóni¹; Erhard Schafner²; *Tamás Ungár*¹; Michael Zehetbauer²; ¹Eötvös University Budapest, Hungary; ²University of Vienna, Austria

10:45 AM

Mapping Microstructures Resulting from Severe Simple Shear Deformation: Sepideh Abolghasem¹; Saurabh Basu¹; Shashank Shekhar¹; Jiazhao Cai¹; *M. Ravi Shankar*¹; ¹University of Pittsburgh

11:00 AM

A Crystal Plasticity FEM Study about Influence of Crystal Orientation on the Texture Evolution and Heterogeneity of ECAPed Copper Single Crystals: *Guanyu Deng*¹; Cheng Lu¹; Lihong Su¹; Kiet Tieu¹; Xianghua Liu²; ¹University of Wollongong; ²Northeastern University

11:15 AM Invited

Using Deformation Mechanism Map to Depict Flow Processes in Superplastic Ultrafine-Grained Materials: *Megumi Kawasaki*¹; Terence Langdon¹; ¹University of Southern California

11:35 AM

Modeling Temperature-Dependent Mechanical Response of UFG Al-1100 at High Strain Rates: *Emily Huskins*¹; K.T. Ramesh¹; ¹Johns Hopkins University

Ultrafine Grained Materials VII: Powder Processing

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Xiaoxu Huang, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; Hyoung Seop Kim, POSTECH; Terence Langdon, University of Southern California; Terry Lowe, Manhattan Scientifics, Inc.; Ruslan Valiev, Ufa State Aviation Technical University; Xiaolei Wu, Institute of Mechanics, Chinese Academy of Sciences; Michael Zehetbauer, University of Vienna

Wednesday AM
March 14, 2012

Room: Swan 5
Location: Swan Resort

Session Chairs: Mikheil Chikhradze, Georgian Technical University; David Tingaud, Université Paris 13- Institut Galilée; Hyoung Seop Kim, POSTECH; Troy Topping, University of California, Davis

8:30 AM Invited

Stress-Induced Grain Growth in Ultra-Fine Grained 5083 Al during Hot Extrusion: Yaojun Lin¹; Ying Li¹; *Enrique Lavernia*¹; ¹University of California, Davis

8:50 AM

Large Scale Powder Processing of High Strength Copper Alloys: *Joseph Paras*¹; Kris Darling²; Laszlo Kecskes²; Suveen Mathaudhu²; Deepak Kapoor¹; ¹U.S. Army ARDEC; ²U.S. Army Research Laboratory; ³U.S. Army Research Office

9:05 AM

Mechanical Properties of Nanocrystalline Cu-, Mg-, and Fe-Base Alloys from In-Situ and HPT Consolidated Ball-Milled Powders: *Khaled Youssef*¹; Daria Setman²; Michael Zehetbauer²; Suhrit Mula³; Pengchao Kang⁴; Ronald Scattergood¹; Carl Koch¹; ¹North Carolina State University; ²University of Vienna; ³National Institute of Technology; ⁴Harbin Institute of Technology

9:20 AM Invited

Microstructure Features, Strengthening Mechanisms and Hot Deformation Behavior of Oxide-Dispersion Strengthened Al6063 Alloy with Ultrafine-Grained Structure: *A. Simchi*¹; H. Asgharzadeh¹; H.S. Kim²; ¹Sharif University of Technology; ²Pohang University of Science and Technology

9:40 AM

Microstructure and Mechanical Properties of Polycrystalline Nickel with Controlled Micro/Nano Grain Volume Fractions: Guy-Daniel Kollo¹; *David Tingaud*¹; Guy Dirras¹; ¹Université Paris 13- Institut Galilée

9:55 AM

Nickel with Multimodal Grain Size Distribution Achieved by SPS: Microstructure and Mechanical Properties: Guy-Daniel Kollo¹; *David Tingaud*¹; Guy Dirras¹; ¹Université Paris 13- Institut Galilée

10:10 AM

Quantifying Strengthening Mechanisms in Cryomilled Al Alloys and Their Composites: *Troy Topping*¹; Zhihui Zhang¹; Ying Li¹; Enrique Lavernia¹; ¹University of California, Davis

10:25 AM Break

10:40 AM

Mechanics of Powder Equal Channel Angular Pressing: *Hyoung Seop Kim*¹; ¹POSTECH

10:55 AM

Microstructure Evolution and Mechanical Behavior of Ultrafine Grain Structured Al 7075 Developed by Cryomilling: *Kaka Ma*¹; Troy Topping¹; Enrique Lavernia¹; Julie Schoenung¹; ¹University of California, Davis

11:10 AM

Explosive Fabrication of Bulk Ultrafine Grained Al-Ni-Ti Composite Materials: Nikoloz Chikhradze¹; Akaki Gigineishvili¹; *Mikheil Chikhradze*¹; ¹Mining Institute/Georgian Technical University

11:25 AM

Mechanical Properties of Nanostructured Al-Bi Alloys: *Koteswararao Rajulapati*¹; Sreedevi Varam¹; K Bhanu Sankara Rao¹; ¹University of Hyderabad

11:40 AM

Effect of Grain Size Distribution and Zr Addition on Mechanical Properties and Oxidation Resistance of Fe-Cr-Ni Alloys: *Mahesh Venkataraman*¹; Raman Singh¹; Carl Koch²; ¹Monash University; ²North Carolina State University

11:55 AM

Comparison of Structure and Properties of Nanomaterials Processed by Ball Milling and High Pressure Torsion: *Jelena Horky*¹; Daria Setman¹; Michael Kerber¹; Hamed Bahmanpour²; Carl Koch²; Ron Scattergood²; Michael Zehetbauer¹; ¹University of Vienna; ²North Carolina State University

12:10 PM

Synthesis and Characterization of Binary Al-Mn Alloys for Structural Applications: *Lauren Armstrong*¹; Rajendra Sadangi¹; Kris Darling²; Chris Haines¹; Deepak Kapoor¹; ¹US Army, ARDEC; ²US Army, ARL



TMS 2012

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MONDAY AM

12:25 PM

Grain Size Dependence of Deformation Microstructure Formation in Compressed Aluminum: *Guomin Le*¹; Andy Godfrey¹; Xiaoxu Huang²; Niels Hansen²; Grethe Winther²; ¹Tsinghua University; ²Risø National Laboratory for Sustainable Energy, Technical University of Denmark

Ultrasonic Fatigue of Advanced Materials and Systems:

Ultrasonic Fatigue of Metals and Alloys I

Sponsored by: The Minerals, Metals and Materials Society, State Research Center for Mathematical and Computational Modelling, University of Kaiserslautern, Germany, State Research Focus "Advanced Materials Engineering", University of Kaiserslautern, Germany, TMS Light Metals Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Materials Characterization Committee, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Young Leaders Committee
Program Organizers: Frank Balle, University of Kaiserslautern; Dietmar Eifler, University of Kaiserslautern; Guntram Wagner, University of Kaiserslautern

Wednesday AM
March 14, 2012

Room: Europe 1
Location: Dolphin Resort

Session Chairs: Frank Balle, University of Kaiserslautern (Germany); Dietmar Eifler, University of Kaiserslautern (Germany); Guntram Wagner, University of Kaiserslautern (Germany)

8:30 AM Introductory Comments: Frank Balle, Symposium organizer-in-chief

8:35 AM

A Method for In Situ Capture of Cyclic Strain Accumulation during Ultrasonic Fatigue of Structural Alloys: *Jason Geathers*¹; Samantha Daly¹; J. Wayne Jones¹; ¹University of Michigan

8:55 AM

Influence of Grain Size and Precipitates on the Fatigue Lives and Deformation Mechanisms in the VHCF-Regime: *Heinz Werner Höppel*¹; ¹University Erlangen-Nürnberg

9:15 AM Invited

Ultrasonic Fatigue Testing at Different Load Ratios under Constant and Variable Amplitude: *Herwig Mayer*¹; Michael Fitzka¹; Reinhard Schuller¹; Stefanie Stanzl-Tschegg¹; ¹BOKU, Institute of Physics and Material Science, Vienna

9:35 AM Break

10:05 AM Keynote

Damage Mechanisms in the VHCF Regime in Quasi Defect-Free Metals Regarding Different Levels of Microstructural Inhomogeneity: *Martina Zimmermann*¹; Hans-Juergen Christ¹; ¹Universitaet Siegen

10:35 AM

Local Cyclic Plastic Deformation and Damage during Ultrasonic Fatigue: *Guocai Chai*¹; ¹Sandvik Materials Technology

10:55 AM

Comparison of Fatigue Property of Metallic Materials under Conventional and Ultrasonic Testing Methods: *Benjamin Guennee*¹; Yuki Nakamura²; Tatsuo Sakai¹; Akira Ueno¹; Isamu Nonaka³; ¹Ritsumeikan University; ²Toyota National College of Technology; ³Tohoku University

11:15 AM

Basic Need of Standardization for Ultrasonic Fatigue Testing: *Claude Bathias*¹; ¹University Paris Pocest

2012 Functional and Structural Nanomaterials: Fabrication, Properties, Applications and Implications: Structural Nanomaterials

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Jiyoung Kim, University of Texas; David Stollberg, Georgia Tech Research Institute; Seong Jin Koh, University of Texas at Arlington; Nitin Chopra, The University of Alabama; Terry Xu, UNC Charlotte

Wednesday PM
March 14, 2012

Room: Pelican 1
Location: Swan Resort

Session Chair: Yonghao Zhao, Nanjing University of Science and Technology

2:00 PM Invited

Mechanical Properties and Deformation in Multi-scale Nanostructured Cu and Ti: *Yonghao Zhao*¹; Y. Li²; T. Topping²; Y.T. Zhu³; R.Z. Valiev⁴; E.J. Lavernia²; ¹University of California Davis; Nanjing University of Science and Technology; ²University of California Davis; ³North Carolina State University; ⁴Ufa State Aviation Technical University

2:35 PM

Mechanical Behavior of Bulk Diamantane Stabilized Aluminum Matrix Nanocomposites: *Khinlay Maung*¹; Colin Arnold¹; Ali Yousefiani²; Farghalli Mohamed¹; *James Earthman*¹; ¹University of California, Irvine; ²Boeing Research & Technology

2:55 PM

Mechanical Characterization of Alumina In-Situ Aluminum Di-Borides Nano Composites: *Sudeep Ingole*¹; Zulfiqar Khan²; Rajeshwari Paluri¹; Fevzi Ozaydin¹; ¹Texas A&M University; ²Bournemouth University

3:15 PM

Phase Transformations during Mechanical Alloying of Ni-Al-Cr Powders Mixture to Produce Nanocrystalline Intermetallic Compounds: *M.H. Enayati*¹; A. R. Shirani²; A. Shokohfar³; ¹Isfahan University of Technology; ²Azad University; ³Khaje Nasir Toosi Technical University

3:35 PM Break

3:50 PM

Synthesis of Gold, Manganese and Nickle Alloy Films Possessing Nano and Various Microstructures: *Bassey Udofot*¹; ¹Aerospace

4:10 PM

Formation of Aluminum Di-Borides in Alumina Matrix Through Mechanical Mixing for Tribological Applications: *Sudeep Ingole*¹; *Fevzi Ozaydin*¹; Rajeshwari Paluri¹; ¹Texas A&M University

4:30 PM

Fabrication and Characterization of Porous Zinc via Selective Dealloying of Al-Zn Alloys: *Elvin Estremera*¹; Rafael Soler¹; Amarilis Declat¹; Ulises Barajas-Valdes¹; O. Marcelo Suarez²; ¹University of Puerto Rico

4:45 PM

Refinement of Ligaments of Nanoporous Ag Ribbons by Controlling the Surface Diffusion of Ag: *Tingting Song*¹; Yulai Gao¹; Zhonghua Zhang²; Qijie Zhai¹; Shanghai University; ²Shandong University

5:00 PM

Synthesis and Morphology of Nanoporous Cu and Cu Oxide Foams: *I-Chung Cheng*¹; Andrea Hodge¹; ¹University of Southern California

5:15 PM

Pulsed Laser Melting and Solidification of Metallic Nanoparticles: *Ritesh Sachan*¹; S. Yadavali¹; N. Shirato¹; A. Gangopadhyay²; G. Duscher¹; R. Kalyanaraman¹; ¹University of Tennessee-Knoxville; ²Washington University

2012 Symposium on Surfaces and Heterostructures at Nano- or Micro-Scale and Their Characterization, Properties, and Applications: I-Chemical Sensing and Devices II-Biomaterials and Applications

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS: Energy Conversion and Storage Committee, TMS: Nanomaterials Committee, TMS: Surface Engineering Committee, TMS: Young Leaders Committee, TMS: EMPMD Council
Program Organizers: Nitin Chopra, The University of Alabama; Ramana Reddy, The University of Alabama; Arvind Agarwal, Florida International University; Sandip Harimkar, Oklahoma State University; Jiyoung Kim, University of Texas at Dallas; Christopher Matranga, National Energy Technology Laboratory

Wednesday PM
March 14, 2012

Room: Pelican 2
Location: Swan Resort

Session Chairs: Nitin Chopra, The University of Alabama; Ramana Reddy, The University of Alabama

2:00 PM Invited

Nanometal-on-Semiconductor Substrates for Single-Molecule Spectroscopy: *Kaan Kalkan*¹; ¹Oklahoma State University

2:30 PM Invited

Plasmonics Based Harsh Environment Compatible Chemical Sensors: *Michael Carpenter*¹; ¹University at Albany-SUNY

3:00 PM

2012 Shri Ram Arora Award: Novel Sensor Structure of SnO₂ Thin Film Integrated with Catalytic Micro-Discs for the Detection of Trace Level NO₂ Gas: *Anjali Sharma*¹; Monika Tomar¹; Vinay Gupta¹; ¹University of Delhi

3:35 PM Invited

Sub-Nanometer Scale Nanostructures: Ultrathin Nanowires and Nanoclusters
: *Yuping Bao*¹; Yaolin Xu¹; Soubantika Palchoudhury¹; ¹The University of Alabama

4:05 PM

Magnetic Particles Accumulated in Acidithiobacillus Ferrooxidans Cells under Static Magnetic Field Affection: *Hongxu Li*¹; Chao Li¹; Zhi Qian Zhang¹; Lin Wang¹; ¹University of Science and Technology

4:20 PM

Nanotechnology For Drug Formulation: Improving Solubility of Insoluble Drugs: *Aeriel Murphy*¹; Dennis Leung²; ¹University of Alabama; ²Merck Sharp & Dohme Corporation Inc.

4:35 PM

Tunable and Functional Silica Cross-Linked Micellar Core-Shell Nanoparticles: *Fangli Chi*¹; Bin Yang¹; Qisheng Huo²; Jihua Chen¹; ¹Florida International University; ²Jilin University

4:50 PM

Vertically Aligned and Axially Heterostructured Metal Nanowires and Their Soft Composites: *Junchi Wu*¹; Nitin Chopra¹; ¹The University of Alabama

5:05 PM

Superhydrophobic Properties of Polymethylmethacrylate (PMMA) Nano Modified: *Ariosvaldo Sobrinho*¹; Marcos Baracho²; Luiz Pontes³; Daniel Campos⁴; Analgia Araujo¹; Geilza Porto¹; ¹UAEMA / UFCG; ²UAEC / UFCG; ³DTM / UFPB; ⁴UAEG / UFCG

5:20 PM

The Bioadsorption Behavior of Rhodococcus Opacus on the Surface of Calcium and Magnesium Minerals: *Hongxu Li*¹; An Li¹; Binbin Liu¹; ¹University of Science and Technology

5:35 PM

The Formation of an Eutectic Mixture for Predicting the Ideal Solubility of Thermally Stable and Unstable Compounds: *Rodolfo Pinal*¹; Ryan McCain¹; ¹Purdue University

5:50 PM Invited

Microstructure and Mechanical Properties of Multistructured Peacock Feathers: Neelima Mahato¹; Debrupa Lahiri²; Arvind Agarwal²; *Kantesh Balani*¹; ¹Indian Institute of Technology Kanpur; ²Florida International University

6:20 PM

Production of Various Silicates from Rice Hull Ash: *Ozgul Taspinar*¹; Evre Sadic¹; Onur Ozcan¹; ¹Istanbul Technical Univ.

3rd International Symposium on High Temperature Metallurgical Processing: Energy and Environment

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Energy Committee, TMS: Pyrometallurgy Committee
Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Patrick Masset, TU Freiberg; Onuralp Yucel, Istanbul Technical University; Rafael Padilla, University of Concepcion; Guifeng Zhou, Wuhan Iron and Steel

Wednesday PM
March 14, 2012

Room: Southern II
Location: Dolphin Resort

Session Chairs: Mansoor Barati, University of Toronto; Hongmin Zhu, University of Science & Technology Beijing

2:00 PM

Current Status of Heat Recovery from Granulated Slag: *Shaghayegh Esfahani*¹; Mansoor Barati¹; ¹University of Toronto

2:15 PM

Contribution to the Energy Optimization in the Pyrometallurgical Treatment of Greek Nickeliferous Laterites: Konstantinos Karalis¹; Charalabos Zografidis²; *Anthimos Xenidis*¹; Stelios Tabouris²; Eamonn Devlin³; ¹National Technical University of Athens; ²General Mining and Metallurgical Company S.A. LARCO; ³NCSR Demokritos

2:30 PM

Strengthening Sintering of Refractory Iron Ore with Biomass Fuel: *Xiaohui Fan*¹; Zhiyun Ji¹; Min Gan¹; Xuling Chen¹; Wenqi Li¹; ¹Central South University



TMS 2012

141st Annual Meeting & Exhibition

2:45 PM

Combustion Behavior of Pulverized Coal Injection in Corex Melter Gasifier: *Zhang Shengfu*¹; Zhu Feng¹; Bai Chenguang¹; Wen Liangying¹; Qiu Guibao¹; Hu Meilong¹; Qin Yuelin¹; ¹College of Materials Science & Engineering, Chongqing University

3:00 PM

Improved Short Coil Correction Factor for Induction Heating of Billets: *Mark Kennedy*¹; Shahid Akhtar²; Jon Arne Bakken²; Raghild Aune²; ¹Norwegian University of Science and Technology; ²Norwegian University of Science and Technology

3:15 PM

Liberation of Metallic-Bearing Minerals from Host Rock Using Microwave Energy: *Matthew Andriese*¹; Jiann-Yang Hwang¹; Zhiwei Peng¹; ¹Michigan Technological University

3:30 PM Break

3:40 PM

Effects of Binders Additives on Compressive Strength of Hematite Pellets in Firing Process: *Yanfang Huang*¹; Guihong Han¹; Tao Jiang¹; Guanghui Li¹; Yuanbo Zhang¹; Dan Wang¹; ¹Central South University

3:55 PM

Mechanisms of NO Formation during SiO Combustion: *Nils Eivind Kamfford*¹; Halvard Tveit¹; Edin Myrhaug²; Mari Næss¹; ¹NTNU; ²ELKEM

4:10 PM

New Technologies of Energy Saving and Low CO₂ Emission for Iron Making: *Xiuwei An*¹; Jingsong Wang¹; Qingguo Xue¹; ¹University of Science and Technology Beijing

4:25 PM

Pilot Scale Measurements of NO_x Emissions from the Silicon Process: *Nils Eivind Kamfford*¹; Ingeborg Solheim²; Halvard Tveit¹; ¹NTNU; ²SINTEF

4:40 PM

The Effect of Thermal State of Raw Pellets on the Strength of Reduced Pellets: *Zhu-Cheng Huang*¹; Daoguang Yang¹; Ling-Yun Yi¹; ¹Central South University

Aluminum Alloys: Fabrication, Characterization and Applications: Emerging Technologies

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Processing Committee
Program Organizers: Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum

Wednesday PM
March 14, 2012

Room: Northern E1
Location: Dolphin Resort

Session Chair: Subodh Das, Phinix

2:00 PM

Effect of Tool Rotational Speed on the Microstructures and Tensile Properties of 7075 Aluminum Alloy Via Friction Stir Process (FSP): *Ming-Hsiang Ku*¹; Fei-Yi Hung¹; Truan-Sheng Lui¹; Li-Hui Chen¹; ¹National Cheng Kung University

2:20 PM

Improving Microstructure of AISI H13 Extruding Dies Using Ion Nitriding: *Francisco Montalvo*¹; *Eulogio Velasco*²; *Adrian Canales*¹; ¹CUPRUM; ²Texas State University

2:40 PM

Linear Friction Welding of a 2024 Al Alloy: Microstructural, Tensile and Fatigue Properties: *Alessandro Morri*¹; *Lorella Ceschini*¹; *Fabio Rotundo*¹; ¹University of Bologna

3:00 PM

The Effect of Friction Stir Welding on the Microstructure and Tensile Properties of Al 2139-T8 Alloys: *Tomoko Sano*¹; *Jian Yu*¹; *Chian-Fong Yen*¹; *Kevin Doherty*¹; ¹US Army Research Laboratory

3:20 PM Break

3:35 PM

Friction Stir Welding of Al- Zn- Mg Alloy AA7039: *Chaitanya Sharma*¹; *Dheerendra Dwivedi*¹; *Pradeep Kumar*¹; ¹Indian Institute of Technology Roorkee

3:55 PM

Fabrication and Particle Pushing of TiB₂ Particle Reinforced Aluminum Composites: *Meng Wang*¹; *Qingyou Han*¹; ¹Purdue University

4:15 PM

Post Weld Heat Treatment of Friction Stir Welded AA2017: *Mohamed Ahmed*¹; *Bradley Wynne*²; ¹Suez Canal University; ²The University of Sheffield

Aluminum Reduction Technology: Cell Fundamentals, Phenomena and Alternatives II

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Olivier Martin, Rio Tinto Alcan

Wednesday PM
March 14, 2012

Room: Northern E4
Location: Dolphin Resort

Session Chair: Patrice Chartrand, Ecole Polytechnique Montreal

2:00 PM

Cryoscopic Data for Hall-Héroult Bath Containing Magnesium Fluoride, Calcium Fluoride, Potassium Cryolite, and Sodium Chloride: *Asbjorn Solheim*¹; *Lisbet Stoen*¹; *Jannicke Kvello*¹; ¹SINTEF

2:20 PM

Potentiometric Fluoride Analysis with Improved Analytical Performance: *Thor Anders Aarhaug*¹; *Kalman Nagy*¹; ¹SINTEF

2:40 PM

Investigation of the Mechanism of Mass Transport between the Anode-Bath Interface and the Active Bubble Generating Sites in the Hall-Héroult Cells: *Sandor Poncsak*¹; *Laszlo Kiss*¹; ¹University of Quebec at Chicoutimi

3:00 PM

Depolarized Gas Anodes for Electrowinning of Aluminium from Cryolite-Alumina Melts in a Laboratory Cell: *Geir Martin Haarberg*¹; *Saijun Xiao*¹; *Arne Petter Ratvik*¹; *Tommy Mokkalbost*²; ¹Norwegian University of Science and Technology; ²SINTEF

3:20 PM Break

3:40 PM

Reduction of the Operating Temperature of Aluminium Electrolysis: Low-Temperature Electrolyte: *Alexey Apisarov*¹; *Juan Barreiro*²; *Alexander Dedyukhin*¹; *Leopoldo Galán*²; *Alexander Redkin*¹; *Olga Tkacheva*¹; *Yuri Zaikov*¹; ¹Institute of High Temperature Electrochemistry; ²Alestar

WEDNESDAY PM

4:00 PM

Specific Molecular Features of Potassium-Containing Cryolite Melts: Evgeny Antipov¹; Dmitri Glukhov²; Alexander Gusev³; Veronika Laurinavichute¹; Renat Nazmutdinov²; Dmitri Simakov³; Sergey Vassiliev¹; Tamara Zinkicheva²; *Galina Tsirlina*¹; ¹Moscow University; ²Kazan State Technological University; ³RUSAL ETC

4:20 PM

Aluminum Fluoride Purity Test by Different Techniques: *Hussain Al Halwachi*¹; ¹Aluminium Bahrain (Alba)

4:40 PM

Micro-Raman Spectra Research on NaF-AlF₃-NaCl Melts: *Xianwei Hu*¹; Jingjing Liu¹; Huan Li¹; Bingliang Gao¹; Zhongning Shi¹; Yaxin Yu¹; Zhaowen Wang¹; ¹Northeastern University

Aluminum Reduction Technology: Environment II

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee

Program Organizer: Olivier Martin, Rio Tinto Alcan

Wednesday PM
March 14, 2012

Room: Southern III
Location: Dolphin Resort

Session Chair: Anders Sørhuus, Alstom Norway AS

2:00 PM

GHG Measurement and Inventory for Aluminum Production: *Jerry Marks*¹; Chris Bayliss²; J Marks & Associates; ²International Aluminium Institute

2:20 PM

Optimization and CFD Simulation in the Ventilation of AP60 Reduction Cell Buildings: Edmund Baltuch¹; *Siegmar Baltuch*¹; ¹Air-Therm Inc.

2:40 PM

HEX Retrofit Enables Smelter Capacity Expansion: *Hussain Qassab*¹; Sayed Salah Aqeel Ali Mohd¹; Geir Wedde²; Anders Sorhuus²; ¹Aluminium Bahrain; ²Alstom

3:00 PM

Experimental and Theoretical Study on the Fluidization of Alumina Fluoride Used in the Aluminum Smelter Processes: *Paulo Douglas Vasconcelos*¹; André Luiz Mesquita²; Albras Alumínio Brasileiro S.A.; ²Federal University of Pará

3:20 PM Break

3:40 PM

A Method for Comparing the HF Formation Potential of Aluminas with Different Water Contents: *Camilla Sommerseth*¹; Karen Osen²; Christian Rosenkilde³; Astrid Meyer⁴; Linda Kristiansen³; Thor Aarhaug²; ¹Norwegian University of Science and Technology, NTNU; ²SINTEF; ³Hydro Aluminium; ⁴Norsk Hydro

4:00 PM

Visualising the Sources of Potroom Dust in Aluminium Smelters: *David Wong*¹; Nursiani Tjahyono¹; Margaret Hyland¹; ¹University of Auckland

4:20 PM

Impurity Elements in Raw Gas Ultra-Fines from Aluminum Electrolysis Cells: *Heiko Gaertner*¹; Arne Petter Ratvik¹; Thor Anders Aarhaug²; ¹NTNU; ²SINTEF

Atomistic Effects in Migrating Interphase Interfaces - Recent Progress and Future Study: Roles of Interface on Microstructure Development

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS/ASM: Phase Transformations Committee

Program Organizers: Tadashi Furuhashi, Institute for Materials Research, Tohoku University; Sudarsanam Babu, Ohio State University; Hatem Zurob, McMaster University; Jian-Feng Nie, Monash University; Wen-Zheng Zhang, Tsinghua University; James Howe, University of Virginia

Wednesday PM
March 14, 2012

Room: Europe 3
Location: Dolphin Resort

Session Chairs: Masato Enomoto, Ibaraki University; Annika Borgenstam, Royal Institute of Technology

2:00 PM Invited

Structural Transformations in Binary Alloys with Phase Field Crystals: Michael Greenwood¹; Nana Ofori-Opoku²; Nikolas Provatas²; Joerg Rottler¹; *Chad Sinclair*¹; Mathias Millitzer¹; ¹University of British Columbia; ²McMaster University

2:30 PM Invited

Application of the Diffusion-Multiple Approach in Alloy Development: *Ji-Cheng Zhao*¹; ¹The Ohio State University

3:00 PM

Modelling Growth and Dissolution Kinetics of Grain-Boundary Cementite in Cyclic Carburizing: *Kouji Tanaka*¹; Hideaki Ikehata¹; Hiroyuki Takamiya¹; Hiroyuki Mizuno²; Takeyuki Shimada²; ¹Toyota Central R&D Labs., Inc.; ²Aichi Steel corp.

3:20 PM Break

3:40 PM Invited

Mechanisms for Negative Creep in Nickel Base Superalloys: *J. Tiley*¹; S. Knox²; S Nag³; G. Viswanathan¹; R. Banerjee³; H. Fraser⁴; ¹Air Force Research Laboratory; ²Southwestern Ohio Council for Higher Education/Air Force Research Laboratory; ³Department of Materials Science, University of North Texas; ⁴Department of Materials Science and Engineering, The Ohio State University

4:10 PM Invited

Transient High Temperature Oxidation of a Ni Base Superalloy: *Emmanuelle Marquis*¹; Roger Reed²; ¹University of Michigan; ²University of Birmingham

4:40 PM

Interphase Precipitation of Vanadium Carbide in Low Alloy Steels: *Tadashi Furuhashi*¹; Toshio Murakami²; Goro Miyamoto¹; Naoya Kamikawa¹; ¹Institute for Materials Research, Tohoku University; ²Kobe Steel Ltd.

5:00 PM

The Effect of Molybdenum on Niobium, Titanium Carbonitride Precipitate Stability and Grain Refinement in a High-Temperature Vacuum Carburizing Steel: *Charles Enloe*¹; J.G. Speer¹; K.O. Findley¹; ¹Colorado School of Mines, Advanced Steel Processing and Products Research Center

5:20 PM Concluding Comments Hatem Zurob



TMS 2012

141st Annual Meeting & Exhibition

Biological Materials Science Symposium: Biological and Bio-Inspired Materials IV: Soft Biomaterials

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Nima Rahbar, University of Massachusetts Dartmouth; Candan Tamerler, University of Washington; Po-Yu Chen, University of California, San Diego; Molly Gentleman, Texas A&M University

Wednesday PM Room: Swan 7
March 14, 2012 Location: Swan Resort

Session Chairs: Paul Calvert, University of Massachusetts Dartmouth; Molly Gentleman, Texas A&M University

2:00 PM Invited

Bionic Hydrogel Sensors and Actuators: *Paul Calvert*¹; ¹University of Massachusetts

2:30 PM

The Effect of Polyvinyl Alcohol (PVA) Weight Ratio on Apatite-PVA Composites: *Tugba Basargan*¹; Gulhayat Nasun-Saygili¹; ¹Istanbul Technical University

2:50 PM

Silver Base Nano-Particle Preparation by Ion Bioadsorption of Bacillus Megaterium: *Hongxu Li*¹; Yunchi Guo¹; Chuanqi Jiao¹; ¹University of Science and Technology

3:10 PM

A Comprehensive Study of Hydrogel Material Mechanical and Tribological Properties at Small Scales: *Bo Zhou*¹; Nicholas Randall¹; Drew Griffin¹; Rahul Nair¹; ¹CSM Instruments

3:30 PM

Biomechanics Studies at the Advanced Photon Source Using High-Energy X-rays: *Jonathan Almer*¹; Stuart Stock²; ¹Argonne National Laboratory; ²Northwestern University

3:50 PM Break

4:00 PM Invited

Adhesion of Shells: Applications in Bacteria Aggregation and Transportation in a Porous Medium: *Jiayi Shi*¹; Sinan Muftu¹; April Gu¹; *Kai-Tak Wan*¹; ¹Northeastern University

4:30 PM

Nanoindentation: Potential Diagnostic Method for Cancerous Transformation of Melanocyte: *Ana Paula Benaduce*¹; *Debrupa Lahiri*¹; Lidia Kos¹; Arvind Agarwal¹; ¹Florida International University

4:45 PM

Antimicrobial Efficacy and Degradation Route of Silver-Based Coated Endotracheal Tubes: *Minoo Arzpeima*¹; Gunilla Björling²; Sigbritt Karlsson¹; Ragnhild. E Aune³; ¹Royal Institute of Technology; ²Karolinska Institute; ³Norwegian University of Science and Technology (NTNU)

5:00 PM

Nano-Scale Mechanical Response of the Organic Constituent in Abalone Nacre: *Maria Lopez*¹; Yu-Chen Chan²; Hsien-Wei Chen²; Pao-Sheng Chen²; Po-Yu Chen²; Jenq-Gong Duh²; Joanna McKittrick¹; Marc Meyers¹; ¹UCSD; ²National Tsing Hua University

5:15 PM

Cell Toxicity of Go/Rgo: Function of Size and Oxygenated Functional Group Density: *Soumen Das*¹; Sanjay Singh¹; Virendra Singh¹; Daeha Jung¹; Janet Dowding¹; Rameech McCormack¹; Lei Zhai¹; Saiful I. Khondaker¹; William Self¹; Sudipta Seal¹; ¹University of Central Florida

Bulk Metallic Glasses IX: Simulation and Modeling

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

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

Wednesday PM Room: Swan 6
March 14, 2012 Location: Swan Resort

Session Chairs: Mo Li, Georgia Institute of Tech; Yunfeng Shi, Rensselaer Polytechnic Institute

2:00 PM Invited

Packing, Cluster Formation and Their Roles in Physical and Mechanical Property of Metallic Glasses: *Mo Li*¹; Qikai Li²; ¹Georgia Institute of Tech; ²Tsinghua University

2:20 PM Invited

First-Principles Tensile and Compression Experiments on a Model Metallic Glass: *Wai-Yim Ching*¹; Yungfeng Shi²; Despina Louca³; Gongyao Wang⁴; Peter Liaw⁴; ¹University of Missouri-Kansas City; ²Rensselaer Polytechnic Institute; ³University of Virginia; ⁴University of Tennessee

2:40 PM Invited

Simple Analytic Models for Plastic Deformation and Slip Avalanches: From Crystals to Amorphous Materials to Granular Materials: *Karin Dahmen*¹; Yehuda Ben-Zion²; Jonathan Uhl¹; Georgios Tsekenis¹; ¹University of Illinois at Urbana Champaign; ²University of Southern California

3:00 PM

Phase-Field Simulation Study of Nucleation and Propagation of Shear Bands in Bulk Metallic Glasses with Stress-Induced Precipitation of Martensitic Nanocrystals: *Alireza Zakeri*¹; Fadi Abdeljawad¹; Mikko Haataja¹; ¹Princeton University

3:10 PM Invited

Correlations during Plastic Flow in Model Metallic Glasses: *Craig Maloney*¹; ¹Carnegie Mellon University / Civil & Environmental Engineering

3:30 PM Invited

Computer Simulation of the Structure of Zr-Based Amorphous Alloys: *Mikhail Mendeleev*¹; ¹Ames Laboratory

3:50 PM Break

4:05 PM Invited

Simulating the Effect of Poisson Ratio on Metallic Glasses: *James Morris*¹; ¹Oak Ridge National Laboratory

4:25 PM

Analysis of Glass-Forming Ability through Atomistic Modeling: *Logan Ward*¹; Katharine Flores¹; Wolfgang Windl¹; ¹The Ohio State University

4:35 PM Invited

Bauschinger Effect in Metallic Glass Nanowires under Cyclic Loading: *Yunfeng Shi*¹; Jian Luo¹; Louca Despina²; Gongyao Wang³; Peter Liaw³; ¹Rensselaer Polytechnic Institute; ²University of Virginia; ³The University of Tennessee

4:55 PM

Modeling the Intrinsic Shear Strength of Metallic Glass: *Yongqiang Cheng*¹; Evan Ma¹; ¹Johns Hopkins University

5:05 PM Invited

Atomistic Anisotropy in Deformed Metallic Glasses Studied via Molecular Dynamics Simulations: *Yunche Wang*¹; Chun-Yi Wu¹; Peter Liaw²; ¹National Cheng Kung University; ²University of Tennessee

5:25 PM Invited

Structures, Phase Transformations and Elastic Properties of High-Entropy Al_xCoCrCuFeNi Alloys: Ab Initio Molecular Dynamics Simulation: *Michael Gao*¹; Louis Santodonato²; Peter Liaw²; ¹National Energy Technology Lab; ²University of Tennessee

5:45 PM

Quasi-Phase-Transition Model of Shear Bands in Metallic Glasses: *Zengqian Liu*¹; Ran Li¹; Gang Wang²; Sujun Wu¹; Xuyang Lu¹; Tao Zhang¹; ¹Beihang University; ²Shanghai University

Cast Shop for Aluminum Production: Direct-Chill Casting and Microstructures

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Trond Furu, Hydro

Wednesday PM
March 14, 2012

Room: Northern A4
Location: Dolphin Resort

Session Chairs: Pierre Le Brun, Constellium CRV; Trond Furu, Hydro

2:00 PM

Improving Strip Surface Quality Using Different Casting Atmospheres for the Horizontal Single Belt Strip Casting (HSBC) Process: *Donghui Li*¹; Mihaela Isac¹; Roderick Guthrie¹; ¹McGill Metals Processing Centre

2:20 PM

Influence of Casting Direct Chill Casting Process Variables on Surface Quality of Aluminum Alloy Sheet Ingots: *Mostafa El-Bealy*¹; ¹Ain Shams University, (CC)

2:40 PM

Square Rolling Slabs from Start of Casting - the Elimination of Butt Swell: *Arild Hakonsen*¹; Harald Næss²; Idar Steen¹; Terje Iveland³; ¹Hycast AS; ²Hydro Aluminium; ³Hydro Aluminium

3:00 PM

Residual Stresses in As-Cast Billets: Neutron Diffraction Measurement and Thermomechanical Modeling: *Jean-Marie Drezet*¹; Thilo Pirling²; Christophe Jaquero³; ¹Ecole Polytechnique Federale Lausanne; ²Institut Laue Langevin; ³Constellium Valais SA

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

The Deepwater Horizon Explosion and Correlations to the Aluminium Casthouse: *Alex Lowery*¹; Terry Bateman²; Joe Roberts³; ¹Wise Chem LLC; ²Pyrotek Pyt Ltd.; ³Pyrotek Inc

4:00 PM

Deformation Behaviors of Pure Al and Al-4.5 Mass%Cu Alloy in Semi Solid State: *Nobuhito Sakaguchi*¹; ¹Sumitomo Light Metal Industries,LTD.

4:20 PM

Chemical Additions to Reduce Hot Tearing in the Cast House: Lisa Sweet¹; John Taylor¹; *Mark Easton*¹; Malcolm Couper²; Nick Parson³; ¹CAST Co-operative Research Centre; ²ARC Centre of Excellence of Design in Light Metals; ³Rio Tinto Alcan

4:40 PM Break

CFD Modeling and Simulation in Materials Processing: Electromagnetic and Ultrasonic Processing of Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
Program Organizers: Laurentiu Nastac, The University of Alabama; Lifeng Zhang, Missouri University of Science and Technology; Brian Thomas, University of Illinois at Urbana-Champaign; Adrian Sabau, Oak Ridge National Lab ; Nagy El-Kaddah, The University of Alabama; Adam Powell, Metal Oxygen Separation Technologies, Inc.; Hervé Combeau, Institut Jean Lamour

Wednesday PM
March 14, 2012

Room: Asia 4
Location: Dolphin Resort

Session Chairs: Andre Thess, TU Ilmenau; Valdis Bojarevics, University of Greenwich

2:00 PM Keynote

Modeling Magnetically Excited and Magnetically Damped Liquid Metal Flow: *Valdis Bojarevics*¹; Koulis Pericleous¹; ¹University of Greenwich

2:30 PM Invited

Numerical Simulation of Liquid Metal Flows under the Influence of Magnetic Fields: *Andre Thess*¹; Thomas Boeck¹; Christian Karcher¹; Joerg Schumacher¹; Dmitry Krasnov¹; Gautam Pulugundla¹; Saskia Tympel¹; Vitaly Minchenya¹; Shuai Dong¹; ¹TU Ilmenau

2:55 PM Invited

Numerical Analysis of the Influence of Melting and Application of Electromagnetic Stirring Prior to Solidification on Macrosegregation Formation during Casting of a Binary Alloy: *Knut Omdal Tveito*¹; Mohammed M'Hamdi²; Hervé Combeau³; Miha Založnik⁴; Xiaodong Wang⁵; Bachir Saadi⁵; Yves Fautrelle⁵; ¹Norwegian University of Science and Technology; ²SINTEF Materials and Chemistry; ³Institut Jean Lamour, Departement SI2M, CNRS – Nancy-Université – UPV-Metz, Ecole des Mines de Nancy; ⁴Institut Jean Lamour, Departement SI2M, CNRS – Nancy-Université – UPV-Metz, Ecole des Mines de Nancy; ⁵SIMAP – CNRS – INPG - Université Joseph Fourier

3:20 PM Invited

Multiscale Modeling of Ingot Solidification Structure Controlled by Electromagnetic and Ultrasonic Stirring Technologies: *Laurentiu Nastac*¹; ¹The University of Alabama

3:45 PM Break**4:05 PM**

Evolution of the Velocity Field during Solidification in an Electromagnetically Stirred Melt: Gregory Poole¹; *Nagy El-Kaddah*¹; ¹The University of Alabama



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4:30 PM

Modeling the Case Hardening of Crankshafts: *Tirutani Kamal¹; Suresh Sundarraj¹; ¹General Motors*

4:50 PM

Study of De-Agglomerations Ceramic Nano Particles in the Aluminium Melt under Cavitation Phenomenon for Processing of Metal Matrix Nanocomposites: *Payodhar Padhi¹; Pragyan Mohanty²; ¹Konark Institute of Science & Technology; ²ITER*

5:10 PM

Fundamental Study on Behavior of Inclusion in Electromagnetic Swirling Flow in Immersion Nozzle in Continuous Casting Process: *Su Zhijian¹; Li Dewei¹; Yang Ying²; Nakajima Keiji²; Jönsson Pär²; Marukawa Katsukiyo³; He Jicheng¹; ¹Northeastern University; ²Royal Institute of Technology (KTH); ³Sumitomo Metal Industries, Ltd.*

Characterization of Minerals, Metals, and Materials: Characterization of Energy, Electronic and Optical Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jiann-Yang Hwang, Michigan Technological University; Sergio Montero, State University of North Rio De Janeiro; Chenguang Bai, Chongqing University; John Carpenter, US Department of Energy; Donato Firrao, Politecnico di Torino; Byoung-Gon Kim, Korea Institute of Geoscience & Mineral Resources; Mingdong Cai, Schlumberger

Wednesday PM
March 14, 2012

Room: Asia 2
Location: Dolphin Resort

Session Chairs: Sergio Monteiro, State University of North Rio de Janeiro; Zheng Zhang, Michigan Technological University

2:00 PM

Influence of La₂O₃ Additive Content on the Phase Stability, Sintering and Microstructure of 8 MOL% Y₂O₃ Stabilized Zirconia (8YSZ) Ceramic Used for Solid Oxide Fuel Cell Applications: *Suleyman Tekeli¹; Bulent Aktas²; Serdar Salman³; ¹Gazi University; ²Harran University; ³Marmara University*

2:15 PM

Development and Characterization of Carbonaceous Materials Incorporated with Metal (Ti, V and Zn)-Organic Compounds for Hydrogen Storage: *Mala Nath¹; Asheesh Kumar¹; Arjit Mallick¹; ¹Indian Institute of Technology Roorkee*

2:30 PM

Characterization of Nickel Oxide Nanoparticles for Hydrogen Adsorption with External Electric Field: *Zheng Zhang¹; Xiang Sun¹; Zhiwei Peng¹; Jiann-Yang Hwang¹; ¹MTU*

2:45 PM

Ag /Diamond Composite Shims for High-Performance Thermal Management: *Jason Nadler¹; Lee Bannister¹; ¹GTRI*

3:00 PM

Nanocrystalline CdS Thin Films Prepared by Vacuum Evaporation: *Shadia Ikhmayies¹; ¹Al Isra University*

3:15 PM

Structure-Property Correlation of Pb(Ni_{0.33}Nb_{0.67})O₃-(1-x)Pb(Zr_{0.31}Ti_{0.69})O₃ Based Relaxor-Ferroelectric Ceramics Synthesized Via Columbite Precursor Method: *Bandi Mallesham¹; T. V. Jayaraman²; A. R. James³; Dibakar Das¹; ¹University of Hyderabad; ²University of Nebraska; ³Defence Metallurgical Research Laboratory*

3:30 PM

Evolution of High-Energy Electron Beam Irradiation Effects on Zeolite Supported Catalyst: Metal Nanoprecipitation: *Kai Song¹; Jinsong Wu¹; Dana Sauter¹; Vinayak Dravid¹; Peter Stair¹; ¹Northwestern University*

3:45 PM

The Characteristics of Optical Recording Media Affected by The Accelerating Aging Test: *Der-Ray Huang¹; ¹INDHU*

4:00 PM

A Comparison between the Properties of Spray-Pyrolyzed SnO₂:F/CdS:In Structures Prepared by Using NH₄F and HF as a Source of Fluorine: *Shadia Ikhmayies¹; Riyad Ahmad-Bitar²; ¹Al Isra University; ²University of Jordan*

4:15 PM

Transmission Electron Microscopy Study on Interfaces in Cu/CuZr Multi-layer Thin Films: *Ying Li¹; Robert Dickerson¹; Amit Misra¹; ¹Los Alamos National Laboratory*

4:30 PM

Characterization and Preparation of Anti-Reflection Coatings in the RANGE of 3-5 μm for Si Optical Window: *Khurram Iqbal¹; Asghari Maqsood¹; ¹National University of Sciences and Technology*

4:45 PM

Investigation of Room Temperature Dislocation Mobility in Metal Diborides (ZrB₂) Using Nano and Micro Indentation: *Ghatu Subhash¹; Dipankar Ghosh¹; ¹University of Florida*

Computational Thermodynamics and Kinetics: Cluster Expansion, Kinetic Monte Carlo, and First-principles

Sponsored by: The Minerals, Metals and Materials Society, 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, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Phase Transformations Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Zi-Kui Liu, The Pennsylvania State University; Mark Asta, University of California, Berkeley; James Warren, The National Institute of Standards and Technology; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yu Wang, Michigan Tech

Wednesday PM
March 14, 2012

Room: Australia 3
Location: Dolphin Resort

Session Chairs: Brent Fultz, Caltech; Axel van de Walle, Brown University

2:00 PM Invited

Cluster Expansion Methods - Progress and Outlook: *Axel van de Walle¹; ¹Brown University*

2:25 PM

Kinetic Monte Carlo Simulations of Diffusion-Limited Nucleation: *Yang Hao Lau¹; Ramanarayan Hariharaputran¹; David Wu¹; ¹Institute of High Performance Computing*

2:40 PM

Kinetics of Tellurium Precipitation in CdTe-Based Materials: *Vincenzo Lordi¹; ¹Lawrence Livermore National Lab*

WEDNESDAY PM

2:55 PM

Influence of Misfit Stresses on Sputter-Induced Patterns on Alloy Thin Films: *Bharathi Srinivasan*¹; Ramanarayan Hariharaputran²; Yong-Wei Zhang¹; ¹Institute of High Performance Computing, Singapore; ²Institute of High Performance Computing

3:10 PM Break

3:40 PM

Continuous Displacement Cluster Variation Method and Its Applications: *Tetsuo Mohri*¹; ¹Hokkaido University

3:55 PM

Positive Vibrational Entropy of Chemical Ordering in FeV and Its Electronic Origin: *Brent Fultz*¹; Jorge Munoz¹; Lisa Mauger¹; Chen Li¹; Matthew Lucas²; Olivier Delaire³; Douglas Abernathy³; Matthew Stone³; ¹California Institute of Technology; ²Wright-Patterson AFB; ³Oak Ridge National Laboratory

4:10 PM

Ab Initio Study of Advanced Metallic Nuclear Fuels for Fast Breeder Reactors: *Alexander Landa*¹; Per Söderlind¹; Patrice Turchi¹; Andrei Ruban²; Levente Vitos²; ¹Lawrence Livermore National Laboratory; ²Royal Institute of Technology

4:25 PM

Ordering of Oxygen and Vacancies in Hexagonal Closest Packed Zr and Hf: ZrO_x and HfO_x (0 ≤ x ≤ 1/2): *Benjamin Burton*¹; Axel van de Walle²; ¹NIST; ²California Institute of Technology

4:40 PM

DFT Study of Initial Oxidation State on TiN Step Surfaces: *Minki Hong*¹; Simon Phillpot¹; Susan Sinnott¹; ¹University of Florida

4:55 PM

Generalized Cluster Expansion of III-V Semiconductor Alloys: *Gregory Pomrehn*¹; Axel van de Walle²; ¹California Institute of Technology; ²Brown University

Defects and Properties of Cast Metals: Novel Processes and Applications

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Solidification Committee

Program Organizers: Mark Jolly, University of Birmingham; Brian Thomas, University of Illinois at Urbana-Champaign; Carl Reilly, University of British Columbia

Wednesday PM
March 14, 2012

Room: Oceanic 4
Location: Dolphin Resort

Session Chairs: Peter Lee, University of Manchester; Mark Jolly, University of Birmingham

2:00 PM

Flux Entrapment Defects in Electroslag Remelting of High Ti, Low Al Nickel Based Superalloys: *Jonathan Busch*¹; Jack deBarbadillo²; Matthew Krane¹; ¹Purdue University; ²Special Metals Corporation

2:25 PM

Defect Control on Al Castings for Excellent Quality and Improved Performances through Novel Rheocasting Processes: *Mario Rosso*¹; Ildiko Peter¹; ¹Politecnico di Torino

2:50 PM

Defect Elimination in Cast Al Components via Friction Stir Processing: *Ning Sun*¹; Diran Apelian¹; ¹Worcester Polytechnic Institute

3:15 PM Break

3:40 PM

Quality Improvement of Aluminium Alloy Castings by application of a New Casting Facility instead of a Conventional Investment Casting Process: *Xiaojun Dai*¹; Mark Jolly¹; Bin Xu Zeng¹; ¹University of Birmingham

4:05 PM

Ribbon-Substrate Adhesion and Catastrophic Sticking in the Planar-Flow Melt Spinning of Metals: *Anthony Altieri*¹; Eric Theisen²; Paul Steen¹; ¹Cornell University; ²Metglas, Inc

4:30 PM Concluding Comments

Deformation, Damage, and Fracture of Light Metals and Alloys: Session V

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Light Metals Division, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Qizhen Li, University of Nevada, Reno; Fuqian Yang, Univ. of Kentucky; Ke An, Oak Ridge National Laboratory

Wednesday PM
March 14, 2012

Room: Northern A2
Location: Dolphin Resort

Session Chairs: Qizhen Li, University of Nevada, Reno; Wen-Ming Chien, University of Nevada, Reno

2:00 PM Invited

Study of the High-Performance Super-Light Mg-Li Alloys and Heat-Resistant Mg-RE Alloys: *Milin Zhang*¹; Ruizhi Wu¹; Jinghui Zhang¹; Fengchun Jiang¹; ¹Harbin Engineering University

2:30 PM

Effect of Stacking Fault Energy and Solute Size on the Rare Earth Texture Evolution and Deformation Behavior of Magnesium Alloys: *Zachary Bryan*¹; Ryan Hooper¹; Michele Manuel¹; ¹University of Florida

2:45 PM

Strengthening Mechanisms in Solution-Annealed Ni-rich NiTi Alloys: *Billy Hornbuckle*¹; Taisuke Sasaki²; Ron Noebe³; Glen Bigelow³; Mark Weaver¹; Greg Thompson¹; ¹The University of Alabama; ²National Institute for Materials Science; ³NASA Glenn Research Center

3:00 PM Break

3:20 PM

Twinning Mechanisms in Hexagonal Close-Packed Metals: *Bin Li*¹; Xiyan Zhang²; ¹Center for Advanced Vehicular Systems; ²Chongqing University

3:35 PM

Alloy Development and High Temperature Deformation of TiAlNbCrMo Alloys: *Glenn Bean*¹; Michele Manuel¹; ¹University of Florida

3:50 PM

Role of Substitution Elements on Twinning Nucleation Mechanism in Magnesium: *Mehul Bhatia*¹; Kiran Solanki¹; Amitava Moitra²; Mark Tschopp³; ¹SEMTE; ²Department of Chemical Engineering and Materials Science and Engineering; ³CAVS - Center for Advanced Vehicular System

4:05 PM

Effect of Aging Treatment on Fatigue Behavior of an Al-Cu-Mg-Ag Alloy: *Micheal Burba*¹; Michael Caton²; Sushant Jha³; Christopher Szczepanski²; ¹University of Dayton; ²US Air Force Research Laboratory; ³Universal Technology Corporation



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Electrode Technology for Aluminium Production: Characterization of Cathode Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee

Program Organizer: Morten Sorlie, Alcoa Norway

Wednesday PM
March 14, 2012

Room: Americas Seminar
Location: Dolphin Resort

Session Chair: Egil Skybakmoen, SINTEF

2:00 PM

Spent Potlining: an Update: *Rudolf Pawlek*¹; ¹TS+C

2:25 PM

Analysis of Porous Structures of Graphitic Cathode Materials and the Correlation to Penetrated Sodium: *Xiang Li*¹; *Jilai Xue*¹; *Jun Zhu*¹; *Qingcheng Zhang*¹; ¹University of Science and Technology Beijing

2:50 PM

Characterization of Carbon Cathode Materials by X-Ray Microtomography: *Martin Brassard*¹; *Martin Lebeuf*¹; *Alexandre Blais*²; *Loig Rivoaland*²; *Martin Désilets*¹; *Gervais Soucy*¹; ¹Université de Sherbrooke; ²Rio Tinto Alcan

3:15 PM

New Observations in Creep Behavior of Ramming Paste in Aluminium Electrolysis Cell: *Sakineh Orangi*¹; *Donald Picard*¹; *Houshang Alamdari*¹; *Donald Ziegler*²; *Mario Fafard*¹; ¹NSERC/Alcoa Industrial Research Chair MACE3 and Aluminium Research Centre-REGAL, Laval University; ²Alcoa Canada

3:40 PM Break

3:55 PM

Wetting of KF-AIF₃-Based Melts on Graphite Cathode Materials for Aluminum Electrolysis: *Yanan Zhang*¹; *Jilai Xue*¹; *Jun Zhu*¹; *Xiang Li*¹; ¹University of Science and Technology Beijing

4:20 PM

Fundamentals of Aluminum Carbide Formation: *Bronislav Novak*¹; *Kati Tschöpe*¹; *Arne Petter Ratvik*¹; *Tor Grande*¹; ¹Norwegian University of Science and Technology

4:45 PM

Investigation of the Cathode Wear Mechanism in a Laboratory Test Cell: *Kati Tschöpe*¹; *Anne Støre*²; *Stein Rørvik*²; *Egil Skybakmoen*²; *Tor Grande*¹; *Arne Ratvik*¹; ¹NTNU; ²SINTEF Materials and Chemistry

5:10 PM

Study on Graphitization of Cathode Carbon Blocks for Aluminum Electrolysis: *Gao Feng*¹; ¹Northeastern University

Energy Nanomaterials: Thermoelectrics and Thermal Transport

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Reza Shahbazian-Yassar, Michigan Technological University; Ming Au, Savannah River National Laboratory; Meyya Meyyappan, NASA Ames Research Center

Wednesday PM
March 14, 2012

Room: Swan 3
Location: Swan Resort

Session Chairs: Meyya Meyyappan, NASA Ames Research Center; Reza Shahbazian Yassar, Michigan Technological University

2:00 PM

Ab-Initio Thermal Conductivity for Thermoelectric Nanostructured Materials: *Derek Stewart*¹; *Anupam Kundu*²; *Natalio Mingo*²; *Alistair Ward*³; *David Broido*³; ¹Cornell University; ²CEA-Grenoble; ³Boston College

2:25 PM

Characterization of Nanostructured Thermoelectric Materials Using Electron Backscattered Diffraction: *Matt Nowell*¹; ¹EDAX-TSL

2:50 PM

Study to Bi₂Te₃-Based Thermoelectric Nanocomposite Added Silver Nanoparticles by Metal-Organic Decomposition: *Hsin-Hsien Yeh*¹; *Chiung-Hsiung Chen*²; *Hong-Ching Lin*²; *Ming-Wei Lai*²; *Chien-Neng Liao*¹; ¹National Tsing Hua University; ²ITRI

3:15 PM

Enhanced Performances of Micro-Thermoelectric Devices Integrating Layered A₂Te₃ (A= Sb, Bi) Films: *Tanning Tan*¹; ¹Beihang University

3:30 PM Break

4:00 PM Invited

Thermal Transport in Nanomaterials for Energy Applications: *Xinwei Wang*¹; ¹Iowa State University

4:30 PM

Effects of Surface Faceting and Twinning on Thermal Transport Characteristics of Silicon Nanowires: *Frederic Sansoz*¹; ¹University of Vermont

4:55 PM

Mechanical and Thermal Energy Transport in Biological and Biologically Inspired Nanostructures: *Markus Buehler*¹; ¹Massachusetts Institute of Technology

WEDNESDAY PM

Energy Technologies and Carbon Dioxide Management: CO₂ Management and Utilization

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee

Program Organizers: Maria Salazar-Villalpando, DOE/National Energy Technology Laboratory; Neale Neelameggham, IND LLC*; Donna Guillen, Idaho National Laboratory; Subodh Das, Phinix, LLC; Ramana Reddy, Univ of Alabama; Animesh Jha, Univ of Leeds; Soobhankar "Sib" Pati, Metal Oxygen Separation Technologies (MOxST); Mark Jolly, Univ of Birmingham; Lakshmanan Vaikuntam, Process Research ORTECH Inc

Wednesday PM
March 14, 2012

Room: Europe 8
Location: Dolphin Resort

Session Chairs: Maria Salazar-Villalpando, DOE/National Energy Technology Laboratory; Neale Neelameggham, IND LLC; Mahesh Jha, DOE; Jung-Kun Lee, University of Pittsburgh

2:00 PM Introductory Comments

2:05 PM Keynote

Meeting the Materials Challenges to Enable Clean Coal Technologies: *Bryan Morreale*¹; *Cynthia Powell*¹; ¹US DOE National Energy Technology Laboratory

2:25 PM Keynote

Liquid Fuels from CO₂, Water, and Solar Energy: *Aldo Steinfeld*¹; ¹ETH Zurich

2:45 PM

Solar Activated Photocatalytic Conversion of CO₂ and Water to Fuels by TiO₂-Based Nanocomposites: *Qianyi Zhang*¹; *Lianjun Liu*¹; *Ying Li*¹; ¹University of Wisconsin-Milwaukee

3:00 PM

Photocatalytic Efficacy of 1-Dimensional Nanocomposite Electrode: *Bo Ding*¹; *Jung-Kun Lee*¹; ¹University of Pittsburgh

3:15 PM

Electro-Catalytic Conversion of Carbon Dioxide into Hydrocarbon Fuels: A Theoretical Study of Selectivity and Efficiency of Copper Catalysis: *Tao Liang*¹; *Yu-Ting Cheng*¹; *Simon Phillpot*¹; *Susan Sinnott*¹; ¹University of Florida

3:30 PM Break

3:35 PM

Reduction of Energy Consumption and GHGs Emission in Investment Casting Process by Application of a New Casting Method: *Xiaojuan Dai*¹; *Mark Jolly*¹; *Binxu Zeng*¹; ¹University of Birmingham

3:50 PM

Bauxite Residue Neutralization and Carbon Sequestration from Flue Gas: *Luis Venancio*¹; *Emanuel Macedo*²; *José Antonio Souza*²; *Fernando Botelho*²; *Otacílio Dias*²; ¹Federal University of Para; ²Federal University of Para

4:05 PM

50% Reduction of Energy and CO₂ Emission in Metallurgical Furnaces by Burners: *Michael Potesser*¹; *Davor Spoljaric*¹; *Burkhardt Holleis*¹; *Martin Demuth*¹; ¹Messer Group

4:20 PM

CO₂ Removal from Industrial Off-Gas Streams by Fluidized Bed Carbonation: *Koullis Pericleous*¹; *Mazaher Molaei*²; *Mayur Patel*²; ¹University of Greenwich; ²University of Greenwich

4:35 PM

A Hydro-Mechanical Model and Analytical Solutions for Geomechanical Modeling of Carbon Dioxide Geological Sequestration: *Zhijie Xu*¹; *Yilin Fang*¹; *Timothy Scheibe*¹; *Alain Bonneville*¹; ¹Pacific Northwest National Laboratory (PNNL)

Fatigue and Corrosion Damage in Metallic Materials: Fundamentals, Modeling and Prevention: Materials Corrosion and Prevention

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum; Peter Liaw, University of Tennessee

Wednesday PM
March 14, 2012

Room: Oceanic 6
Location: Dolphin Resort

Session Chairs: Gary Harlow, Lehigh University; Richard Ricker, NIST

2:00 PM Invited

Characterization of Constituent Particles in 7075-T6 Aluminum Alloy: *D Gary Harlow*¹; ¹Lehigh University

2:20 PM Invited

Effect of Hydrogen on the Localized Corrosion of Stainless Steels: *Lijie Qiao*¹; ¹University of Science and Technology Beijing

2:40 PM Invited

Water-Induced Damage of Subsurface Layer in AA 2037 Al Alloy Probed by a Slow Positron Beam: *Yichu Wu*¹; *Peihai Li*¹; *Tongguang Zhai*²; *Paul Coleman*³; ¹Wuhan University; ²University of Kentucky; ³University of Bath

3:00 PM

Investigation on Corrosion Behavior of Ni-Based Alloys in Molten Fluoride Salt Using Synchrotron Radiation Technique: *Min Liu*¹; *Yanling Lu*¹; *Yanyan Jia*¹; *Junyi Zheng*¹; *Zhijun Li*¹; *Yang Zou*¹; *Xiaohan Yu*¹; *Xingtai Zhou*¹; ¹Shanghai Institute of Applied Physics, Chinese Academy of Sciences

3:20 PM

Electrochemical Measurement Methods for Evaluation of the Effects of Hydrogen on the Mechanical Properties of Metals: *Richard Ricker*¹; ¹NIST

3:40 PM Break

3:45 PM

Evaluation of Residual Stresses by Sen θ Method and Its Relationship with the Corrosion Resistance of ER NiCrMo-4 Weld Overlays on C-Mn Steel Pipelines: *Raphael Henrique de Melo*¹; *Theophilo Maciel*¹; *Marcos da Silva*¹; *Valmir Batista*¹; *Marcos Antonio dos Santos*¹; ¹Federal University of Campina Grande

4:05 PM

Influence of Non-Metallic Inclusions on Pitting Corrosion Resistance of Cr-Ni-Mn Austenitic Stainless Steel: *Alexander Ramirez*²; *Adriana Murcia Santanilla*¹; *Neusa Alonso-Falleiros*¹; ¹University of São Paulo

4:25 PM

A Study on the Effect of Applied Potentials on Tress Corrosion Cracking of X70 Pipeline Steel in High pH Carbonate/Bicarbonate by EIS: *Ayda Shahriari*¹; *Taghi Shahrabi*¹; *Aliakbar Oskui*¹; ¹Tarbiat Modares University



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4:45 PM

Comparative Study of the Influence of Welding Parameters on the Characteristics of Stainless Steel Weld Overlays Applied by FCAW and SAW Process: Raphael Henrique de Melo¹; *Theophilo Maciel*¹; ¹Federal University of Campina Grande)

5:05 PM

Effect of Conversion Coatings on SCC Behavior of Pipeline Steels: *Aliakbar Oskuie*¹; Taghi Shahrabi¹; ¹Tarbiat Modares University

Federal Funding Workshop: Panel Discussion

Sponsored by: The Minerals, Metals and Materials Society, TMS Public & Governmental Affairs Committee
Program Organizers: Robert Shull, National Institute of Standards and Technology; Jud Ready, Georgia Institute of Technology

Wednesday PM
March 14, 2012

Room: Northern C
Location: Dolphin Resort

4:00 PM Panel Discussion with Panelists:

Looking for Transformative Approaches for the Materials Genome Initiative: *Diana Farkas*, Program Director, Condensed Matter and Materials Theory, Division of Materials Research, National Science Foundation

Basic Research Challenge in Materials: *Julie Christodoulou*, Director, Naval Materials Division, Office of Naval Research

New Efforts on Computational Materials: *Diana Bauer*, Director of the Office of Economic Analysis, U.S. Department of Energy

Advancing Superalloys: Michael Caton, Senior Materials Research Engineer, Materials & Manufacturing Directorate, Air Force Research Laboratory

5:15-6:00 PM: Networking Reception with the Panelists
Sponsored by the Georgia Institute of Technology

From Macro to Nano, Understanding Mechanical Behavior across Length Scales: A Structural Materials Division Symposium in Honor of Robert Ritchie: Deformation and Fracture

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Biomaterials Committee
Program Organizers: Jamie Kruzic, Oregon State University; Brad Boyce, Sandia National Labs; Reinhold Dauskardt, Stanford University

Wednesday PM
March 14, 2012

Room: Mockingbird 1
Location: Swan Resort

Session Chairs: Philip Withers, The University of Manchester; Brad Boyce, Sandia National Laboratories

2:00 PM Introductory Comments

2:05 PM Keynote

Fracture Mechanics by 3D Crack-Tip Microscopy: *Philip Withers*¹; ¹University of Manchester

2:45 PM

Fracture Behavior of Tungsten: *Bernd Gludovatz*¹; Stefan Wurster²; Andreas Hoffmann³; Reinhard Pippan²; ¹Lawrence Berkeley National Laboratory; ²Erich Schmid Institute of Materials Science, Austrian Academy of Sciences; ³Plansee SE

3:00 PM

Grain Boundary Cracking in Sn-Rich Pb-free Solders: *J. Shang*¹; ¹University of Illinois

3:15 PM

Tensile Deformation of Quenched and Partitioned Steel - A Third Generation High Strength Steel: Jason Coryell¹; *Josh Campbell*²; Vesna Savic¹; John Bradley²; Sushil Mishra¹; Shashank Tiwari¹; Louis Hector Jr²; ¹General Motors; ²GM R&D Center

3:30 PM

The Influence of Microstructure and Texture on Strain Localization in Thin Stainless Steel Sheet: Eric Buchovecky¹; *Louis Hector Jr*²; Siguang Xu²; John Bradley²; Sushil Mishra²; Allan Bower¹; ¹Brown University; ²General Motors

3:45 PM Break

4:00 PM

Microscale Testing of Fracture Toughness in Graded Pt-Ni-Al Bond Coats on Superalloys: Jaya Nagamani¹; *Vikram Jayaram*¹; Sanjay Biswas¹; ¹Indian Institute of Science

4:15 PM

Deformation Response of Cold-Drawn and Annealed MP35N Wire: *M.J.N.V. Prasad*¹; Sharvan Kumar¹; ¹Brown University

4:30 PM

Mechanical Behavior of Copper Single Crystal in the Presence of Point Defects: *Iman Salehinia*¹; David Bahr¹; ¹WSU

WEDNESDAY PM

4:45 PM

Effect of Grain Boundary Character on Strain Localization and Grain Boundary Sliding during Creep Deformation of Nickel-Bases Superalloys: *Jennifer Carter*¹; Michael Uchic²; Michael Mills¹; ¹The Ohio State University; ²Air Force Research Laboratory, Materials & Manufacturing Directorate

5:00 PM

Comparison of Deformation Mechanisms for Constant Strain Rate and Creep Testing of a Ni-Based Superalloy: *Hallee Deutchman*¹; Michael Mills¹; ¹The Ohio State University

International Smelting Technology Symposium (Incorporating the 6th Advances in Sulfide Smelting Symposium): Pyrometallurgical Process Modeling, Control & Instrumentation

Sponsored by: The Minerals, Metals and Materials Society, The Metallurgy and Materials Society of CIM, TMS Extraction and Processing Division, TMS: Pyrometallurgy Committee
Program Organizers: Jerome Downey, Montana Tech of the Univ of Montana; Thomas Battle, Midrex Technologies, Inc.; Jesse White, Elkem Solar Research

Wednesday PM
March 14, 2012

Room: Northern A3
Location: Dolphin Resort

Session Chair: To Be Announced

2:00 PM

Comparison of Classical Tools and Modern Finite Element Modeling in the Electrical Design of Slag Resistance Furnaces: *Mark Kennedy*¹; Melina Garcia²; Finn Olesen³; ¹Norwegian University of Science and Technology; ²Elkem AS; ³Elkem Bjølvefossen AS

2:25 PM

CFD Modelling of Combustion Behaviour in Slag Fuming Furnaces: Md Huda¹; Jamal Naser¹; *Geoffrey Brooks*¹; M. Reuter²; Robert Matuszewicz²; ¹Swinburne University of Technology; ²Outotec Limited

2:50 PM

Modeling as a Tool for Scale-Up of an Iron Smelt-Reduction Process: *Mark Schwarzl*¹; Mark Davis²; ¹CSIRO; ²Hismelt Corp

3:15 PM

Validating Temperature Measurements in Pyrometallurgical Applications – A Case Study: *Håvard Molnås*¹; Joalet Steenkamp²; Merete Tangstad¹; ¹NTNU; ²University of Pretoria

3:40 PM Break

4:00 PM

Electric Slag Furnace Dimensioning: *Mark Kennedy*¹; ¹Norwegian University of Science and Technology

4:25 PM

Physical Modeling Study on Mixing Phenomena in a C-H₂ Smelting Reduction Furnace Bath with Asymmetric Side Blowing Process: *Jinyin Xie*¹; Jieyu Zhang¹; Kongfang Feng¹; Jixu Wang¹; Fei Ruan¹; Zhiyu Liu¹; Shaobo Zheng¹; Xin Hong¹; ¹Shanghai University

4:50 PM

Successful Application of Model Based Predictive Control for Production and Thermal Efficiency Optimization of High Temperature Melters: Erik Muijsenberg¹; ¹Elkem Technology

Magnesium Technology 2012: Corrosion and Coating

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht; Neale Neelameggham, U.S. Magnesium

Wednesday PM
March 14, 2012

Room: Southern IV
Location: Dolphin Resort

Session Chairs: Guang-Ling Song, GM Global Research & Development; Michelle Manuel, University of Florida

2:00 PM

“Electroless” E-Coating for Mg Alloys: *Guang-Ling Song*¹; ¹GM Global Research & Development

2:20 PM

The Influence of Galvanic Current on Cerium-Based Conversion Coatings on Mg, Al, and Galvanized Steel Couples: *Surender Maddela*¹; Matthew O’Keefe¹; Yar-Ming Wang²; ¹Missouri University of Science and Technology; ²GM Research and Development

2:40 PM

Effect of Sn⁺ Additives on the Microstructure and Corrosion Resistance of Anodic Coating Formed on AZ31 Magnesium Alloy in Alkaline Solution: *S. Salman*¹; K. Kuroda²; N. Saito²; M. Okido²; ¹Graduate School of Engineering, Al-Azhar University, Nasr City, Cairo 11371, Egypt; ²Nagoya University

3:00 PM

Effect of Thickness on the Morphology and Corrosion Behavior of Cerium-Based Conversion Coatings on AZ31B Magnesium Alloy: *Carlos Castano*¹; Surender Maddela¹; Matthew O’Keefe¹; Yar-Ming Wang²; ¹Missouri University of Science and Technology; ²GM R&D Center

3:20 PM

Mechanical and Corrosion Properties of As-Cast and Extruded MG10GD Alloy for Biomedical Application: *Petra Maier*¹; Sören Müller²; Hajo Dieringa³; Norbert Hort³; ¹University of Applied Sciences Stralsund; ²Extrusion Research and Development Center TU Berlin; ³Helmholtz-Zentrum Geesthacht

3:40 PM Break

4:00 PM

Corrosion Behavior of Various Steels by AZ31 Magnesium Melt: *Cheuk Kin Tang*¹; Marie-Aline Van Ende¹; In-Ho Jung¹; ¹McGill University

4:20 PM

Corrosion of Ultrasonic Spot Welded Joints of Magnesium to Steel: *Tsung-Yu Pan*¹; Michael Santella¹; ¹Oak Ridge National Laboratory

4:40 PM

Effects of Orientation on Corrosion Behavior of Magnesium Single Crystals: Nguyen Dang Nam¹; Ming Zhe Bian¹; Kwang Seon Shin¹; *Hwa Chul Jung*¹; ¹Magnesium Technology Innovation Center, Seoul National University

5:00 PM

Effect of Some Microstructural Parameters on the Corrosion Resistance of Magnesium Alloys: Yaning Hu¹; Joseph Kish¹; *Joseph McDermid*¹; Wenye Zheng²; ¹McMaster University; ²CANMET-MTL



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5:20 PM

Influence of Aluminum Content on Corrosion Resistance of Mg-Al Alloys Containing Copper and Zinc: *Hiroyuki Kawabata*¹; Naohisa Nishino¹; Yoshikazu Genma²; Tsuyoshi Seguchi²; ¹Toyota Central R&D labs., inc.; ²Toyota Motor Corporation

Magnesium Technology 2012: High Temperature Processing and Properties

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht; Neale Neelameggham, U.S. Magnesium

Wednesday PM
March 14, 2012

Room: Southern V
Location: Dolphin Resort

Session Chairs: Paul Krajewski, General Motors; Warren Poole, University of British Columbia

2:00 PM

Effect of Rolling Temperature on the AZ31B Magnesium Alloy Microstructure: *Litzy Lina Catorceno*¹; Angelo Fernando Padilha¹; ¹USP

2:20 PM

Hot Formability Curves for Four Mg AZ31B Sheets Obtained by the Pneumatic Stretching Test: *Fadi Abu-Farha*¹; Ravi Verma²; Louis Hector²; ¹Penn State Erie; ²General Motors

2:40 PM

Texture Evolution during Hot Deformation Processing of Mg-3Sn-2Ca-0.4Al Alloy: Dharmendra Chalasani¹; *Pitcheswara Kamineni*¹; Y.V.R.K. Prasad²; Norbert Hort³; Karl Kainer³; ¹City University of Hong Kong; ²Independent Consultant; ³Helmholtz-Zentrum Geesthacht

3:00 PM

The Effects of Strain and Stress State in Hot Forming of Mg AZ31 Sheet: *Alex Carpenter*¹; Paul Sherek²; Louis Hector³; Paul Krajewski³; Jon Carter³; Eric Taleff¹; ¹The University of Texas at Austin; ²Mercer; ³General Motors

3:20 PM

Effect of Strain Rate on Dynamic Recrystallization in Magnesium under Compression at High Temperature: *Q. Ma*¹; B. Li¹; A.L. Oppedal¹; W. Whittington¹; S.J. Horstemeyer¹; E.B. Marin¹; H. El Kadiri¹; P.T. Wang¹; M.F. Horstemeyer¹; ¹Mississippi State University

3:40 PM Break

4:00 PM

Effect of Strain Rate on the Kinetics of Hot Deformation of AZ31 with Different Initial Texture: *Mehdi Sanjari*¹; Amir Farzadfar²; Atefeh Nabavi²; Elhachmi Essadiqi³; In-Ho Jung²; Steve Yue²; ¹McGill; ²McGill; ³CANMET

4:20 PM

Precipitation Behaviour of Micro-Alloyed Mg-Al-Ca Alloys during Heat Treatment and Hot Compression: *Jing Su*¹; Shirin Kaboli¹; Abu Syed Humaun Kabir¹; Phuong Vo¹; In-Ho Jung¹; Steve Yue¹; ¹McGill

4:40 PM

Diffusion Couple Investigation of the Mg-Zn System: *Sarah Brennan*¹; Katrina Bermudez¹; Nagraj Kulkarni²; Yongho Sohn¹; ¹University of Central Florida; ²Oak Ridge National Laboratory

5:00 PM

Biaxial Deformation Behavior of AZ31 Magnesium Alloy at High Temperature: *Yamashita Daisuke*¹; Masafumi Noda¹; Kunio Funami¹; ¹Chiba Institute of Technology

Materials and Fuels for the Current and Advanced Nuclear Reactors: Modeling I

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS/ASM: Nuclear Materials Committee

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Wednesday PM
March 14, 2012

Room: Swan 4
Location: Swan Resort

Session Chair: Paul Millett, Idaho National Laboratory

2:00 PM

Cluster Dynamics and Kinetic Monte Carlo Simulations of Atomistic to Nanoscale Defect Dynamics in In-Situ TEM Irradiation on Thin Molybdenum Foils: *Donghua Xu*¹; Brian Wirth¹; Meimei Li²; Mark Kirk²; ¹University of Tennessee-Knoxville; ²Argonne National Laboratory

2:20 PM

Kinetic Monte Carlo Simulation of He Bubble Nucleation at Different Types of Grain Boundaries in Mo: *Liangzhe Zhang*¹; Paul Millett¹; Michael Tonks¹; Yongfeng Zhang¹; Bulent Biner¹; ¹Idaho National Laboratory

2:40 PM

He Bubble Nucleation at Grain Boundaries (GBs) in BCC Mo: Molecular Dynamics Simulations: *Yongfeng Zhang*¹; Paul Millett¹; Michael Tonks¹; Liangzhe Zhang¹; Bulent Biner¹; ¹Idaho National Lab

3:00 PM

Strip-Yield Modeling of Creep Crack Incubation and Growth in Cr-Mo Steels for Nuclear Reactor Applications: *Gabriel Potirniche*¹; Mehdi Basirat¹; ¹University of Idaho

3:20 PM

Peculiarities of Creep Temperature Dependence in Irradiated Materials: *Pavlo Selyshchev*¹; Volodimir Sugakov²; ¹University of Pretoria; ²Institute for Nuclear Research

3:40 PM Break

3:50 PM

Ab Initio Study of Radiation Induced Amorphization in ZrC: *Ming-Jie Zheng*¹; Dane Morgan¹; Izabela Szlufarska¹; ¹University of Wisconsin - Madison

4:10 PM

Phase-Field Simulation and Experimental Studies of Oxidation of Zirconium: *Mohsen Asle Zaeem*¹; Haitham El Kadiri¹; Mark Horstemeyer¹; ¹Mississippi State University

4:30 PM

Characterization and Modeling of Creep Mechanisms in Zircaloy-4: *Benjamin Morrow*¹; Robert Kozar²; Ken Anderson²; Michael Mills¹; ¹The Ohio State University; ²Bechtel Marine Propulsion Corp.

4:50 PM

High-Temperature Creep and Superplasticity in Zirconium Alloys: Applications to LOCA Conditions: *Ali Massih*¹; ¹Quantum Technologies

WEDNESDAY PM

5:10 PM

Charge Optimized Many Body (COMB) Potential for the Zr-ZrO₂ system: *Mark Noordhoek*¹; Tao Liang¹; Tzu-Ray Shan¹; Susan Sinnott¹; Simon Phillpot¹; ¹University of Florida

Materials and Fuels for the Current and Advanced Nuclear Reactors: Structural Materials - Characterization

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS/ASM: Nuclear Materials Committee

Program Organizers: Ramprasad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Wednesday PM
March 14, 2012

Room: Swan 2
Location: Swan Resort

Session Chair: Micah Hackett, Terra Power

2:00 PM

Long-Term High-Temperature Microstructure Stability and Mechanical Properties of Advanced Ferritic-Martensitic Steels: *Lizhen Tan*¹; Jeremy Busby¹; ¹Oak Ridge National Laboratory

2:20 PM

Characterization of Surface Modifications of 316L Stainless Steel: Giovanni Facco¹; Andreas Kulovits¹; *Jorg Wiezorek*¹; ¹University of Pittsburgh

2:40 PM

Investigation of Effect of Zr Allotropic Transformation on Interdiffusion between Mo and Zr: *Ashley Ewh*¹; Judith Dickson¹; Yongho Sohn¹; ¹University of Central Florida

3:00 PM

Characterization of Oxide Dispersion-Strengthened (ODS) Alloy Powders Processed by Mechano Chemical Bonding (MCB) and Ball Milling: *Longzhou Ma*¹; Bruce Kang²; C.C Huang³; ¹University of Nevada Las Vegas; ²West Virginia University; ³Hosokawa Micron Powder Systems

3:20 PM

Laser Welding of Alloy 690 for Nuclear Power Systems: *Julie Tucker*¹; Terry Nolan¹; George Young¹; ¹Knolls Atomic Power Laboratory

3:40 PM Break

3:50 PM

Pulsed Magnetic Welding for Advanced Core and Cladding Steels: *Yong Yang*¹; Sindo Kou²; Todd Allen²; ¹University of Florida; ²University of Wisconsin-Madison

4:10 PM

Effects of Laser Shock Peening on Residual Stress, Microstructure and Corrosion Behavior of Alloy 600: *Abhishek Telang*¹; Amrinder Gill¹; James Guenes¹; S Mannava¹; Dong Qian¹; Vijay Vasudevan¹; ¹University of Cincinnati

4:30 PM

Nanoindentation and the Micromechanics of Zry-4: *Christabel Evans*¹; Trevor Lindley¹; David Dye¹; ¹Imperial College London

4:50 PM

Characterization of Zirconium Excel Alloy for Generation IV CANDU SCW Reactors: *Mohammad Sattari*¹; Richard Holt¹; Mark Daymond¹; ¹Queen's University

5:10 PM

Order-Disorder Transformation in a Ni-Cr-Mo Alloy: Amit Verma¹; *Jung Singh*¹; M Sundararaman²; Nelia Wanderka³; ¹Bhabha Atomic Research Centre; ²University of Hyderabad; ³Helmholtz-Zentrum Berlin für Materialien und Energie GmbH

Materials Design Approaches and Experiences III: High Strength Steels

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Ji-Cheng Zhao, The Ohio State University; Akane Suzuki, GE Global Research; Deb Whitis, GE Aviation; Michael Fahrman, Haynes International Inc.; Qiang Feng, University of Science and Technology Beijing

Wednesday PM
March 14, 2012

Room: Europe 11
Location: Dolphin Resort

Session Chairs: Qiang (Charles) Feng, University of Science and Technology Beijing; Michael Fahrman, Haynes International, Inc.

2:00 PM Invited

Alloy Design of 9% Cr Steel for High Efficiency Ultra-Supercritical Power Plants: *Fujio Abe*¹; ¹National Institute for Materials Science

2:30 PM Invited

Advanced Heat Resistant Austenitic Stainless Steel for A-USC Power Plant: *Guocai Chai*¹; ¹Sandvik Materials Technology

3:00 PM Invited

In Situ Inclusion Behavior in Ultra-High Strength Steels: Jon Groh¹; Mark Rhoads¹; ¹General Electric Company

3:30 PM Break

3:50 PM Invited

Development of High-Performance Structural Alloys for Nuclear Energy Systems: *Steven Zinkle*¹; Michael Brady¹; Yuki Yamamoto¹; Michael Santella¹; Phillip Maziasz¹; David Hoelzer¹; Jeremy Busby¹; Lizhen Tan¹; Govindarajan Muralidharan¹; ¹Oak Ridge National Laboratory

4:20 PM Invited

Design Approaches and Performance of Novel Austenitic Heat Resistant Steels Strengthened by TCP/GCP Intermetallics for A-USC Power Plants: *Masao Takeyama*¹; Imanuel Tarigan²; ¹Tokyo Institute of Technology, Consortium of the Japan Research and Development Center for Materials (JRCM); ²Tokyo Institute of Technology

4:50 PM

Effect of Grain Boundary Laves Phase on Mechanical Properties of Fe-20Cr-30Ni-2Nb Steels: *Naoya Kanno*¹; Naoki Takata²; Masao Takeyama²; ¹Tokyo Institute of Technology; ²Tokyo Institute of Technology, Consortium of the Japan Research and Development Center for Materials (JRCM)

5:10 PM

Microstructural Studies on Thermomechanically Processed Plain Carbon Dual Phase Steel: Abhishek Singh¹; G Chaudhari¹; Mukesh Bharadwaj¹; *S Nath*¹; I. I. T. Roorkee



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Materials Research in Microgravity: Session VI

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Robert Hyers, University of Massachusetts; Hani Henein, University of Alberta; Valdis Bojarevics, University of Greenwich; James Downey, NASA; Douglas Matson, Tufts University; Achim Seidel, Astrium; Daniela Voss, ESA

Wednesday PM Room: Asia 3
March 14, 2012 Location: Dolphin Resort

Session Chair: To Be Announced

2:00 PM Invited

Coarsening of Two-Phase Mixtures: Experiments on the International Space Station: J. Thompson¹; E. Gulsoy¹; *Peter Voorhees*¹; ¹Northwestern University

2:35 PM Invited

Multi-Scale Modeling on Liquid Phase Sintering Affected by Gravity: Preliminary Analysis: *Eugene Olevsky*¹; Randall M. German¹; ¹San Diego State University

3:10 PM

Self-assembly of Ni-nanoparticles in Aerosols Produced Thermally On-ground and under Microgravity Conditions: *Stefan Lösch*¹; Bernd Günther¹; Daniela Nolle²; Eberhard Göring²; ¹Fraunhofer; ²Max-Planck-Institut

3:35 PM Break

3:55 PM Invited

Crystallographic Stability of Metastable Phase Formed by Containerless Processing in REFeO₃ (RE: Rare-Earth Element): *Kazuhiko Kuribayashi*¹; M.S. Vijaya Kumar²; ¹Shibaura Institute of Technology; ²Institute of Space and Astronautical Science, JAXA

4:30 PM

On-Line Real Time Diagnostics of a Single Fluid Atomization System: *Pooya Delshad Khatibi*¹; Arash Ilbagi¹; Hani Henein¹; ¹University of Alberta

4:55 PM

Electrodeposition of Metals in Microgravity Conditions: Yasuhiro Fukunaka¹; ¹JAXA/Waseda University

5:20 PM

Propagation Regime of Iron Dust Flames: *Francois Tang*¹; Samuel Goroshin²; Andrew Higgins²; ¹European Space Agency; ²McGill

Mechanical Behavior at Nanoscale I: Nanomechanical Experiment and Modeling

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Scott Mao, University of Pittsburgh; Julia R Greer, California Institute of Technology; Jianyu Huang, Center for Integrated Nanotechnologies; Marc Legros, CEMES-CNRS; Ting Zhu, Georgia Institute of Technology

Wednesday PM Room: Asia 1
March 14, 2012 Location: Dolphin Resort

Session Chairs: Daniel Gianola, University of Pennsylvania; Julia Greer, California Institute of Technology (Caltech)

2:00 PM Invited

Effect of Electric Current on Nanoindentation of Copper: *Fuqian Yang*¹; ¹University of Kentucky

2:20 PM

Structure Effects on the Bending Strength of Si Nanowires: *Gheorghe Stan*¹; Sergiy Krylyuk¹; Albert Davydov¹; Igor Levin¹; Robert Cook¹; ¹National Institute of Standards and Technology

2:40 PM

Extended Structure of Point Defects in Graphene: *Mark Jhon*¹; David Srolovitz¹; ¹Institute of High Performance Computing

3:00 PM

Estimation of Dislocation Nucleation Stresses from Nanoindentation by Combined Modeling and Experiment: *Li Ma*¹; Dylan Morris²; Steffanni Jennerjohn³; David Bahr³; Lyle Levine¹; ¹NIST; ²Michelin North America; ³Washington State University

3:20 PM

Interaction of the Microstructure and Test Geometry on the Size Dependence of Plasticity: *Andy Bushby*¹; David Dunstan¹; ¹Queen Mary, University of London

3:40 PM

Quantifying Polysilicon Strength Size Effects Using an In-Situ on-Chip Tensile Test Platform: Mohamed Saleh¹; Siddharth Hazra¹; *Jack Beuth*¹; Maarten de Boer¹; ¹Carnegie Mellon University

4:00 PM Break

4:10 PM

Humidified Nanoindentation: Grant Klafehn¹; *Corinne Packard*¹; ¹Colorado School of Mines

4:30 PM

A Nanoscale Investigation on Effect of Hydrogen in Confined Volumes: *Ilaksh Adlakha*¹; Kiran Solanki¹; Amitava Moitra²; Mark Tschopp³; ¹SEMTE; ²Pennsylvania State University; ³Mississippi State University

4:50 PM

Automated Analysis of Crystal Defects in Large-Scale Atomistic Computer Simulations: *Alexander Stukowski*¹; Tom Arsenlis¹; ¹Lawrence Livermore National Laboratory

5:10 PM

Nanoindentation of Nanoporous Polycrystalline Platinum: Ran Liu¹; Yuan Li¹; *Antonia Antoniou*¹; ¹Georgia Institute of Technology

5:30 PM

Deformation Mechanism of Nanocrystalline Copper during Relaxation Test: *Junya Inoue*¹; Saethavuth Krasienapibal¹; Toshihiko Koseki¹; ¹The University of Tokyo

Mechanical Behavior Related to Interface Physics: Deformation Mechanisms in Nanoscale Materials

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Izabela Szlufarska, University of Wisconsin-Madison; Zhiwei Shan, Xi'an Jiaotong University

Wednesday PM
March 14, 2012

Room: Oceanic 1
Location: Dolphin Resort

Session Chairs: Julia Greer, California Institute of Technology; Jianyu Huang, Sandia National Laboratories

2:00 PM Keynote

Deformation Mechanisms in Single Boundary-Containing Metallic Nano-Pillars: Grain, Phase, and Crystal Boundaries: *Julia Greer*¹; Robert Maass¹; Xun Gu¹; Qiang Guo¹; Siddhartha Pathak¹; ¹California Institute of Technology

2:30 PM Keynote

Lithiation Induced Stress and Failure of Anode Materials in Lithium Ion Batteries: *Jianyu Huang*¹; ¹Sandia National Laboratories

3:00 PM

Effect of Contact Interface on the Mechanical Behavior of Submicro Sized Au Particles: Zhangjie Wang¹; *Zhiwei Shan*¹; Ju Li²; Jun Sun¹; Evan Ma³; ¹Center for Advancing Materials Performance from the Nanoscale (CAMP-Nano) & Hysitron Applied Research Center in China (HARCC), State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University; ²Department of Nuclear Science and Engineering and Department of Materials Science and Engineering, Massachusetts Institute of Technology; ³Department of Materials Science and Engineering, Johns Hopkins University

3:15 PM

Exhaustion Hardening in Mo-alloy Nanofibers: *Claire Chisholm*¹; Hongbin Bei²; Matthew Lowry¹; Jason Oh³; S.A. Syed Asif²; Oden Warren³; Zhiwei Shan⁴; Easo George⁵; Andrew Minor¹; ¹University of California, Berkeley and National Center for Electron Microscopy; ²Materials Science and Technology Division, Oak Ridge National Laboratory; ³Hysitron Incorporated; ⁴Center for Advancing Materials Performance from the Nanoscale (CAMP-Nano), State Key Laboratory for Mechanical Behavior of Materials, Xi'an University and Hysitron Incorporated; ⁵Materials Science and Technology Division, Oak Ridge National Laboratory and Department of Materials Science and Engineering, University of Tennessee, Knoxville

3:30 PM

Fracture Toughness of Nanocrystalline Cu and Cu-Cr pillars Thin Film Composites: *Sharvan Kumar*¹; Seong-Woong Kim²; Jin-Woo Yi¹; Hyun-Gyu Kim³; Kyung-Suk Kim¹; ¹Brown University; ²Korea Institute of Materials Science; ³Seoul National University of Technology

3:45 PM Break

3:55 PM Keynote

Friction and Mechanics of Lamellar and Nanostructured MoS₂: Eric Bucholz¹; Simon Phillpot¹; *Susan Sinnott*¹; ¹University of Florida

4:25 PM Keynote

Dislocation-Twin Interactions in Nanocrystalline fcc Metals: *Yuntian Zhu*¹; ¹North Carolina State University

4:55 PM

Investigating the Role of Grain Boundaries during the Plastic Deformation of Bicrystalline Nanowires Using Molecular Dynamics: *Garritt Tucker*¹; Zachary Aitken²; Julia Greer²; Christopher Weinberger¹; ¹Sandia National Laboratories; ²California Institute of Technology

5:10 PM

Interpreting Hardness Data in Multilayer Thin Films: *Michael Gram*¹; John Carpenter²; George Pharr³; Peter Anderson¹; ¹Ohio State University; ²Los Alamos National Laboratory; ³University of Tennessee

5:25 PM

Interaction between Lattice Dislocation and Weak Interface in Anisotropic Bi-Crystal Composites: *Haijian Chu*¹; Jian Wang²; Caizhi Zhou²; Irene Beyerlein²; ¹Yangzhou University; Los Alamos National Laboratory; ²Los Alamos National Laboratory

Mechanical Performance of Materials for Current and Advanced Nuclear Reactors: Irradiation Performance of Advanced and Model Alloys

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Nicholas Barbosa, National Institute of Standards & Tech; Greg Oberson, United States Nuclear Regulatory Commission; Matthew Kerr, United States Nuclear Regulatory Commission; Elaine West, Knolls Atomic Power Laboratory; Stuart Maloy, Los Alamos National Laboratory; Osman Anderoglu, LANL

Wednesday PM
March 14, 2012

Room: Swan 1
Location: Swan Resort

Session Chairs: Osman Anderoglu, Los Alamos National Laboratory; Stuart Maloy, Los Alamos National Laboratory

2:00 PM Invited

Effect of Irradiation on the Tensile and Impact Properties of Structural and Cladding Materials: *Jean Henry*¹; Xavier Averty¹; Philippe Dubuisson¹; ¹CEA

2:30 PM

Rate Sensitivity in Irradiated HT-9 for Reactor Applications: *Stuart Maloy*¹; Tarik Saleh¹; Tobias Romero¹; Sara Perez-Bergquist¹; Mychailo Toloczko¹; ¹Los Alamos National Laboratory

2:50 PM

High Temperature Mechanical Properties of Nanostructured Ferritic Alloys and Advanced Ferritic-Martensitic Steels: *Thak Sang Byun*¹; David Hoelzer¹; Lizhen Tan¹; Stuart Maloy²; ¹Oak Ridge National Laboratory; ²Los Alamos National Laboratory

3:10 PM

Radiation Damage in ODS Ferritic Steel under Multi-Ion-Beam Irradiation: *Luke Hsiung*¹; Michael Fluss¹; Scott Tumey¹; Bill Choi¹; ¹Lawrence Livermore National Laboratory



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3:30 PM

Radiation Tolerant Metallic Multilayers: *Xinghang Zhang*¹; L. Shao¹; H. Wang¹; E.G. Fu²; Nan Li²; A. Misra²; Y-Q Wang²; ¹Texas A&M University; ²Los Alamos National Laboratory

3:50 PM Break

4:10 PM

Irradiation Response of Nanostructured Austenitic Model Alloy: *Yong Yang*¹; Cheng Sun²; Xinghang Zhang²; Todd Allen³; ¹University of Florida; ²Texas A&M University; ³University of Wisconsin-Madison

4:30 PM

Microstructure and Mechanical Properties of Proton Irradiated Titanium Aluminides: *Ming Tang*¹; Yong-won Kim²; Yongqiang Wang¹; Stuart Maloy¹; ¹Los Alamos National Laboratory; ²UES-Materials & Processes

4:50 PM

Mechanical Properties and Radiation Response of Ultrafine Grained Fe-Cr-Ni Alloy: *C. Sun*¹; J. Ma¹; K.Y. Yu¹; K. T Hartwig¹; L. Shao¹; S.A. Maloy²; X Zhang¹; ¹Texas A&M University; ²Los Alamos National Lab

5:10 PM

In Situ Study of Radiation Damage in Pure Zr and Zircaloy-2: *Yasir Idrees*¹; Zhongwen Yao¹; Mark Daymond¹; ¹Queens University

Minerals, Metals and Materials under Pressure: Damage and Microstructure

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS/ASM: Phase Transformations Committee
Program Organizers: Ellen Cerreta, Los Alamos National Laboratory; Richard Hennig, Cornell University; Dallas Trinkle, University of Illinois, Urbana-Champaign; Vijay Vasudevan, Univ. Cincinnati

Wednesday PM
March 14, 2012

Room: Europe 7
Location: Dolphin Resort

Session Chair: Ellen Cerreta, Los Alamos National Laboratory

2:00 PM Invited

Isolating the Influence of Kinetic and Spatial Effects on Dynamic Damage Evolution in OFHC Cu: *Darcie Dennis-Koller*¹; Pablo Escobedo-Diaz¹; Ellen Cerreta¹; ¹Los Alamos National Laboratory

2:30 PM

Effect of Release Rate on the Dynamic Tensile Response of Polycrystalline Copper: *Juan Escobedo*¹; Ellen Cerreta¹; Darcie Dennis-Koller¹; Carl Trujillo¹; Curt Bronkhorst¹; ¹Los Alamos National Laboratory

2:50 PM

Continuum Scale Material Modeling under Large Strain, Strain Rates and Pressure Incorporating Microstructure Effect: *Nicola Bonora*¹; Andrew Ruggiero¹; Gianluca Iannitti²; Simone Dichiaro¹; ¹University of Cassino; ²Techdyn Engineering

3:10 PM

Mechanical Properties and Constitutive Modeling of Metals under Shock Deformation: *Shuh Rong Chen*¹; Gerooge Gray¹; ¹Los Alamos National Laboratory

3:30 PM

3-D Modeling of Incipient Spall Damage in Shocked FCC Multicrystals Using Crystal Plasticity: *Kapil Krishnan*¹; Leda Wayne¹; Andrew Brown¹; Pedro Peralta¹; Shengnian Luo²; Darrin Byler²; Aaron Koskelo²; ¹Arizona State University; ²Los Alamos National Laboratory

3:50 PM Break

4:00 PM Invited

Low Temperature Twinning in Tantalum: *Mukul Kumar*¹; ¹Lawrence Livermore National Laboratory

4:30 PM

Review of Pressure Effects on Flow and Fracture of Materials: *John Lewandowski*¹; ¹Case Western Reserve Univ

4:50 PM

The Effects of Microstructural Evolution on the Spall Response of 1100 Aluminum: *Cyril Williams*¹; Changqiang Chen²; Kalias Ramesh²; Datta Dandekar¹; ¹U.S. Army Research Laboratory; ²The Johns Hopkins University

5:10 PM

The Role of Crystallite Orientation & Grain Boundary Character on the Uniaxial Dynamic Tensile Response in Commercially Pure 1050 Aluminum: *Nathaniel Sanchez*¹; Darcie Dennis-Koller²; David Field³; ¹Los Alamos National Laboratory/Washington State University; ²Los Alamos National Laboratory; ³Washington State University

Nanocomposites: Nanocomposites for Energy Transport, Harvesting and Storage

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Composite Materials Committee

Program Organizers: Garth Wilks, Air Force Research Laboratory; Jonathan Spowart, Air Force Research Laboratory; Meisha Shofner, Georgia Institute of Technology; John Zhanhu Guo, Lamar University

Wednesday PM
March 14, 2012

Room: Swan 8
Location: Swan Resort

Session Chairs: Garth Wilks, Air Force Research Laboratory; Jaime Grunlan, Texas A & M University

2:00 PM Invited

Thermoelectric Nanocomposites: Effect of Nanostructures on Lattice Thermal Conductivity: *Terry Tritt*¹; Wenjie Xie²; Xinfeng Tang²; ¹Clemson University; ²Wuhan University of Technology

2:40 PM

Stabilization of Graphene-Polyaniline Based Nanocomposite Electrodes Using Barium Strontium Titanate for Supercapacitor Application: *Supriya Ketkar*¹; Manoj Ram¹; Ashok Kumar¹; Thomas Weller¹; Andrew Hoff¹; ¹University of South Florida

3:00 PM Invited

Thermoelectric Study of InGaN-Based Materials for Thermal Energy Harvesting: Liqing Su¹; Bahadir Kucukgok¹; Elisa Hurwitz²; Ian Ferguson; *Na Lu*²; ¹University of North Carolina at Charlotte; ²University of North Carolina at Charlotte

3:40 PM

Nanocomposites for Electrochemical Energy Storage: *Yuanbing Mao*¹; Elizabeth Martinez¹; ¹University of Texas-Pan American

4:00 PM Break

4:20 PM Invited

Thick and Thin Film Polymer – Carbon Nanotube Composites for Thermoelectric Energy Conversion and Transparent Electrodes: *Jaime Grunlan*¹; Yeon Seok Kim¹; Choongho Yu¹; Yong Tae Park¹; Gregory Moriarty¹; ¹Texas A&M University

5:00 PM

Epoxy Resin Nanocomposites Reinforced with Conductive Polyaniline Nanostructures: *Xi Zhang*¹; Jiahua Zhu¹; Suying Wei¹; John Zhanhu Guo¹; ¹Lamar University

5:20 PM

Synthesis, Characterization & Applications of Nanodiamond – Conductive Polymer Nanocomposites Films: *Humberto Gomez*¹; Manoj Ram²; Ashok Kumar²; ¹Universidad del Norte; ²University of South Florida

5:40 PM

Evaluation of Electrochemical Performance of a graphene–poly(o-toluidine) Nanocomposite for Supercapacitor Applications: *Punya Basnayaka*¹; Farah Alvi¹; Manoj Ram¹; Ashok Kumar¹; ¹University of South Florida

Neutron and X-Ray Studies of Advanced Materials V: Centennial: Three Dimensional Studies

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Xun-Li Wang, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Lyle Levine, National Institute of Standards and Technology; Peter Liaw, Univ of Tennessee; Yandong Wang, Beijing Institute of Technology; Brent Fultz, California Institute of Technology

Wednesday PM
March 14, 2012

Room: Southern I
Location: Dolphin Resort

Funding support provided by: Office of Basic Energy Sciences, U.S. Dept. of Energy, Dr. P. Thiyagarajan

Session Chairs: John Budai, Oak Ridge National Laboratory; Leyun Wang, MSU

2:00 PM Keynote

Next Generation 3DXRD: *Henning Poulsen*¹; Søren Schmidt¹; Erik Lauridsen¹; Andrew King²; Gavin Vaughan²; Jonathan Wright²; Wolfgang Ludwig²; Jette Oddershede¹; Xiaoxu Huang¹; Wolfgang Pantleon¹; Dorte Juul Jensen¹; ¹Risoe DTU; ²ESRF

2:25 PM Invited

X-Ray Topography Studies of Synthetic Diamonds for Use as Optical Elements at Synchrotron X-Ray Sources: *Albert Macrander*¹; Xianrong Huang¹; Ali Khounsary¹; Josef Maj¹; Lahsen Assoufid¹; ¹Argonne National Laboratory

2:45 PM Invited

Microstructure inside Nanocrystals Using Laue X-Ray Micro-Diffraction: *John Budai*¹; Jonathan Tischler¹; Zhengwei Pan²; Alexander Tselev¹; Andrei Kolmakov³; ¹Oak Ridge National Laboratory; ²University of Georgia; ³Southern Illinois University

3:05 PM Invited

In-Situ Micro-Beam X-Ray Diffraction Studies on Advanced High-Strength Steels: *Niels van Dijk*¹; ¹Delft University of Technology

3:25 PM

3D Visualization and Modeling of Deformation in Pb-Free Solders Using X-Ray Tomography: *Eric Padilla*¹; Vaidehi Jakkali¹; Mario Pacheco²; Nikhilesh Chawla¹; ¹Arizona State University; ²Intel Corporation

3:35 PM

Nondestructive Determination of Residual Stress Using Strain Pole Figure Measurements and a Multiscale Workpiece Discretization: *Jun-Sang Park*¹; Matthew Miller¹; Eralp Demir¹; Paul Dawson¹; Ulrich Lienert²; ¹Cornell University; ²Argonne National Laboratory

3:50 PM

Annealing Study of Grain Boundary Engineered Copper Using High Energy X-Ray Diffraction Microscopy: *S. F. Li*¹; R. Suter¹; C. Hefferan¹; J. Lind¹; U. Lienert²; J. Bernier³; M. Kumar³; B. Reed³; ¹Carnegie Mellon University; ²Argonne National Lab; ³Lawrence Livermore National Lab

4:05 PM Break

4:15 PM Invited

Study of Geometrically Necessary Dislocations by Depth-Resolved 3D X-Ray Microdiffraction and Crystal Plasticity Modeling: *Leyun Wang*¹; Hongmei Li²; Rozaliya Barabash³; Martin Crimp²; Carl Boehlert²; Philip Eisenlohr⁴; Thomas Bieler²; Wenjun Liu¹; ¹Argonne National Laboratory; ²Michigan State University; ³Oak Ridge National Laboratory; ⁴Max-Planck-Institut für Eisenforschung

4:35 PM

The Plastic Behavior of Micron Sized Single Crystals under Compression and Tension Analyzed by X-Ray μ Laue dDiffraction: *Christoph Kirchlechner*¹; Marlene Kapp²; Wolfgang Grosinger¹; Peter Imrich²; Christian Motz²; Jozef Keckes¹; Jean-Sebastien Micha³; Olivier Ulrich³; Gerhard Dehm¹; ¹University of Leoben; ²Austrian Academy of Sciences; ³ESRF

4:50 PM

Plasticity Evolution in the Nanoscale Cu/Nb Multilayers as Revealed by Synchrotron X-Ray Microdiffraction: *Arief Budiman*¹; N. Li¹; L. A. Berla²; N. Tamura³; M. Kunz³; W. D. Nix²; J. Wang¹; A. Misra¹; ¹Los Alamos National Laboratory (LANL); ²Stanford University; ³Advanced Light Source (ALS), Berkeley Lab

5:05 PM

Grain Growth of High Purity Nickel with High Energy X-Ray Diffraction Microscopy (HEM): *C.M. Hefferan*¹; S.F. Li²; J. Lind¹; U. Lienert³; A.D. Rollett¹; R.M. Suter¹; ¹Carnegie Mellon University; ²Lawrence Livermore National Laboratory; ³Argonne National Laboratory

5:20 PM Invited

X-Ray Laue Diffraction 3D Microscopy - Upgrade and New Opportunities: *Wenjun Liu*¹; Ruqing Xu¹; Paul Zschack¹; John Budai²; Jon Tischler²; ¹Argonne National Laboratory; ²Oak Ridge National Laboratory

5:40 PM

Investigation of Twin Inception and Growth in Three Dimensions: *Hamid Abdolvand*¹; *Marta Majkut*¹; Jette Oddershede²; Ulrich Lienert³; Bradley Diak¹; Mark Daymond¹; ¹Department of Mechanical and Materials Engineering, Queen's University; ²Risø National Laboratory for Sustainable Energy, Technical University of Denmark; ³Advanced Photon Source, Argonne National Laboratory

5:50 PM

X-Ray Micro-Diffraction Study of Crystallographic Orientation and Strain Distribution inside Microscopic Shear Bands Consisting of Martensite Plates: *Nan Li*¹; Yandong Wang¹; Wenjun Liu²; Dongping Wang¹; Guilin Wu¹; Peter Liaw³; ¹Beijing Institute of Technology; ²Argonne National Laboratory; ³The University of Tennessee



TMS 2012

141st Annual Meeting & Exhibition

Pb-Free Solders and Other Materials for Emerging Interconnect and Packaging Technologies: Whisker Growth in Tin and Related Solder Alloys

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Iver Anderson, Ames Laboratory; Sung Kang, IBM; Albert Wu, National Central Univ; Laura Turbini, Research in Motion; Tae-Kyu Lee, Cisco Systems; Govindarajan Muralidharan, Oak Ridge National Lab; John Elmer, Lawrence Livermore National Lab; Yan Li, Intel

Wednesday PM
 March 14, 2012
 Room: Swan 9
 Location: Swan Resort

Session Chair: Laura Turbini, Research in Motion

2:00 PM Invited

Effects of Grain Misorientation & Strain Distribution on Whisker Formation on Electroplated Sn-Cu films: *Carol Handwerker¹*; Pylin Sarobol¹; Wei-Hsun Chen¹; Peng Su²; John Blendell¹; ¹Purdue University; ²Cisco

2:30 PM Invited

Probing Mechanisms for Sn Whisker Growth by In Situ Nanoindentation in a Scanning Electron Microscope: Nicholas Chapman¹; Jason Williams¹; *Nikhilesh Chawla¹*; ¹Arizona State University

3:00 PM

Understanding the Variation in Mechanical Properties of Sn Films with Alloying and Modification of Microstructure: *Nitin Jadhav¹*; Maureen Williams²; Fei Pei¹; Gery Stafford²; Eric Chason¹; ¹Brown University; ²National Institute of Standards and Technology

3:20 PM

Mitigation and Verification Method of Sn Whisker Growth for Pb-free Automotive Electronics: *Won Sik Hong¹*; Cul Min Oh¹; Do Seop Kim²; ¹Korea Electronics Technology Institute(KETI); ²Hyundai Motor Company

3:40 PM Break

3:50 PM

Crystallographic Characterization of an Electroplated Zinc Coating: *Philippe Pareige¹*; Auriane Etienne¹; Agnès LINA²; Laurent Créton²; ¹Rouen University; ²EDF

4:10 PM

Real-Time Study of Whisker Formation in Tin/Copper Systems by EBSD Characterization: *Fei Pei¹*; Nitin Jadhav¹; Eric Chason¹; ¹Brown University

4:30 PM

Tin Whisker and Hillock Formation on Thermally Cycled, Large Grained Pb-Free Solder Alloy Films: *John Koppes¹*; Pylin Sarobol¹; Wei-Hsun Chen¹; Peng Su²; John Blendell¹; Carol Handwerker¹; ¹Purdue University; ²Cisco Systems

4:50 PM

Precipitation of Large Ag₃Sn Intermetallic Compounds in SnAg_{2.5} Microbumps after Multiple Reflows in 3D-IC Packaging: *Ming-Yung Guo¹*; Wei-Chi Sung¹; Chih Chen¹; ¹National Chiao Tung University

Processing to Control Morphology and Texture in Magnetic Materials: Thin Films and Applications

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee
Program Organizers: Matthew Kramer, Iowa State University; Mike McHenry, Carnegie Mellon University; David Laughlin, Carnegie Mellon University; Jinfang Liu, Electron Energy Corporation; Bill Soffa, University of Virginia; Ivan Skorvanek, Institute of Experimental Physics

Wednesday PM
 March 14, 2012
 Room: Europe 10
 Location: Dolphin Resort

Session Chairs: William Soffa, University of Virginia; Ichiro Takeuchi, University of Maryland

2:00 PM Invited

Nanostructure Optimization of FePt Thin Films for Magnetic Recording: *Kazuhiro Hono¹*; Yukiko K Takahashi¹; ¹National Institute for Materials Science

2:25 PM Invited

Control of Texture and Morphology of Thin Films for Magnetic Recording Applications: *David Laughlin¹*; En Yang¹; Hoan Ho¹; Vincent Sokalski¹; Jimmy Zhu¹; ¹Carnegie Mellon

2:50 PM

Combinatorial Search of Rare-Earth-Free Permanent Magnets: Magnetic and Microstructural Properties of Fe-Co-W Thin Films: Tieren Gao¹; *Ichiro Takeuchi¹*; Yaqiao Wu¹; Matthew Kramer¹; Iver Anderson¹; Bill McCallum¹; Kevin Dennis¹; ¹University of Maryland

3:05 PM

Effect of Rapid Annealing on the Microstructure of FeSiNbBCu Alloys: *Pradeep Konda Gokuldoss¹*; Pyuck-pa Choi¹; Dierk Raabe¹; Giselher Herzer²; ¹Max Planck Institute for Iron Research GmbH; ²Vacuumschmelze GmbH & Co. KG

3:20 PM Break

3:40 PM Invited

Large Abnormal Grain Growth Behavior in Galfenol Rolled Sheets: *Qingfeng Xing¹*; Adam Boesenberg²; Eric Summers²; Thomas Lograsso¹; ¹Ames Laboratory; ²ETREMA Products, Inc.

4:05 PM Invited

The Role of Crystallographic Texture in Microwave and Millimet: Yajie Chen¹; Anton Geiler²; Trifon Fitchorov¹; Andrew Daigle²; Carmine Vittoria¹; *Vincent Harris¹*; ¹Northeastern University; ²Metamagnetics Inc.

4:30 PM

Role of Alloying Elements in Improvement of Alnico Permanent Magnet Alloys: *Scott Long¹*; R.W. McCallum¹; M.J. Kramer¹; Kevin Dennis¹; D.T. Cavanaugh¹; Y.Q. Wu¹; I.E. Anderson¹; ¹Ames Laboratory

4:45 PM

Structure and Chemistry of the Alnico Spinodal: *Matthew Kramer¹*; YaQiao Wu²; V. Antropov²; S. Long²; K. Dennis²; R. McCallum²; I. Anderson²; S. Constantinides³; ¹Iowa State University; ²Ames Laboratory; ³Arnold Magnetic Technologies

Radiation Effects in Ceramic Oxide and Novel LWR Fuels: Effects of Radiation on Thermal Transport and Fuel Performance

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Peng Xu, University of Wisconsin; Jian Gan, Idaho National Laboratory; Ram Devanathan, Pacific Northwest National Laboratory; Edward Lahoda, Westinghouse Electric Company; Michele Manuel, University of Florida; Ramprasad Prabhakaran, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Wednesday PM
March 14, 2012

Room: Macaw 2
Location: Swan Resort

Funding support provided by: The Center for Materials Science of Nuclear Fuel, an Energy Frontier Research Center led by the Idaho National Laboratory

Session Chairs: Edward Lahoda, Westinghouse Electric Company; Peng Xu, Westinghouse Electric Company

2:00 PM Invited

Effects of Radiation on Thermophysical Properties of Ceramic Oxide Fuels: *Dragos Staicu*¹; ¹European Commission, Joint Research Centre, Institute for Transuranium Elements

2:30 PM

Effect of Dislocations on Thermal Conductivity of UO₂: *Bowen Deng*¹; Aleksandr Chernatynskiy¹; Priyank Shukla²; Susan Sinnott¹; Simon Phillpot¹; ¹University of Florida; ²Georgia Institute of Technology

2:45 PM

Radiation-Enhanced Diffusivity Measurements of Nd in Single Crystal Thin Film UO₂: *Xiaochun Han*¹; Brent Heuser¹; ¹University of Illinois

3:00 PM

Thermal Properties of ThO₂-Based Fuel Using Atomic Level Simulations: *Rakesh Behera*¹; Aleksandr Chernatynskiy²; Simon Phillpot²; Chaitanya Deo¹; ¹Georgia Institute of Technology; ²University of Florida

3:15 PM

Thermal Transport in Uranium Dioxide from First Principles: *Aleksandr Chernatynskiy*¹; Simon Phillpot¹; ¹University of Florida

3:30 PM Break

3:40 PM Invited

Simulation of the Pellet Cladding Interaction Phenomenon with the PLEIADES Fuel Performance Software Environment: *Bruno Michel*¹; Chrystelle Nonon¹; Jerome Sercombe¹; Frederic Michel¹; Vincent Marelle¹; Isabelle Ramiere¹; ¹CEA

4:10 PM Invited

Mechanistic Modeling of Fuel Microstructure Evolution and Fission Product Release under Irradiation: *Mikhail Veshchunov*¹; ¹Nuclear Safety Institute (IBRAE) of Russian Academy of Sciences

4:40 PM

Theoretical Investigation on Interplay of Defect Clusters and Fission Gas in Uranium Dioxide: *Ying Chen*¹; Hua Y Geng²; Yasunori Kaneta³; Motoyasu Kinoshita⁴; Shuichi Iwata³; ¹Tohoku University; ²Institute of Fluid Physics; ³The University of Tokyo; ⁴Central Research Institute of Electric Power Industry

4:55 PM

Microstructurally Explicit Multi-Physics Simulation of Intergranular Mass Transport in Oxide Nuclear Fuels: *Harn Chyi Lim*¹; Karin Rudman¹; Kapil Krishna¹; Robert McDonald¹; Pedro Peralta¹; Chris Stanek²; Kenneth McClellan²; ¹Arizona State University; ²Los Alamos National Lab

5:10 PM

Potential Performance Improvements of New Fuels: Ed Lahoda¹; *Peng Xu*¹; Sumit Ray¹; Lars Hallstadius¹; ¹Westinghouse Electric Company

5:25 PM Concluding Comments

Randall M. German Honorary Symposium on Sintering and Powder-Based Materials: Powder Processing and Consolidation III

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: K. Morsi, San Diego State University; Fernand Marquis, Naval Postgraduate School; John Meyer, Iowa State University; Ahmed El-Desouky, San Diego State University; Eugene Olevsky, San Diego State University

Wednesday PM
March 14, 2012

Room: Oceanic 2
Location: Dolphin Resort

Session Chair: J. Sears, South Dakota School of Mines & Technology

2:00 PM

LASER Powder Deposition of AlMgB14-TiB2 Ultra-Hard Coatings on Titanium, Steel, and Cast Iron Substrates: *Jacob Fuerst*¹; Michael Carter¹; James Sears¹; ¹South Dakota School of Mines and Technology

2:15 PM

Pre-Sintered Preforms - Applications for Gas Turbine Components: *Jeremy Boyle*¹; ¹AIM MRO

2:30 PM

Modeling of Compaction Behavior Al6061 and SiC Powder by Semi-Solid Powder Forming: Yufeng Wu¹; *Gap-Yong Kim*¹; ¹Iowa State University

2:45 PM

Novel Amalgams for In-Space Fabrication of Replacement Parts: Calvin Cochran¹; *James Van Hoose*²; Richard Grugel³; ¹Hendrix College; ²Qualis/Jacobs; ³Marshall Space Flight Center

3:00 PM

Role of Al-Si Eutectic Powder on Sintering Aspects of Aluminum Alloy: *Gaurav Gupta*¹; Anish Upadhaya²; O.P. Modi¹; ¹AMPRI bhopal; ²IIT Kanpur

3:15 PM Break

3:35 PM

Characterization of Surface Oxides on Steel Powders – Experiments and Modelling: *Karin Frisk*¹; Sophie Caddeo Johansson¹; Alexander Angré¹; ¹Swerea KIMAB

3:50 PM

Corrosion Resistant Austenitic (316L) Stainless Steel through Sintering and Surface Modification by Electrostatic Spray Coating: *Kandala Ramakrishna*¹; Kantesh Balani¹; Anish Upadhaya¹; ¹Indian Institute of Technology



TMS 2012

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4:05 PM

Intense Pulsed Light Sintering Technique for Nanomaterials: *H. A. Colorado*¹; S. R. Dhage²; J. M.¹; H. T.¹; ¹University of California, Los Angeles; ²International Advanced Research Center for Powder Metallurgy & New Materials (ARCI)

4:20 PM

Reactive Spark Plasma Sintering of AlON Ceramics: *Halide Esra Kanbur*¹; Burcu Apak¹; Gultekin Goller¹; Onuralp Yucel¹; Filiz Cinar Sahin¹; ¹Istanbul Technical University

4:35 PM

Spark Plasma Sintering of Silicon Carbide Ceramics: *Mehtap Unlu*¹; Gultekin Goller¹; Onuralp Yucel¹; Filiz Sahin¹; ¹Istanbul Technical University

4:50 PM Invited

Progress in Additive Manufacturing as a Powder Based Solution: *James Sears*¹; ¹South Dakota School of Mines & Technology

Reaching New Heights: Materials Innovation in the Aerospace Industry: Session I

Sponsored by:

Program Organizers: Robert Shull, National Institute of Standards and Technology; Jud Ready, Georgia Institute of Technology; George Gray, Los Alamos National Laboratory; Thomas Battle, Midrex Technologies

Wednesday PM
March 14, 2012

Room: Northern E2
Location: Dolphin Resort

Session Chair: Chuck Ward, US Air Force

2:00 PM Introductory Comments

2:05 PM

Materials Genome Initiative: *James Warren*¹; ¹NIST

2:15 PM

ICME: Promise and Future Directions: *Robert Schafrik*¹; ¹GE Aviation

2:45 PM

Lessons Learned from the Trenches and Implications on ICME and the MGI: *Charles Kuehmann*¹; ¹QuesTek Innovations LLC

3:15 PM

Enabling the Era of Hybrid Materials - A Tipping Point of Change: *Michael Dudzik*¹; Rick Barto¹; ¹Lockheed Martin Corporation

Recent Developments in Biological, Electronic, Functional and Structural Thin Films and Coatings: Process-Properties-Performance Correlations II

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Jian Luo, Clemson University; Xing Yang (Mark) Liu, National Research Council Canada; Nancy Michael, University of Texas at Arlington; Roger Narayan, University of North Carolina and North Carolina State University; Choong-un Kim

Wednesday PM
March 14, 2012

Room: Swan 10
Location: Swan Resort

Session Chairs: Jian Luo, Clemson University; Choong-un Kim, University of Texas at Arlington

2:00 PM Introductory Comments

2:05 PM

Near-Surface Residual Stress-Profiling by Incremental Micro-Slot Cutting Method: Assessment of Stress-Calculation Errors: *Bartlomiej Winiarski*¹; Philip Withers¹; ¹University of Manchester

2:35 PM

Properties of Coatings Formed by Plasma Electrolytic Oxidation of AM60B Magnesium Alloy in Electrolytes Containing Al₂O₃ Suspension: *Xijin Li*¹; *Mark Liu*¹; Ben Luan¹; ¹National Research Council Canada

3:05 PM

Adhesion between Polymer/Metal interfaces: *Sina Youssefian*¹; Nima Rahbar¹; ¹Umass Dartmouth

3:25 PM

Hyperthermal Hydrocarbon Modification of PMMA: *Leah Hill*¹; Travis Kemper¹; Susan Sinnott¹; ¹University of Florida

3:45 PM Break

4:00 PM

Mechanism of Creep Deformation in Porous Organosilicate Thin Films: *Emil Zin*¹; Tingqin Zhao¹; Nancy Michael¹; Choong-Un Kim¹; Huili Xu¹; ¹The University of Texas at Arlington

4:20 PM

Characterization of Ceramic Layers on Al Alloy by Plasma Electrolytic Oxidation in Two Different Electrolytes Including Sodium Tungstate: *In Jun Hwang*¹; Ki Ryong Shin¹; Sang il Yoon¹; Young Gun Ko²; Dong Hyuk Shin¹; ¹Hanyang University; ²Yeungnam University

4:40 PM

Characterization of High Temperature Mechanical Properties of Two Unique Experimental Coatings: *Amit Pandey*¹; Vladimir Tolpygo²; Kevin Hemker³; ¹ORNL; ²Honeywell; ³JHU

5:00 PM

Effect of Temperature on the Structure and Properties of Nano-Twin Cu Thin Film Deposited by Unbalanced Magnetron (UBM) Sputtering: *Kai Hung Yang*¹; Fan-Yi Ouyang¹; ¹National Tsing Hua University

WEDNESDAY PM

5:30 PM

Formation of Crystalline and Amorphous Phases During Deposition of Ni_xTi_{1-x} Thin Film on Si Substrate – Interpretation of Experimental Results Using Molecular Dynamics Simulations: *Shampa Aich*¹; Geetha Priyadarshini B¹; M. Gupta¹; Sudipto Ghosh¹; Madhusudan Chakraborty²; ¹Indian Institute of Technology Kharagpur; ²Indian Institute of Technology Bhubaneswar

Recycling General Sessions: Waste Utilization

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee
Program Organizer: Joseph Pomykala, Alter Trading

Wednesday PM
March 14, 2012

Room: Europe 4
Location: Dolphin Resort

Session Chair: Jeffrey S. Spangenberg, Argonne National Laboratory

2:00 PM

Experimental Research on Acid Magenta Dye Decolor Dynamics: *Ding Lichao*¹; Chen Yunnen¹; Jiangxi University of Science and Technology

2:20 PM

Study on a River Containing Fluorine and the Pollution Control Method: *Luo Jianzhong*¹; Zhang Zheng¹; Guangdong University of Technology

2:40 PM

Study on a Stream Contained Fluorine Excessively and the Industry Pollution Control of Fluorine in the Stream: *Luo Jianzhong*¹; Zhang Zheng¹; Zhang Minyi¹; Zhang Qian¹; Luo Shuai¹; Guangdong University of Technology

3:00 PM

Investigation of Mo Extraction from a Spent Hydro-Cracking Catalyst by Fungi at Optimal Conditions: *Farnaz Amiri*¹; Sharif University of Technology

3:20 PM

Leaching Thermodynamics and Kinetics of Preparation of Synthetic Rutile: *Wu Zhang*¹; Li Zhangli¹; Xiang Feng¹; Northeastern University

3:40 PM Break

4:00 PM

Phase Equilibria and Liquidus in CaO-SiO₂-FeOx-Al₂O₃ System in the Temperature Range 1673K to 1873K: *Cuihuan Huang*¹; Northeastern University

4:20 PM

Precipitation Selectivity of Perovskite Phase from Ti-Bearing Blast Furnace Slag under Reducing Conditions, Argon Atmosphere and Dynamic Oxidation Conditions: Li Zhang¹; Wu Zhang¹; Northeastern University

4:40 PM

Recovery of Magnesium from Waste Effluent in Nickel Laterite Hydrometallurgy Process: *Ninglei Sun*¹; Jinshan Liu¹; Kuiting Wang¹; Aiguo Dong¹; Yeda Lu¹; China ENFI Engineering Co. Ltd.

5:00 PM

Recycling of Reverted IN738LC with Reference to Mechanical Properties and Control of Chemical Composition: *Reza Rahimi*¹; Mahmood Nili Ahmadabadi¹; University of Tehran

5:20 PM

A Kinetics Study on the Hydrometallurgical Recovery of Vanadium from LD Converter Slag in Alkaline Media: Amirhossein Shahnazi¹; Fereshteh Rashchi¹; Ehsan Vahidi²; ¹University of Tehran; ²University of South Florida

Refractory Metals 2012: Alloy Predictions and Synthesis | Oxidation and Corrosion

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: Refractory Metals Committee
Program Organizers: Eric Taleff, The University of Texas at Austin; Todd Leonhardt, Rhenium Alloys Inc; Rachel DeLucas, H.C. Starck; Gary Rozak, HC Starck Inc

Wednesday PM
March 14, 2012

Room: Mockingbird 2
Location: Swan Resort

Session Chairs: Eric Taleff, The University of Texas at Austin; Rachel DeLucas, H.C. Starck Inc.

2:00 PM

Ab Initio Phase Diagrams of Bcc-Based Transition Metal Alloys – Consequences on Properties: *Patrice Turchi*¹; Vaclav Drchal²; Josef Kudrnovsky²; ¹Lawrence Livermore National Laboratory; ²Institute of Physics, Czech Academy of Science

2:20 PM

Bond-Order Potentials for bcc Refractory Metals: *Miroslav Cak*¹; Thomas Hammerschmidt¹; Ralf Drautz¹; ICAMS, Ruhr University Bochum

2:40 PM

Effect of Alloying on Phase Stability and Deformation Behavior of Niobium Silicides: *Oleg Kontsevoi*¹; Arthur Freeman¹; Northwestern University

3:00 PM

Microstructure and Properties of New Refractory High Entropy Alloys: *Oleg Senkov*¹; Svetlana Senkova¹; Daniel Miracle²; Christopher Woodward¹; Air Force Research Laboratory

3:20 PM

Facile Synthesis and Characterization of Inexpensive Superhard Refractory Metals: *Richard Kaner*¹; Reza Mohammadi¹; Andrew Lech¹; Miao Xie¹; Christopher Turner¹; Beth Weaver¹; Michael Yeung¹; Sarah Tolbert¹; UCLA

3:40 PM Break

3:50 PM

Microstructural Characterization of Multicomponent Nb-Ti-Si-Cr-Al-X Alloys: *Raghvendra Tewari*¹; Hyo-Jin Song²; Amit Chatterjee³; Vijay Vasudevan²; Bhabha Atomic Research Centre; ²Department of Chemical and Materials Engineering, University of Cincinnati, OH, 45221-0012; ³Rolls Royce Corporation

4:10 PM

Cobalt-Base Alloys for High Temperature Applications: *Rabindra Mahapatra*¹; M. Ashraf Imam²; Charles Lei¹; Jerry Feng²; Naval Air Systems Command; ²Naval Research Lab

4:30 PM

Oxidation Behavior of Nb-Ti-Si-Cr-Al-X Based Multi-Component Based Alloys: *Raghvendra Tewari*¹; Amit Chatterjee²; F. J. Boerio³; Vijay Vasudevan²; Bhabha Atomic Research Centre; ²Rolls Royce Corporation; ³University of Cincinnati



TMS 2012

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4:50 PM

Oxidation Behavior of the Nb-10Si-20Cr and Nb-10Si-20Cr-5Al Systems: *Victoria Rangel*¹; S.K. Varma²; ¹The University of Texas at El Paso ; ²The University of Texas at El Paso

5:10 PM

The Effects of Silicon on the Nb-Cr-Si Alloy System: *Daniel Voglewede*¹; S. Varma¹; ¹University of Texas at El Paso

Solid-State Interfaces II: Toward an Atomistic-Scale Understanding of Structure, Properties, and Behavior through Theory and Experiment: Grain-boundaries and Triple Junctions

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Xiang-Yang Liu, Los Alamos National Lab; Douglas Spearot, University of Arkansas; Guido Schmitz, University of Münster; David Seidman, Northwestern University

Wednesday PM
March 14, 2012

Room: Oceanic 7
Location: Dolphin Resort

Funding support provided by: Los Alamos National Laboratory

Session Chairs: Guido Schmitz, University of Münster, Germany; Reiner Kirchheim, University of Göttingen, Germany

2:00 PM Invited

Thermodynamics and Kinetics of Grain Boundary Junctions: *Günter Gottstein*¹; Lasar Shvindlerman¹; Luis Barrales-Mora¹; Bingbing Zhao¹; ¹RWTH Aachen University

2:30 PM Invited

Interfaces, Grain Boundaries and Triple Junctions in Metallic Multilayers: *Zoltán Balogh*¹; Patrick Stender¹; Mohammed Chellali¹; Guido Schmitz¹; ¹Westfälische Wilhelms Universität, Münster

3:00 PM

Grain Boundary Junction Transitions during Annealing of a Model Columnar Microstructure: *James Belak*¹; Bryan Reed¹; Vasily Bulatov¹; Ming Tang¹; Tom Lagrange¹; Joel Bernier¹; Mukul Kumar¹; ¹Lawrence Livermore National Laboratory

3:20 PM

Effect of Three-Dimensional Grain Boundary Structure, Crystallography and Chemistry on Sensitization in Al-Mg Alloys: *Alexis Lewis*¹; Keith Knipling¹; ¹Naval Research Laboratory

3:40 PM Break

3:50 PM Invited

The Disconnection Mechanism of Coupled Migration and Shear at Grain Boundaries: *Robert Pond*¹; Hassan Khater²; Anna Serra²; John Hirth³; ¹University of Exeter; ²Universitat Politècnica de Catalunya; ³Private individual

4:20 PM

Geometrical construction of $90^\circ \sqrt{3}$ (hk0) Quasi-periodic Grain Boundaries in Cubic Crystals: *Mohammad Shamsuzzoha*¹; ¹University of Alabama

4:40 PM

Observations and Trends of Shear-Coupled Grain Boundary Motion: *Eric Homer*¹; Stephen Foiles²; Elizabeth Holm²; David Olmsted³; ¹Brigham Young University; ²Sandia National Laboratories; ³University of California, Berkeley

5:00 PM

Surface Effects and Resolving Apparent Inconsistencies in Grain Migration Rate Measurements in Aluminum: *Arkady Vilenkin*¹; ¹The Hebrew University of Jerusalem

5:20 PM

Stress Induced Migration of Symmetric Tilt Grain Boundaries in Zinc: *Askar Sheikh-Ali*¹; ¹Kazakh-British Technical University

Symposium in Memory of Patrick Veyssièrè: Understanding the Mechanisms Controlling Plastic Flow: Deformation Mechanisms

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division

Program Organizers: Georges Saada, LEM CNRS ONERA; Dennis Dimiduk, Air Force Research Laboratory; Hael Mughrabi, University Erlangen-Nuernberg; Haruyuki Inui, Kyoto University

Wednesday PM
March 14, 2012

Room: Europe 6
Location: Dolphin Resort

Funding support provided by: National Science Foundation

Session Chairs: M. Véron, Phelma; K. Hemker, John Hopkins University

2:00 PM Invited

Deformation Mechanisms in B2 Intermetallic CoTi: *Rupalee Mulay*¹; Sean Agnew¹; ¹University of Virginia

2:30 PM Invited

Development of a Crystal Model for Twinning in Tantalum: *Jeffrey Florando*¹; Nathan Barton¹; James McNaney¹; Luke Hsiung¹; Mukul Kumar¹; ¹Lawrence Livermore National Laboratory

3:00 PM Invited

Nucleation Versus Propagation of Deformation Twins in Tantalum Driven by High Shear Strain Rate at Low Temperature: *Changqiang Chen*¹; Kalliat Ramesh¹; Kevin Hemker¹; Mukul Kumar²; Jeff Florando²; ¹Johns Hopkins University; ²Lawrence Livermore National Laboratory

3:30 PM Invited

Laser Shock Induced Changes in Microstructure, Residual Stress, Plasticity and Properties of Aero Engine and Other Alloys: Amrinder Gill¹; Yixiang Zhao¹; Abhishek Telang¹; Zhong Zhou¹; Seetha Mannava¹; Dong Qian¹; *Vijay Vasudevan*¹; ¹University of Cincinnati

3:50 PM Break

4:05 PM Invited

A Comparison of Dislocation Microstructures Formed during Severe Plastic Deformation of an Al-2.5 Mg Alloy at Room and Cryogenic Temperatures and Their Effect on Alloy's Room-Temperature Strength: *Jung Singh*¹; Apu Sarkar¹; Garima Sharma¹; Jayanta Chakravarty¹; ¹Bhabha Atomic Research Centre

4:25 PM Invited

Relationship between Plasticity Mechanism and "Multiple-Slip" Volume in FCC Metals at Nanoscale: *Qing-Jie Li*¹; Zhang-Jie Wang¹; Zhi-Wei Shan¹; Ju Li²; Jun Sun¹; Evan Ma³; ¹Center for Advancing Materials Performance from the Nanoscale (CAMP-Nano) & Hysitron Applied Research Center in China (HARCC), State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University; ²Department of Nuclear Science and Engineering and Department of Materials Science and Engineering, MIT; ³Department of Materials Science and Engineering, Johns Hopkins University

WEDNESDAY PM

4:45 PM Invited

Direct and Derived Dislocation Density Vectors: *Craig Hartley*¹; ¹El Arroyo Enterprises LLC

5:05 PM Concluding Comments

Titanium: Advances in Processing, Characterization and Properties: Mechanical Properties

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Christopher Szczepanski, US Air Force Research Laboratory; Vasisht Venkatesh, Pratt & Whitney

Wednesday PM
March 14, 2012

Room: Oceanic 3
Location: Dolphin Resort

Session Chairs: Soran Biroscu, University of Cambridge; Chris Szczepanski, US Air Force Research Laboratory

2:00 PM Invited

Crack Initiation and Microstructurally Short Crack Growth of Ti-6Al-4V: *Hans-Juergen Christ*¹; Helge Knobbe¹; Philipp Koester¹; Claus-Peter Fritzen¹; Martin Riedler²; ¹University of Siegen; ²Böhler Schmiechetechnik GmbH & Co KG

2:30 PM Invited

Computational Indicators for Structure-Fatigue Property Relations in Ti Alloys: *Craig Przybyla*¹; *David McDowell*²; ¹AFRL; ²Georgia Institute of Technology

3:00 PM Invited

Hierarchy of Fatigue Deformation Heterogeneities in a Titanium Alloy: A Pathway for Predicting Life-Limiting Failures: *Sushant Jha*¹; Robert Brockman²; Christopher Szczepanski³; Craig Przybyla³; James Larsen³; ¹Air Force Research Laboratory/Universal Technology Corporation; ²University of Dayton Research Institute; ³US Air Force Research Laboratory

3:30 PM

In-Situ Microscale Testing to Evaluate Fatigue Behavior: *Christopher Szczepanski*¹; Sushant Jha²; Paul Shade¹; Robert Wheeler³; James Larsen¹; ¹US Air Force Research Laboratory; ²AFRL/UTC; ³UES

3:50 PM Break

4:00 PM

Analysis of Dislocation Structures Underneath Nanoindenters in an α -Ti Alloy: *J. Kwon*¹; P.Sudharshan Phani²; M.C. Brandes¹; A. Pilchak³; E.P. George⁴; G.M. Pharr²; M.J. Mills¹; ¹The Ohio State University; ²The University of Tennessee; ³WPAFB; ⁴Oak Ridge National Laboratory

4:20 PM

Three-dimensional Investigation of the Microtexture near Tensile Crack Tip in Ti-6Al-4V: Xu Xu¹; *Yau Yau Tse*¹; Geoff West¹; ¹Loughborough University

4:40 PM

The Effect of Temperature and Stress on the Creep Deformation Modes of Ti-5Al-2.5Sn (wt.%): *Hongmei Li*¹; Carl Boehlert¹; Thomas Bieler¹; Martin Crimp¹; ¹Michigan State University

5:00 PM

Comparison of CPFE and Experimental Results for the Study of Interaction between Grain Boundary and Dislocation Slip in Ti-5Al-2.5Sn: *Chen Zhang*¹; Hongmei Li¹; James Seal¹; Martin Crimp¹; Carl Boehlert¹; Thomas Bieler¹; ¹Michigan State University

5:20 PM

Machining of Coarse Grained and Ultra Fine Grained Titanium: *Rimma Lapovok*¹; Andrey Molotnikov¹; Ashan Bandaranayake¹; Yuri Estrin¹; ¹Monash University

5:40 PM

Machinability of β -Titanium Alloy Ti-10V-2Fe-3Al with Different Microstructures: *Hendrik Abrahams*¹; Christian Machai¹; Dirk Biermann¹; ¹Technische Universität Dortmund

6:00 PM

Residual Stress Relaxation Effects on the Cracking and Wear Processes of Shot Peened Ti-6Al-4V Titanium Alloy under Fretting-Fatigue Loading: *Romain Ferre*¹; Siegfried Fouvry²; Bruno Berthel²; Rémi Amargier¹; Antoine Ferre²; ¹SNECMA; ²Laboratoire de tribologie et Dynamique des Systèmes (LTDS)

T.T. Chen Honorary Symposium on Hydrometallurgy, Electrometallurgy and Materials Characterization: Processing and Properties I

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee

Program Organizers: Shijie Wang, Rio Tinto Kennecott Utah Copper; J. E. Dutrizac, CANMET; Michael Free, University of Utah; J. Y. Hwang, Michigan Technological University; Daniel Kim, Rio Tinto Kennecott Utah Copper

Wednesday PM
March 14, 2012

Room: Oceanic 5
Location: Dolphin Resort

Funding support provided by: Rio Tinto Kennecott Utah Copper, ASARCO, and Freeport McMoRan

Session Chair: Shijie Wang, Rio Tinto Kennecott Utah Copper

2:00 PM

Selecting the Right Filter Media for the Application: *William Wilkie*¹; Robert Boller¹; ¹Sefar Inc.

2:20 PM

Thermodynamic Study for Removal of Phosphorus from Molten Silicon: *Takashi Nagai*¹; Hideaki Sasaki¹; Masafumi Maeda¹; ¹The University of Tokyo

2:40 PM

Fatigue and Fracture Mechanics Characterization of Advanced Automotive Steels: Paolo Matteis¹; Giorgio Scavino¹; *Donato Firrao*¹; ¹Politecnico di Torino

3:00 PM

Kinetic and Thermochemical Analysis of Rubidium Jarosite Decomposition in Alkaline Media: *Miguel Perez-Labra*¹; Antonio Romero-Serrano²; Eleazar Salinas-Rodriguez¹; Erika Avila-Davila³; Guillermo Juarez-Lopez⁴; Juan Hernandez-Avila¹; ¹AACTYM UAEH; ²IPN MEXICO; ³Instituto Tecnológico de Pachuca; ⁴Centro de Investigaciones en Nuevos Materiales Universidad Tecnológica de la Mixteca

3:20 PM Break

3:40 PM

Phase Equilibrium and Characterization Studies of Binary Organic Thermal Energy Storage Materials: *Wen-Ming Chien*¹; Ivan Gantan¹; Amrita Mishra¹; Dhanesh Chandra¹; Vamsi Kamisetty¹; Prathyusha Mekala¹; ¹University of Nevada, Reno



TMS 2012

141st Annual Meeting & Exhibition

4:00 PM

Laboratory Test Works and Plant Trials for Milling and Flotation of Slow Cooled Copper Slag: *Pengfu Tan*¹; ¹Xstrata Copper

4:20 PM

An Experimental Study of Chemical Oxygen Demand Removal from the Coking Wastewater Using Three-Dimensional Electrode Reactor: *Lei Zhang*¹; Gai-Feng Xue¹; J.Y Hwang¹; ¹WISCO

4:40 PM

Behavior of Various Impurities during the Precipitation of Hematite from Ferric Sulphate Media at 225°C: *John Dutrizac*¹; Tzong Chen¹; ¹CANMET-MMSL

5:00 PM

New Process for Granulation of Red Mud and Its Physical Property Assessment: Shuai-Dan Lu¹; *Shaohua Ju*¹; Jin-Hui Peng¹; Sheng-Hui Guo¹; Ya-Jian Wang¹; Lei Guo¹; ¹Kunming University of Science and Technology

Ultrafine Grained Materials VII: Young Scientist

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee

Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Xiaoxu Huang, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; Hyoung Seop Kim, POSTECH; Terence Langdon, University of Southern California; Terry Lowe, Manhattan Scientifics, Inc.; Ruslan Valiev, Ufa State Aviation Technical University; Xiaolei Wu, Institute of Mechanics, Chinese Academy of Sciences; Michael Zehetbauer, University of Vienna

Wednesday PM
March 14, 2012

Room: Swan 5
Location: Swan Resort

Session Chairs: Justin Scott, Institute for Defense Analysis; Matthias Hockauf, Chemnitz University of Technology; Suveen Mathaudhu, U.S. Army Research Office; Yuntian Zhu, North Carolina State University

2:00 PM

3D-Architecturing Aluminium Sheets by ARB Processing with Graded Copper Particle Reinforcement: *Christian W. Schmidt*¹; Mathis Ruppert¹; Patrick Knödler¹; Heinz Werner Höppel¹; Mathias Göken¹; ¹Friedrich-Alexander-Universität Erlangen-Nürnberg

2:15 PM

Advantageous Anisotropy: Designed Performance in Mg Alloy: *David Foley*¹; Sonia Modarres-Razavi¹; Suveen Mathaudhu²; Laszlo Kecskes³; Ibrahim Karaman¹; K. Hartwig¹; Vince Hammond³; ¹Texas A&M University; ²US Army Research Office; ³US Army Research Laboratory

2:30 PM

Analysis of Microstructure and Microhardness of Zr-2.5%Nb Processed by High Pressure Torsion (HPT): *Mychelle Comphanoni*¹; Jose Matheus¹; Andre Pinto²; ¹Military Institute of Engineering (IME); ²Brazilian Center for Physics Research (CBPF)

2:45 PM

Combining Extrusion and ECAP – an Efficient Processing Route for Large Scale UFG Materials: *Philipp Frint*¹; Matthias Hockauf¹; Thorsten Halle¹; Gernot Strehl²; Martin F.-X. Wagner¹; Thomas Lampke¹; ¹Chemnitz University of Technology; ²S+C Extrusion Tooling GmbH

3:00 PM

Consolidation of Nanostructured Copper and Copper Based Alloys via High Pressure Torsion: *Hamed Bahmanpour*¹; Daria Setman²; Jelena Horky²; Michael Kerber²; Susi Kahofer²; Suhrit Mula¹; Michael Zehetbauer²; Ronald Scattergood¹; Carl Koch¹; ¹North Carolina State University; ²Faculty of Physics, University of Vienna

3:15 PM

Effects of Post Process Treatments on the Mechanical Stability of Rolled Nanostructured Aluminum: *Jacob Kidmose*¹; Lei Lu²; Grethe Winther¹; Niels Hansen¹; Xiaoxu Huang¹; ¹Risø DTU; ²Institute of Metal Research

3:30 PM

Nanoindentation Analysis for Local Properties of Ultrafine Grained Copper Processed by High Pressure Torsion: *Hyeok Jae Jeong*¹; Eun Yoo Yoon¹; Nack Joon Kim²; Hyeong Seop Kim¹; ¹Department of Materials Science and Engineering, POSTECH, Korea; ²Graduate Institute of Ferrous Technology, POSTECH, Korea

3:45 PM Break

4:00 PM

Strengthening of Al through Addition of Fe and by Processing with High-Pressure Torsion: *Jorge Cubero-Sesin*¹; Zenji Horita¹; ¹Kyushu University

4:15 PM

Structural Parameters and Strengthening Mechanisms in Cold-Drawn Pearlitic Steel Wires: *Xiaodan Zhang*¹; Andy Godfrey²; Xiaoxu Huang³; Niels Hansen³; ¹Tsinghua University, Risø DTU; ²Tsinghua University; ³Risø DTU

4:30 PM

Study of Grain Boundary Weakening using In-Situ Synchrotron X-Ray Diffraction of Ultrafine Grained Materials: *Jennifer Girard*¹; Jihua Chen¹; Helen Couvy²; Xiaoyang Liu³; ¹Florida International University; ²University of Michigan; ³Jilin University

4:45 PM

Understanding the Ultrafine Grain Formation and Recrystallization Mechanisms in Magnesium through Extrusion-Machining: *Mert Efe*¹; Dinakar Sagapuram¹; Wilfredo Moscoso²; Srinivasan Chandrasekar¹; Kevin Trumble¹; ¹Purdue University; ²Pontificia Universidad Catolica Madre y Maestra

5:00 PM

Reinforcement Phase Size Effects on a Cryomilled Al – B₄C Nanocomposite: *Henry Yang*¹; Troy Topping¹; Zhihui Zhang¹; Enrique Lavernia¹; Julie Schoenung¹; ¹University of California Davis

5:15 PM

Homogenizing Process and Strain Hardening Behavior of a Two-Phase Cu-Ag Alloy Processed by High-Pressure Torsion (HPT): *Y.Z. Tian*¹; Z.F. Zhang¹; R.B. Figueiredo²; N. Gao³; T.G. Langdon⁴; ¹Institute of Metal Research, Chinese Academy of Sciences; ²Federal University of Minas Gerais; ³University of Southampton; ⁴University of Southern California

5:30 PM

Microhardness and Microstructural Evolution in Cu-Zr Alloy after High-Pressure Torsion Processing: *Jitraporn Wongsang-Ngam*¹; Megumi Kawasaki¹; Terence Langdon¹; ¹University of Southern California

WEDNESDAY PM

Ultrasonic Fatigue of Advanced Materials and Systems: Ultrasonic Fatigue of Metals and Alloys II; Very High Cycle Fatigue of Composites and MEMS

Sponsored by: The Minerals, Metals and Materials Society, State Research Center for Mathematical and Computational Modelling, University of Kaiserslautern, Germany, State Research Focus "Advanced Materials Engineering", University of Kaiserslautern, Germany, TMS Light Metals Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Materials Characterization Committee, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Young Leaders Committee
Program Organizers: Frank Balle, University of Kaiserslautern; Dietmar Eifler, University of Kaiserslautern; Guntram Wagner, University of Kaiserslautern

Wednesday PM
March 14, 2012

Room: Europe 1
Location: Dolphin Resort

Session Chairs: J. Wayne Jones, University of Michigan (USA); Hans-Juergen Christ, University of Siegen (Germany)

2:00 PM

Very High Cycle Fatigue (VHCF) Behavior of Sn-Rich (Pb-Free) Solder Joints: *Martina Zimmermann*¹; Kyle Yazzie²; Martin Cremer¹; Hans-Juergen Christ¹; Nikhilesh Chawla²; ¹Universitaet Siegen; ²Arizona State University

2:20 PM

Ultrasonic Fatigue of Ti6Al4V in the Very High Cycle Fatigue Regime: Stefan Heinz¹; Guntram Wagner¹; Frank Balle¹; *Dietmar Eifler*¹; ¹University of Kaiserslautern

2:40 PM Invited

Combining Ultrasonic Fatigue with Synchrotron X-radiography and in situ Nonlinear Ultrasonic Measurements to Detect Crack Initiation: *Naji Hussein*¹; Clinique Brundidge¹; Anish Kumar¹; Tresa M. Pollock¹; J. Wayne Jones¹; ¹University of Michigan

3:00 PM

In-Situ Characterization of the Damage Evolution of Welded Aluminum Alloy Joints during Very High Cycle Fatigue (VHCF) with Nonlinear Ultrasonic Technique: *Martin Cremer*¹; Martina Zimmermann¹; Hans-Jürgen Christ¹; ¹University Siegen

3:20 PM Break

3:40 PM

Ultrasonic Fatigue of Aluminum Matrix Composites (AMC) in the VHCF-Regime: *Guntram Wagner*¹; Matthias Wolf¹; Dietmar Eifler¹; ¹University of Kaiserslautern

4:00 PM

Ultrasonic Fatigue Testing System Combined with Nondestructive Online Testing for Carbon Fiber Reinforced Composites: *Frank Balle*¹; Daniel Backe¹; Thomas Helfen²; Ute Rabe²; Sigrun Hirsekorn³; Dietmar Eifler¹; Christian Boller²; ¹University of Kaiserslautern; ²Saarland University; ³Fraunhofer Institute for Nondestructive Testing, Saarbrücken, Germany

4:20 PM

Small-Scale Multiaxial Fatigue Experiments in the Very High Cycle Regime: *Thomas Straub*¹; Tobias Kennerknecht¹; Paulin Robin²; Morgan Tort²; Geoffroy Kieffer²; Yuri Lapusta²; Christoph Eberl¹; ¹Karlsruhe Institute of Technology (KIT); ²French Institute of Advanced Mechanics (IFMA)

4:40 PM

High and Very High Cycle Fatigue in Al and Cu Thin Films on Si Substrate: *Sofie Burger*¹; Christoph Eberl¹; Alexander Siegel²; Alfred Ludwig²; Oliver Kraft¹; ¹Karlsruhe Institute of Technology; ²Ruhr-Universität Bochum

5:00 PM

Environmental Effects on Fatigue Crack Initiation in the HCF and VHCF Regimes for LIGA Ni Thin Films: Eva Baumert¹; *Olivier Pierron*¹; ¹Georgia Tech

5:20 PM Concluding Comments Dietmar Eifler, Symposium organizer

Wettability and Interfacial Phenomena between Metals and Ceramic/Refractory Materials: Session I

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, Not Applicable
Program Organizers: Martin Pech-Canul, Centro de Investigacion y de Estudios Avanzados del Instituto Politecnico Nacional; Golam Newaz, Wayne State University; Tapas Laha, Indian Institute of Technology Kharagpur; Zariff Chaudhury, Materion Corporation

Wednesday PM
March 14, 2012

Room: Macaw 1
Location: Swan Resort

Session Chairs: Martin Pech-Canul, Cinvestav Saltillo; Zariff Chaudhury, Materion Corporation; Tapas Laha, Indian Institute of Technology Kharagpur

2:00 PM

Chemical Wear of Basic Brick Linings in the Non-Ferrous Industry: *Dean Gregurek*¹; Alfred Spanring¹; Marcus Kirschen; Christian Majcenovic¹; ¹RHI AG

2:20 PM

Diffusion Bonding between Ti₃SiC₂ and NiTi Shape Memory Alloy: *Ankush Kothalkar*¹; Patrick Mahaffey¹; Sandip Basu¹; Miladin Radovic¹; Ibrahim Karaman¹; ¹Texas A&M University

2:40 PM

Effect of Surface Modification of Al₂O₃ Particles on the Microstructure and Mechanical Properties of Al-Al₂O₃ Nanocomposites: *Hossein Beygi*¹; Seyyed Abdalkarim Sajjadi¹; Seyyed Mojtaba Zebarjad¹; ¹Ferdowsi University of Mashhad

3:00 PM

Study on Wettability of Cu and 85Cu-15Ni Alloy on 18NiO-NiFe₂O₄ Composite Ceramics: *Jinjing Du*¹; Yihan Liu¹; Guangchun Yao¹; Zhigang Zhang¹; Guoyin Zu¹; ¹Northeastern University

3:20 PM

Wetting and Wicking Behavior of Refractory Coatings Used in Lost Foam Casting: *Robin Woracek*¹; Indraneel Sen¹; Dayakar Penumadu¹; ¹University of Tennessee

3:40 PM

Interfacial Reactions in the Liquid/Solid and Liquid/Vapor Interfaces of Al-Si-Mg Alloys and B12 (Bc2) Substrates: Oziel Herrera-Romero¹; *Martin Pech-Canul*¹; Zariff Chaudhury²; Golam Newaz²; ¹Centro de Investigacion y de Estudios Avanzados del Instituto Politecnico Nacional; ²Arkansas State University; ³Wayne State University



2012 Functional and Structural Nanomaterials: Fabrication, Properties, Applications and Implications: Joint Session with "2012 Surface and Heterostructures"

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Jiyoung Kim, University of Texas; David Stollberg, Georgia Tech Research Institute; Seong Jin Koh, University of Texas at Arlington; Nitin Chopra, The University of Alabama; Terry Xu, UNC Charlotte

Thursday AM Room: Pelican 1
March 15, 2012 Location: Swan Resort

Session Chair: Nitin Chopra, University of Alabama

8:30 AM Invited

Modification of Micro-Stereolithography-Fabricated Microneedles Using Pulsed Laser Deposition: Shaun Gittard¹; Philip Miller¹; Chunming Jin¹; Timothy Martin¹; Ryan Boehm¹; Bret Chisholm²; Shane Stafslie²; Justin Daniels²; Nicholas Cilz²; Nancy Monteiro-Riviere³; Adnan Nasir⁴; *Roger Narayan*¹; ¹Univ of North Carolina & North Carolina State Univ; ²North Dakota State University; ³North Carolina State University; ⁴University of North Carolina

9:05 AM

Nanosphere Lithography of Co/Pd Multilayer Film for Advanced Media: *Suzanne Kornegay*¹; Shraeyansh Thakur¹; Erica Barnes¹; Anondo Bannerjee¹; Marelly Villanueva¹; Hao Su¹; Zhenzhong Sun¹; Dawen Li¹; Subhadra Gupta¹; ¹The University of Alabama

9:20 AM

Optimization of CoPt-AlN Granular Media for High Density Applications: *Hao Su*¹; Anusha Natarajarathinam¹; Elizabeth Philip¹; Kristy Tippey¹; Subhadra Gupta¹; ¹The University of Alabama

9:35 AM

Reproducible Resistive Switching Behavior in Sputtered TiO_x Films: *R. J. Jeng*¹; W. Z. Chang¹; J. P. Chu¹; ¹National Taiwan University of Science and Technology

9:55 AM

Improving Resistance Switching Behavior of HoScO₃ Film for the RRAM Application: Effects of Annealing: *W. Z. Chang*¹; S. F. Wang²; J. P. Chu³; ¹Graduate Institute of Engineering, National Taiwan University of Science and Technology; ²Department of Materials and Minerals Resources Engineering, National Taipei University of Technology; ³Graduate Institute of Engineering and Department of Materials Science and Engineering, National Taiwan University of Science and Technology,

10:10 AM Break

10:25 AM

Environmental Cracking Susceptibility of a Surface Nanocrystallized Stainless Steel in Contrast to its Coarse Grained Counterpart: *Indranil Roy*¹; Jian Lu²; Yuntian Zhu³; Colin Longfield¹; Rashmi Bhavsar¹; Enrique Lavernia⁴; Farghalli Mohamed⁵; ¹Schlumberger; ²City University of Hong Kong; ³North Carolina State University; ⁴University of California, Davis; ⁵University of California, Irvine

10:45 AM

Investigation of Al₂O₃ Nanostructures Using Charge Optimized Many Body Potentials: *Dundar Yilmaz*¹; Bryce Divine²; Simon Phillpot¹; Susan Sinnott¹; ¹University of Florida; ²U.S. Army Engineer Research and Development Center

11:05 AM

Microstructure, Interfaces, Intermixing and Magnetic Properties of FePd/MgO/FePt/Pt/CrRu Films Deposited on SiN/Si Substrate: *Ramasis Goswami*¹; Shu Cheng²; Konrad bussmann²; ¹SAIC/Naval Research Laboratory; ²Naval Research Laboratory

11:25 AM

Fluorescence from Polymers in Uniaxially Stretched Electrospun Nanofiber Mats: *Stephen Young*¹; Indraneel Sen¹; Rohit Uppal¹; Dayakar Penumadu¹; ¹University of Tennessee, Knoxville

11:40 AM

Synthesis and Characterization of Core-Shell TaN_x Nanocomposites: Lianyun Liu¹; *Kai Huang*¹; Zheng Wang¹; Jungang Hou¹; Hongmin Zhu¹; ¹University of Science and Technology Beijing

11:55 AM Concluding Comments

3rd International Symposium on High Temperature Metallurgical Processing: Treatment and Recycling of Solid Slag/Wastes

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Energy Committee, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Patrick Masset, TU Freiberg; Onuralp Yucel, Istanbul Technical University; Rafael Padilla, University of Concepcion; Guifeng Zhou, Wuhan Iron and Steel

Thursday AM Room: Southern II
March 15, 2012 Location: Dolphin Resort

Session Chairs: Xiangxin Xue, Northeastern University; Zhiwei Peng, Michigan Technological University

8:30 AM

An Integrated Strategy for Whole Ecological Utilization of Typical Industrial Solid Wastes in China: *Xiangxin Xue*¹; He Yang¹; Tao Jiang¹; Yong Li¹; ¹Northeastern University

8:45 AM

Chlorination Behaviors of Copper Phases by Calcium Chloride in High Temperature Oxidizing-Chloridizing Roasting: *De Qing Zhu*¹; Dong Chen¹; Jian Pan¹; Tie Jun Chun¹; Guo Lin Zheng¹; Xian Lin Zhou¹; ¹Central South University

9:00 AM

Decomposition of Zinc Ferrite in Zinc Leaching Residue by Reduction Roasting with Carbon: *Mi Li*¹; Bing Peng¹; Liyuan Chai¹; Jiming Wang¹; Ning Peng¹; ¹Central South University

9:15 AM

Effect of Iron Containing Metallurgical Byproducts on Pulverized Coal Combustion Efficiency: *Zou Chong*¹; Wen Liangying¹; Zhang Shengfu¹; Bai Chenguang¹; Tan Xiuqin¹; ¹Chongqing University

9:30 AM

Effect of SiO₂ Addition on Production of Fe-Si-Mn Alloy from Adjusted Converter Slag: *Cuihuan Huang*¹; Min Chen¹; ¹Northeastern University

9:45 AM

Experimental Research on Recovery of Heavy Metals from EAF Stainless Steel Dust: *Canguo Wang*¹; Fei Jin¹; Guodong Sun¹; Mei Zhang¹; Min Guo¹; ¹University of Science and Technology Beijing

10:00 AM

Research on the Control Model of Vanadium Recovery by BOF Process Based on Neural Network: *Qingyun Huang*¹; Bing Xie¹; Yugang Li¹; Chongyang Zhao¹; ¹Chongqing University

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

Solidification of EAF Stainless Steel Dust: Bing Peng¹; Ji Peng¹; Liyuan Chai¹; *Di Yu*¹; ¹Central South University

10:40 AM

Study on Cementing Material Making with Electrolytic Manganese Residue: Wang Jia¹; *Peng Bing*¹; Chai Li-Yuan¹; Zhang Qiang¹; Liu Qin¹; ¹Central South University

10:55 AM

Utilization of BF Ash and BOF Sludge to Produce Burden of Blast Furnace: Xiulan Deng¹; Tiejun Chun¹; Jian Pan¹; ¹Central South University

11:10 AM

Study on the Desulfuration of Pyrite Cinder Pellets: Zhiyong Ruan¹; Deqing Zhu¹; Tiejun Chun¹; Jian Pan¹; *Zhao Qiang*; ¹Central South University

Aluminum Reduction Technology: Equipment

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Olivier Martin, Rio Tinto Alcan

Thursday AM
March 15, 2012

Room: Europe 1
Location: Dolphin Resort

Session Chair: René von Kaenel, KAN-NAK SA

8:30 AM

Integrated Desalination and Primary Aluminium Production: *Anders Sorhuus*¹; Geir Wedde¹; Dario Breschi¹; Guillaume Girault²; Nolwenn Favel²; ¹Alstom; ²Rio Tinto Alcan

8:50 AM

Busbar Displacement Study of Aluminum Reduction Cell: *Xiquan Qi*¹; ¹Northeastern University Engineering and Research Institute, Co., Ltd

9:10 AM

Impact of Amperage Creep on Potroom Busbars: Thermal-Mechanical Aspects: *Andre Felipe Schneider*¹; Daniel Richard¹; olivier charette¹; ¹HATCH Ltd.

9:30 AM

Effective Insulation Control Monitoring System: The CANDI™ Solution for a Safer Production: Anne-Gaëlle Hequet¹; *Serge Despinasse*¹; ¹ECL

9:50 AM Break**10:10 AM**

Potline Open Circuit Protection: *Laurent Troubat*¹; Roland Mathevon¹; Pierre Marcellin¹; Didier Lamant¹; Michel Jacon¹; Dominique Duval¹; Andy Johnston¹; ¹Rio Tinto Alcan

10:30 AM

Maximize Efficiency and Safety of Smelters through Advanced Multipurpose Simulator Solution: Anne-Gaëlle Hequet¹; *Denis Chapdelaine*¹; ¹ECL

10:50 AM

Challenges in Using Discrete Logistics as a Management Decision Tool for Aluminium Production: *Maarten Meijer*¹; Rienk Bijlsma²; Martijn Riesenkamp²; ¹Hencon; ²Systems Navigator

Aluminum Reduction Technology: Modelling I

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Olivier Martin, Rio Tinto Alcan

Thursday AM

March 15, 2012

Room: Southern III

Location: Dolphin Resort

Session Chair: Donald Ziegler, Alcoa Canada Primary Metals

8:30 AM

Current Distribution and Lorentz Field Modelling Using Cathode Designs: A Parametric Approach: *Subrat Das*¹; ¹Deakin University

8:50 AM

Electromagnetic and MHD Study to Improve Cell Performance of an End-to-End 86 kA Potline: *Amit Gupta*¹; Manoj Chulliparambil¹; Sankar Namboothiri¹; Satheesh Mani¹; Biswajit Basu¹; Jinil Janardhanan²; ¹Aditya Birla Science & Technology Company Ltd.; ²Hindalco Industries Ltd.

9:10 AM

Study on the Influences of Potline Status on the Magnetic Fields of Aluminum Reduction Cells: *Xiquan Qi*¹; ¹Northeastern University Engineering and Research Institute, Co., Ltd

9:30 AM

Modeling of Interface Wave of Electrolyte/Aluminum Melt in Aluminum Reduction Cell with Novel Cathode Structure: *Baokuan Li*¹; Fang Wang¹; Xiaobo Zhang¹; Naixiang Feng¹; ¹Northeastern University

9:50 AM Break**10:10 AM**

The Use of Vortex Method in the Analysis of Multiphase Flow in Aluminum Reduction Cells: Zhang Hehui¹; *Zhang Hongliang*¹; Li Jie¹; Xu Yujie¹; Yang Shuai¹; Lai Yanqing¹; ¹School of Metallurgical Science and Engineering, Central South University

10:30 AM

Anodic Bubble Behavior in Hall-Héroult Cells: *Kristian Etienne Einarsrud*¹; Stein Tore Johansen²; Ingo Eick³; ¹Norwegian University of Science and Technology; ²SINTEF Materials and Chemistry; ³Hydro Aluminium Deutschland GmbH

10:50 AM

Numerical Investigation of Bubble Dynamics in Aluminium Electrolytic Cells: Kaiyu Zhang¹; Yuqing Feng²; *Phil Schwarz*²; Mark Cooksey²; Zhaowen Wang³; ¹Northeastern University & CSIRO; ²CSIRO; ³Northeastern University



TMS 2012

141st Annual Meeting & Exhibition

THURSDAY AM

Battery Recycling: Session I

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Extraction and Processing Division, TMS: Energy Conversion and Storage Committee, TMS: Recycling and Environmental Technologies Committee

Program Organizers: Gregory Krumdick, Argonne National Laboratory; Linda Gaines, Argonne National Laboratory

Thursday AM

March 15, 2012

Room: Europe 4

Location: Dolphin Resort

Session Chairs: Gregory Krumdick, Argonne National Laboratory; John Sullivan, Argonne National Laboratory

8:30 AM Introductory Comments

8:35 AM

Economic and Environmental Trade-Offs for Li-Based Battery Recycling: *Gabrielle Gaustad*¹; Matthew Ganter¹; Xue Wang¹; Chelsea Bailey¹; Callie Babbitt¹; Brian Landi¹; ¹Rochester Institute of Technology

9:00 AM

Impacts of the Manufacturing and Recycling Stages on Battery Life Cycles: *John Sullivan*¹; Jennifer Dunn¹; Michael Barnes¹; Linda Gaines¹; ¹Argonne National Laboratory

9:25 AM

Battery Recycling by Hydrometallurgy: Evaluation of Simultaneous Treatment of Several Cell Systems: *Carlos Nogueira*¹; Fernanda Margarido²; ¹LNEG; ²IST - Instituto Superior Técnico (TULisbon)

9:50 AM

Hydrometallurgical Process for Manufacturing of Cathode Active Materials from Spent Lithium Ion Battery Packs in Used Hybrid Electric Vehicles: *Soo-Kyung Kim*¹; Jeongsoo Sohn¹; Kang-In Rhee¹; ¹Korea Institute of Geoscience and Mineral Resources

10:15 AM Break

10:25 AM

Recycling Yearly Up to 7,000 Tons of Rechargeable Batteries: *Mark Caffarey*¹; ¹Umicore USA

10:50 AM

The Use of Liquid-Liquid Extraction and Electroplating to Metals Recovery from Spent Batteries: *Kellie Provazi*¹; Denise Espinosa¹; Jorge Tenório¹; ¹University of São Paulo

11:15 AM

Distribution Logistics and Proper Disposal of Batteries for Downhole Oilfield Operations: *Amit Mohan*¹; Indranil Roy¹; David Wang¹; Ryan Davies¹; Jack Booker¹; ¹Schlumberger

11:40 AM Concluding Comments

Biological Materials Science Symposium: Bio-Inspired Materials: Implants and Devices

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee

Program Organizers: Nima Rahbar, University of Massachusetts Dartmouth; Candan Tamerler, University of Washington; Po-Yu Chen, University of California, San Diego; Molly Gentleman, Texas A&M University

Thursday AM

March 15, 2012

Room: Swan 7

Location: Swan Resort

Session Chairs: Nima Rahbar, University of Massachusetts Dartmouth; James Guest, John Hopkins University

8:30 AM Keynote

Structural Testing at the Micro and Nano Scales: Breaking Invisible Specimens with Zero Force: *Roberto Ballarini*¹; ¹University of Minnesota

9:10 AM

Nanoengineering of Implant Surfaces for Enhanced Biointegration: *Fereydoon Namavar*¹; Renat Sabirianov²; Alexander Rubinstein¹; Geoffrey Thiele¹; Laura Koepsell¹; John Sharp¹; Roxanna Namavar¹; Hani Haider¹; Kevin Garvin¹; ¹University of Nebraska Medical Center; ²University of Nebraska - Omaha

9:30 AM

New In Vitro and In Vivo Approaches in Evaluating Bioabsorbable Metal Candidates for Stents: *Jeremy Goldman*¹; Patrick Bowen¹; Jesse Gelbaugh¹; Jessica Rhadigan¹; Jon Stinson²; Heather Getty²; *Jaroslav Drellich*¹; ¹Michigan Technological University; ²Boston Scientific Corporation

9:50 AM

Investigation of Structure-Mechanical Property Relationship of Porous Titanium and Titanium Alloys: *Ziya Esen*¹; Sakir Bor²; ¹Cankaya University; ²Middle East Technical University

10:10 AM Break

10:15 AM Invited

Design of Biomaterials – Achieving Targeted Properties and Manufacturability with Topology Optimization: *James Guest*¹; ¹Johns Hopkins University

10:40 AM

Investigation of Sr and Ca Containing Mg Alloys for Biodegradable Implant Applications: Harpreet Brar¹; *Ida Berglund*¹; Benjamin Keselowsky¹; Malisa Sarntinoranont¹; Michele Manuel¹; ¹University of Florida

11:00 AM

The Effect of Sr and Ca on Corrosion Behavior of Magnesium as Biodegradable Implant: *Mandana Bornapour*¹; Mihriban Pekguleryuz¹; ¹McGill University

11:15 AM

Chemotherapy-Induced Surface Degradation and Thrombogenicity of Intravascular Catheters: A Preliminary In-Vitro Study with Focus on Breast Cancer: *Minoo Arzpeima*¹; Annika Rosén¹; Emma Strömberg¹; Javier Sanchez²; Gunilla Björling²; Sigbritt Karlsson¹; *Ragnhild. E Aune*³; Samuel Rotstein²; ¹Royal Institute of Technology; ²Karolinska Institute; ³Norwegian University of Science and Technology (NTNU)

11:30 AM

LASER Powder Deposition of Titanium - Tantalum Alloys Surfaces for Use in Biomedical and Corrosion Resistant Applications: *Jacob Fuerst*¹; Michael Carter¹; Dana Medlin¹; James Sears¹; ¹South Dakota School of Mines and Technology

11:45 AM

In Vivo Osseointegration of Nano-Designed Composite Coatings on Titanium Implants: *Sybille Facca*¹; Debrupa Lahiri²; Florence Fioretti³; Nadia Messadeq⁴; Didier Mainard⁵; Nadia Benkirane-Jessel³; Arvind Agarwal²; ¹FIU; ²FIU; ³INSERM U977; ⁴IGBMC; ⁵CNRS UMR 7561

Bulk Metallic Glasses IX: Mechanical and Other Properties

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

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

Thursday AM
March 15, 2012

Room: Swan 6
Location: Swan Resort

Session Chairs: Paul Voyles, University of Wisconsin, Madison; Jian Xu, Institute of Metal Research, Chinese Academy of Sciences

8:30 AM Invited

Structure and Relaxation of Zr-Cu-Al Bulk Metallic Glass from Hybrid Reverse Monte Carlo Modeling of Fluctuation Electron Microscopy Data: *Paul Voyles*¹; Jinwoo Hwang¹; Zenon Melgarejo¹; Don Stone¹; Ilkay Kalay²; Matt Kramer²; ¹University of Wisconsin, Madison; ²Iowa State University

8:50 AM

Evaluation of Microstructure and Mechanical Behavior of Cu Based Bulk Metallic Glass-Carbon Nanotube Composites: *Jonathan Nguyen*¹; Troy Topping¹; Hidemi Kato²; Yizhang Zhou¹; Enrique Lavernia¹; ¹University of California, Davis; ²Tohoku University

9:00 AM Invited

Oxidation Resistance of Zr- and Ti- Based Bulk Metallic Glasses in the Supercooled Liquid Region: Ka Ram Lim¹; Sung Hyun Park¹; Min Young Na¹; Se Yun Kim²; Sang Soo Jee²; Eun-Sung Lee²; Won Tae Kim³; *Do Hyang Kim*¹; ¹Yonsei University; ²Samsung Advanced Institute of Technology; ³Cheongju University

9:20 AM

Study of Plastic Deformation in Structural Modified Zr-Cu-Al Metallic Glasses by Broadband Nanoindentation Creep: *Zenon Melgarejo*¹; Jinwoo Hwang¹; Chuan Zhang¹; Joseph Jakes²; Eren Kalay³; Matt Kramer³; Paul Voyles¹; Donald Stone¹; ¹University of Wisconsin-Madison; ²Performance Enhanced Biopolymers, United States Forest Service, Forest Products Laboratory; ³Iowa State University

9:30 AM Invited

Potential Energy Landscape of Glasses: Distributions of Activation Energies, Volumes and Attempt Frequencies: *David Rodney*¹; Pawel Koziatek¹; Peter Derlet²; Jean-Louis Barrat³; ¹INP Grenoble; ²Paul Scherrer Institut; ³Université Joseph Fourier

9:50 AM Break

10:05 AM Invited

Weibull Analysis of Fracture Strength for Zr₅₅Ti₂Co₂₈Al₁₅ Bulk Metallic Glass: Tension-Compression Asymmetry and Porosity Effect: *Jian Xu*¹; Hui-li Gao¹; Yong Shen¹; ¹Institute of Metal Research, Chinese Academy of Sciences

10:25 AM

Quantitative Microstructural Characterization of Metallic Glass/Crystalline Composites: *Nicholas Hutchinson*¹; Katharine Flores¹; ¹The Ohio State University

10:35 AM Invited

Micromechanisms of a Dendrite/Zr-Based Bulk-Metallic-Glass Composite Subjected to Plastic Deformation: E-Wen Huang¹; Junwei Qiao²; Bartłomiej Winiarski³; Richard Moat³; Andrew Chuang⁴; Mario Scheel⁵; Marco Michiel⁵; Philip Withers³; *Yu-Lih Huang*¹; Yong Zhang⁶; Peter Liaw⁴; ¹National Central University, Taiwan; ²Taiyuan University of Technology, Taiyuan, China.; ³University of Manchester, Manchester, United Kingdom; ⁴The University of Tennessee; ⁵European Synchrotron Radiation Facility Beamline ID15; ⁶University of Science and Technology Beijing

10:55 AM

Load Relaxation Behavior Of Fe-Based Metallic Glass Supercooled Liquid: *Rui Yamada*¹; Noriharu Yodoshi¹; Akira Kawasaki¹; ¹Tohoku University

11:05 AM Invited

Tensile Micromechanism Crossover for Bulk-Metallic-Glass-Matrix Composites: From Working Hardening to Softening: *Junwei Qiao*¹; A.C. Sun²; E.W. Huang³; Y. Zhang⁴; P.K. Liaw⁵; C.P. Chuang⁵; ¹Taiyuan University of Technology; ²Yuan Ze University; ³National Central University; ⁴University of Science and Technology Beijing; ⁵The University of Tennessee

11:25 AM

Evaluations of Physical and Optical Properties of Metallic Glass Patterns Formed in Micro/Nano Scales: *Y. C. Chen*¹; S. Song²; T.R. Tsai²; J. S. C. Jang³; Y. M. Chen¹; S. E. Lee¹; Jinn P. Chu¹; ¹National Taiwan University of Science and Technology; ²National Taiwan Ocean University; ³National Central University

Bulk Metallic Glasses IX: Structures and Other Properties I

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

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

Thursday AM
March 15, 2012

Room: Swan 1
Location: Swan Resort

Session Chairs: Jörg Löffler, ETH Zurich; Maria Baró, Universitat Autònoma de Barcelona

8:30 AM Invited

Effect of Structure on the Devitrification Pathways in Al-Tb System: *Matthew Kramer*¹; Y. Kalay²; Paul Voyles³; Hwang Jinwoo³; Ryan Ott⁴; Matt Besser⁴; Ying Zhang⁴; YaQiao Wu⁴; ¹Iowa State University; ²Middle East Technical University; ³University of Wisconsin, Madison; ⁴Ames Laboratory

8:50 AM

Thermomechanical Joining of Bulk Metallic Glass Composites: *Scott Roberts*¹; Douglas Hofmann²; William Johnson¹; ¹California Institute of Technology; ²NASA - JPL

9:00 AM Invited

Dynamics of Shear Banding in Bulk Metallic Glasses: *Jörg Löffler*¹; David Klaumünzer¹; Robert Maass¹; ¹ETH Zurich



TMS 2012

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THURSDAY AM

9:20 AM

Thermodynamics of Isolated Bi-Atomic Clusters: *Garth Wilks*¹; Jose Reveles²; Daniel Miracle¹; Shiv Khanna²; ¹Air Force Research Laboratory; ²Virginia Commonwealth University

9:30 AM Invited

Primary Transformation Kinetics and Mechanical Properties of Zr-Al-Ni-Cu-Based Metallic Glass in Various Relaxation States: *Junji Saida*¹; Albertus Setyawan¹; ¹Tohoku University

9:50 AM

Ion Irradiation Induced Nanocrystallization of Metallic Glasses: *Lin Shao*¹; ¹Texas A&M University

10:00 AM Break

10:15 AM Invited

Pressure-Induced Phase Transitions in Metallic Glasses: *Jianzhong Jiang*¹; ¹University of Tennessee

10:35 AM

Crystallization Kinetics of Ca-Based Bulk Metallic Glasses: *Lei Hu*¹; Feng Ye¹; ¹University of Science and Technology Beijing

10:45 AM Invited

Effects of Alloying On the Glass Forming Ability and Mechanical Properties of Ti-Based Bulk Metallic Glasses: *Ke-Fu Yao*¹; Pan Gong¹; ¹Tsinghua University

11:05 AM

Study on Fracture Strength Reliability of Mg-Zn-Ca Bulk Metallic Glasses: *Junhua You*¹; ¹Shenyang University of Technology

11:15 AM Invited

Tensile Fracture Criterion of Metallic Glasses: *Zhefeng Zhang*¹; R. T. Qu¹; ¹Institute of Metal Research

11:35 AM

The Deformation Modes and Universal Scaling Properties in Metallic Glasses: *Pengyang Zhao*¹; Ju Li²; Yunzhi Wang¹; ¹The Ohio State University; ²Massachusetts Institute of Technology

11:45 AM Invited

Evolution of the Mechanical, Magnetic and Anti-Corrosion Behavior of Fe-Co-B-Si-Nb Bulk Metallic Glass during Thermally-Induced Devitrification: *Jordina Fornell*¹; Sergio González¹; Emma Rossinyol¹; Eva Pellicer¹; Santiago Suriñach¹; Dimitri Louzguine¹; Akihisa Inoue¹; Jordi Sort¹; Josep Nogués¹; *Maria D Baró*¹; ¹Universitat Autònoma de Barcelona

12:05 PM

Fabrication and Mechanical Properties of Melt-Extracted Fe-Based Amorphous Wires: *Weibing Liao*¹; Yong Zhang¹; ¹University of Science and Technology Beijing

CFD Modeling and Simulation in Materials

Processing: Modeling of Steelmaking Processes

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Materials Processing and Manufacturing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee
Program Organizers: Laurentiu Nastac, The University of Alabama; Lifeng Zhang, Missouri University of Science and Technology; Brian Thomas, University of Illinois at Urbana-Champaign; Adrian Sabau, Oak Ridge National Lab; Nagy El-Kaddah, The University of Alabama; Adam Powell, Metal Oxygen Separation Technologies, Inc.; Hervé Combeau, Institut Jean Lamour

Thursday AM
March 15, 2012

Room: Oceanic 6
Location: Dolphin Resort

Session Chairs: Brian Thomas, University of Illinois at Urbana-Champaign; Koulis Pericleous, University of Greenwich

8:30 AM Keynote

Transport and Entrapment of Particles in Steel Continuous Casting: *Brian Thomas*¹; Quan Yuan²; Rui Liu¹; Sana Mahmood¹; Rajneesh Chaudhary¹; ¹University of Illinois at Urbana-Champaign; ²Dow Chemical Company

9:00 AM Invited

Mathematical Modeling of a Compressible Oxygen Jet Interacting with a Free Surface in a Basic Oxygen Furnace for Steel Production: *Koulis Pericleous*¹; Bruno Lebon²; Georgi Djambazov²; Mayur Patel²; ¹University of Greenwich; ²University of Greenwich

9:25 AM

CFD Model for Prediction of Liquid Steel Temperature in Ladle during Steel Making and Casting: *Anurag Tripathi*¹; J.K. Saha¹; J.B. Singh¹; S.K. Ajmani¹; ¹Tata Steel Ltd

9:45 AM

Multiphase Flow in a Steelmaking Converter Using an Unconventional Lance: *Miguel Barron*¹; Isaias Hilerio¹; Antonio de Ita¹; ¹Universidad Autonoma Metropolitana Azcapotzalco

10:05 AM Break

10:25 AM

Fluid Flow and Inclusion Removal in Multi-Strand Tundish with Nozzle Blockage: *Pradeep Jha*¹; Sabin Mishra¹; Satish Sharma¹; Satish Ajmani²; Manas Mahapatra¹; ¹IIT Roorkee; ²Tata Steel

10:45 AM

CFD Modeling of Fluid Flow Behavior and Bath Surface Deformation in LD Converter: *Tarun Kundu*¹; ¹IIT Kharagpur

11:05 AM

Effect of Thermal Buoyancy Force on the Flow, Temperature Distribution and Residence Time Distribution of Molten Steel in the Slab Casting Tundish: *Haibo Sun*¹; Bo Yan¹; Jiaquan Zhang¹; ¹State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing

11:25 AM

Time Zone Analysis of F-Curve for Intermixing during Ladle Change-Over: *Pradeep Jha*¹; *Suman Kant*¹; Pradeep Kumar¹; Anand Kumar¹; ¹IIT Roorkee

Characterization of Minerals, Metals, and Materials: Characterization of Carbon and Soft Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jiann-Yang Hwang, Michigan Technological University; Sergio Montero, State University of North Rio De Janeiro; Chenguang Bai, Chongqing University; John Carpenter, US Department of Energy; Donato Firrao, Politecnico di Torino; Byoung-Gon Kim, Korea Institute of Geoscience & Mineral Resources; Mingdong Cai, Schlumberger

Thursday AM
March 15, 2012

Room: Asia 2
Location: Dolphin Resort

Session Chairs: Shadia Ikhmayies, Al Isra University; Jinhui Peng, Kunming University of Science and Technology

8:30 AM

Thermal Properties of Polyester Composites Incorporated with Coir Fiber: *Helvio Santafé Júnior*¹; Noan Simonassi¹; Sérgio Monteiro¹; ¹Universidade Estadual do Norte Fluminense-Darcy Ribeiro

8:45 AM

High Temperature Plastic Crystal Structure Characterization Studies of Orientationally Order/disordered Organic Compounds - Pentaglycerine and 2-Amino-2-methyl-1, 3-propanediol Binary System: *Wen-Ming Chien*¹; Ivan Gantan¹; Amrita Mishra¹; Dhanesh Chandra¹; ¹University of Nevada, Reno

9:00 AM

Investigating the Rheology of LCPs through Different Die Geometries: *Arash Ahmadzadegan*¹; *Michael Zimmerman*¹; Anil Saigal¹; ¹Tufts University

9:15 AM

Characterization of Graphite from PAN Aerogels: *Shruti Mahadik*¹; *Clarissa Wisner*¹; Anand Sadekar¹; Abhishek Bang¹; Massimo Bertino²; Chariklia Sotiriou-Leventis¹; Nicholas Leventis¹; ¹MS&T; ²Virginia Commonwealth University

9:30 AM

Effect of the Fiber Equivalent Diameter on the Elastic Modulus and Density of Sisal Fibers: *Artur Camposo Pereira*¹; Sergio Monteiro¹; Wellington Inácio¹; ¹Universidade Estadual do Norte Fluminense

9:45 AM

Tensile Fracture Analysis of Polymer Matrix Composites: *Jeongguk Kim*¹; Sung-Cheol Yoon¹; Jung-Seok Kim¹; Hyuk-Jin Yoon¹; Sung-Tae Kwon¹; ¹Korea Railroad Research Institute

10:00 AM

Correlation between the Density and the Diameter of Buriti Fibers: *Anderson Barbosa*¹; Michel Oliveira¹; Alex Almeida¹; Núbia Santos²; Frederico Margem¹; Sergio Monteiro¹; ¹State University of the Northern Rio de Janeiro, UENF; ²State University of Pará

10:15 AM

Thermal and Morphological Behavior of EVOH/Piassava Fiber Composites: *Beatriz Nogueira*¹; Anne Chinellato²; *Angel Ortiz*¹; Arifa Parveen³; Vijaya Rangari³; Esperidiana Moura¹; Instituto de Pesquisas Energéticas e Nucleares - Ipen-Cnen/Sp; ²Universidade Federal do ABC - UFABC; ³Tuskegee University

10:30 AM

Characterization of Thermal Behavior of Epoxy Composites Reinforced with Banana Fibers by TGA/DTG and DSC: *Nathalia Rosa*¹; Lucas Martins¹; Sergio Monteiro¹; Ruben Rodriguez¹; Tereza Castillo¹; ¹UENF

10:45 AM

Comparative Studies OF Crushing Behavior of Various Fiber Reinforced Skin Polyurethane Foam Cored Composite Sandwich Structures: *Krishna Sharma*¹; Sripathy Mallaiah¹; ¹Bangalore University

11:00 AM

Elastic Modulus Variation with Diameter for Ramie Fibers: *Alice Bevitoni*¹; Isabela da Silva¹; Renan Carreiro¹; Sergio Monteiro¹; ¹UENF

11:15 AM

Comparative Study of the Sugarcane Bagasse Fiber/HDPE Composite Properties Using Electron-Beam and Gamma Radiation Treatments: *Amanda Pereira*¹; Alejandra Soria²; Anibal Abreu²; Anne Chinellato³; Nélica del Mastro¹; *Esperidiana Moura*⁴; ¹INSTITUTO DE PESQUISAS ENERGÉTICAS E NUCLEARES - IPEN-CNEN/SP; ²Laboratório Tecnológico del Uruguay; ³Universidade Federal do ABC - UFABC; ⁴INSTITUTO DE PESQUISAS ENERGÉTICAS E NUCLEARES - IPEN-CNEN/SP

11:30 AM

Effect of Diameter on the Density and Tensile Elastic Modulus of Curaua Fibers: *Felipe Lopes*¹; Renan Carreiro²; Noan Simonassi²; Ailton Ferreira³; Sergio Monteiro²; ¹IME; ²UENF; ³UFF

Characterization of Minerals, Metals, and Materials: Characterization of Light Metals

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jiann-Yang Hwang, Michigan Technological University; Sergio Montero, State University of North Rio De Janeiro; Chenguang Bai, Chongqing University; John Carpenter, US Department of Energy; Donato Firrao, Politecnico di Torino; Byoung-Gon Kim, Korea Institute of Geoscience & Mineral Resources; Mingdong Cai, Schlumberger

Thursday AM
March 15, 2012

Room: Europe 6
Location: Dolphin Resort

Session Chairs: Xuewei Lv, Chongqing University; Gulhayat SAYGILI, Istanbul Technical University

8:30 AM

Influence of Deformation on the Properties of carbon-Fiber Reinforced 2024 Alloy Matrix Composites: *Wu Linli*¹; ¹Northeastern University

8:45 AM

Microstructure and Deformation Behavior of Mg-Zn-Al-Re Magnesium Alloy: *Jing Zhang*¹; Fusheng Pan¹; Chenguang Bai¹; ¹Chongqing university

9:00 AM

Microstructures and Properties of Solid and Open-Cellular \square -TiAl Fabricated by Electron Beam Melting (EBM): *J. Hernandez*¹; L. E. Murr¹; S. M. Gaytan¹; S. J. Li²; X. Y. Cheng²; Y. X. Tian²; F. Medina¹; R. B. Wicker¹; ¹University of Texas at El Paso; ²Shenyang National Laboratory for Materials Science



TMS 2012

141st Annual Meeting & Exhibition

THURSDAY AM

9:15 AM

Microstructures and Tensile Mechanical Properties of Mg-9Zn-0.6Zr-2Er Magnesium Alloy Processed by Hot Rolling and Heat Treatment: Jing Zhang¹; *Baoxiang Zhang*¹; ¹Chongqing University

9:30 AM

Nanobond - The Perfect Refractory Choice for Quick Lining and Repairing of Aluminium Melting Furnaces: *Thomas Schemmel*¹; Helge Jansen¹; Bertram Kesselheim¹; Uwe Kremer²; ¹Refratechnik Steel GmbH; ²TRIMET Aluminium GmbH

9:45 AM Break

9:55 AM

Study on Graphitization of Cathode Carbon Blocks for Aluminum Electrolysis: *Gao Feng*¹; FengNai Xiang²; Yang Jian Zhuang²; Niu Qing Ren³; He Hua³; Han Li Guo³; ¹ Northeastern University; ²Northeastern University; ³Qingtongxia Aluminum Limited Corporation, Qingtongxia

10:10 AM

Wear Resistance of Graphite /Aluminum Compound Material that Prepared by Stirring Casting: *Wu Linli*¹; Yao Guangchun¹; ¹Northeastern University

10:25 AM

Characterization of Grit Blasted Metallic Biomaterials by Thermoelectric Power Measurements: *Hector Carreon*¹; Sandra Barriuso²; Jose Luis González-Carrasco²; Francisca Garcia-Caballero²; Marcela Lieblich²; ¹UMSNH; ²Centro Nacional de Investigaciones Metalúrgicas (CENIM-CSIC)

10:40 AM

Exploring Microstructure-Corrosion Property Correlations in 5000-Series Alloys Using Higher-Order Statistical Metrics: *Daniel Satko*¹; Jonathan Kaufman¹; Joshua Shaffer¹; Roger Doherty¹; Surya Kalidindi¹; ¹Drexel University

10:55 AM

Modeling the Mechanical Response of Aluminum A359-SiCp-30%: *James DeMarco*¹; Justin Karl¹; Yongho Sohn¹; Ali Gordon¹; ¹UCF MMAE Dept.

Computational Thermodynamics and Kinetics: Interfaces

Sponsored by: The Minerals, Metals and Materials Society, 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, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Phase Transformations Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Zi-Kui Liu, The Pennsylvania State University; Mark Asta, University of California, Berkeley; James Warren, The National Institute of Standards and Technology; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yu Wang, Michigan Tech

Thursday AM

March 15, 2012

Room: Australia 3

Location: Dolphin Resort

Session Chairs: Jeff Hoyt, McMaster University; Christopher Woodward, US Air Force

8:30 AM Invited

First Principles Modeling of Solid-Solid Interfaces: *Christopher Woodward*¹; ¹Air Force Research Laboratory

8:55 AM Invited

Grain Boundary Energy Function for FCC Metals: *Vasily Bulatov*¹; ¹LLNL

9:20 AM

Topological Evolution of Grains in 3D Monte Carlo Modeled Grain Growth: *Burton Patterson*¹; Robert DeHoff¹; Veena Tikare²; David Rule¹; Amy Adams¹; ¹University of Florida; ²Sandia National Laboratories

9:35 AM

Modeling the Asymptotic Grain Face Distribution in Terms of Topological Event Rates: *Robert DeHoff*¹; Burton Patterson¹; Veena Tikare²; David Rule¹; Amy Adams¹; ¹University of Florida; ²Sandia National Laboratories

9:50 AM

4D Grain Growth Kinetics in High-Purity Aluminum: *Anthony Johnson*¹; Stefan Poulsen²; Andrew King³; Wolfgang Ludwig³; David Rule⁴; Burton Patterson⁴; Peter Voorhees¹; Erik Lauridsen²; ¹Northwestern University; ²Riso National Laboratory for Sustainable Energy; ³European Synchrotron Radiation Facility; ⁴University of Florida

10:05 AM Break

10:35 AM Invited

Grain Boundary Migration and Grain Growth: What I Do & Do Not Understand: *David Srolovitz*¹; ¹Institute for High Performance Computing, Agency for Science, Technology and Research, Singapore

11:00 AM Invited

The Mobility of Interfaces and Grain Boundaries from Molecular Dynamics Simulations: H. Song¹; M. J. Rahman¹; *Jeffrey Hoyt*¹; ¹McMaster University

11:25 AM

Lattice Monte Carlo Determination of Harrison Kinetics Regimes for Grain Boundary Diffusion in Materials with Inhomogeneous Grain Structures: *Irina Belova*¹; Graeme Murch¹; Thomas Fiedler¹; ¹The University of Newcastle

11:40 AM

Molecular Dynamics Study of Solid-Liquid Interface Migration in Ni-Zr Alloys: *Mikhail Mendeleev*¹; ¹Ames Laboratory

Electrode Technology for Aluminium Production: Inert Anode and Wettable Cathode Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee

Program Organizer: Morten Sorlie, Alcoa Norway

Thursday AM

March 15, 2012

Room: Americas Seminar

Location: Dolphin Resort

Session Chair: Jilai Xue, University of Science and Technology Beijing

8:30 AM

Electrolysis Expansion Performance of Modified Pitch Based TiB₂-C Composite Cathode in [K₃AlF₆/Na₃AlF₆]-AlF₃-Al₂O₃ Melts: Fang Zhao¹; Xu Jian²; Hou Jin-Long²; Li Lin-Bo¹; *Zhu Jun*¹; ¹School of Metallurgical Engineering, Xi'an University of Architecture and Technology; ²School of Metallurgical Science and Engineering, Central South University

8:55 AM

Pulse Electrodeposition of TiB₂ onto Graphite from TiO₂-B₂O₃-KF-LiF Melts: *Bing Li*¹; Lushan Jiang¹; Heng Wang¹; ¹East China University of Science and Technology

9:20 AM

Ball-Milled Cu-Ni-Fe-X Materials as Inert Anodes for Al Production in KF-AIF₃ Low-Temperature Electrolyte: *Sébastien Helle*¹; Valery Ouvrevar-Bancalero¹; Boyd Davis²; Daniel Guay¹; Lionel Roué¹; ¹INRS-Énergie, Matériaux et Télécommunication; ²Kingston Process Metallurgy Inc

9:45 AM Break

10:00 AM

Effect of Nanopowder Content on Properties of NiFe₂O₄ Matrix Inert Anode for Aluminum Electrolysis: *Zhigang Zhang*¹; Yihan Liu¹; Guangchun Yao¹; Di Wu¹; Junfei Ma¹; ¹Northeastern University

10:25 AM

Effect of MnO₂ Addition on Early-Stage Sintering Behavior and Properties of NiFe₂O₄ Ceramics: *Jinjing Du*¹; Yihan Liu¹; Guangchun Yao¹; Xiuli Long¹; Xiao Zhang¹; ¹Northeastern University

10:50 AM

Study on the Inert Anode for Al Electrolysis Based on the NiFe₂O₄ Spinel Ceramics: *Yihan Liu*¹; Ming Zhao¹; Jing Li¹; ¹Northeastern University

Energy Nanomaterials: Fuel Cells, Hydrogen Storage, Ferroelectrics, Wind Energy

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Reza Shahbazian-Yassar, Michigan Technological University; Ming Au, Savannah River National Laboratory; Meyya Meyyappan, NASA Ames Research Center

Thursday AM
March 15, 2012

Room: Swan 3
Location: Swan Resort

Session Chairs: Hamid Garmestani, Georgia Institute of Technology; Reza Shahbazian Yassar, Michigan Technological University

8:30 AM Invited

Multi-Physics Functional Design of HeteroFoam Nanomaterials for Energy Systems: *Ken Reifsnider*¹; Fazle Rabbi¹; Rassel Raihan¹; ¹University of South Carolina

8:55 AM

Electrochemical Properties of Hydride Reduced LaSrCoO_{4.048} as IT-SOFC Cathode Material Based on Ba(Zr_{0.1}Ce_{0.7}Y_{0.2})O₃ Electrolyte: *Bo Peng*¹; Gang Chen¹; Tao Wang¹; Jun Zhou¹; Jiaojiao Guo¹; Yonghong Cheng¹; Kai Wu¹; ¹Xi'an Jiaotong University

9:10 AM

Crystallization and Electrochemical Performance of LSCF-CGO Thin Film Cathodes Processed by Single Solution Spray Pyrolysis: *Elliott Slamovich*¹; Bainye Angoua¹; Patrick Cantwell²; Eric Stach³; ¹Purdue University; ²Lehigh University; ³Brookhaven National Laboratory

9:25 AM Invited

Oxides as Energy Materials: *Shriram Ramanathan*¹; ¹Harvard Univ

9:45 AM Invited

A Quantitative Understanding of Interface Dynamics in Complex Oxides with In Situ TEM: *Mitra Taheri*¹; ¹Drexel University- Department of Materials Science & Engineering

10:05 AM Break

10:25 AM

Design of Light Weight Structure for Wind Turbine Tower by Using Nano-Materials: *Ying Li*¹; Jian Lu¹; ¹City University of Hong Kong

10:40 AM

Improved Design of Metal-Organic Framework Family for Efficient Hydrogen Storage: *Sang Soo Han*¹; William Goddard²; ¹Korea Research Institute of Standards and Science; ²California Institute of Technology

10:55 AM

Magnesium-Based Hydrogen Storage Nanomaterials: *Hongmin Kan*¹; Ning Zhang¹; Xiao-Yang Wang¹; Hong Sun¹; ¹Shenyang University

11:10 AM

TEM Guided Microstructural Design of MgH₂ Powders and Thin Film Alloys with Room Temperature Volumetric Hydrogen Cycling Ability: *David Mitlin*¹; Peter Kalisvaart¹; Mohsen Danaie¹; Shu Tao²; Ben Zahir¹; Helmut Fritzsche³; ¹University of Alberta and NINT NRC; ²Eindhoven University of Technology; ³SIMS-CNRC NRC

11:25 AM

Development of Novel Nanostructured Electrolytes for Low Temperature Solid Oxide Fuel Cells Applications: *Hoda Amani Hamedani*¹; ¹Georgia Institute of Technology

11:40 AM Invited

Development of Superhydrophobic Nano-structured Surfaces for High Efficiency Power Generation: *Ghazal Azimi*¹; Kripa Varanasi¹; ¹MIT

Energy Technologies and Carbon Dioxide Management: Energy Technologies

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee

Program Organizers: Maria Salazar-Villalpando, DOE/National Energy Technology Laboratory; Neale Neelameggham, IND LLC* ; Donna Guillen, Idaho National Laboratory; Subodh Das, Phinix, LLC; Ramana Reddy, Univ of Alabama; Animesh Jha , Univ of Leeds; Soobhankar "Sib" Pati, Metal Oxygen Separation Technologies (MOxST); Mark Jolly, Univ of Birmingham; Lakshmanan Vaikuntam, Process Research ORTECH Inc

Thursday AM
March 15, 2012

Room: Europe 8
Location: Dolphin Resort

Session Chairs: Mahesh Jha, US Dept of Energy; Maria Salazar-Villalpando, DOE/NETL; Animesh Jha, University of Leeds; Soobhankar Pati, Metal Oxygen Separation Technologies

8:30 AM Introductory Comments

8:35 AM

Energy Opportunities in the Aluminum Processing Industry: *Cynthia Belt*¹; ¹Consultant

8:55 AM

An Overview of Energy Consumption and Waste Generation in the Recovery of Cobalt from Copper Sulphide Smelting and Converting Slag and the Proposed Solution: Animesh Jha¹; Yotamu Hara¹; ¹University of Leeds

9:15 AM

High Thermal Energy Storage Density LiNO₃-NaNO₃-KNO₃-KNO₂ Quaternary Molten Salts for Parabolic Trough Solar Power Generation: *Tao Wang*¹; Divakar Mantha¹; Ramana Reddy¹; ¹The University of Alabama



TMS 2012

141st Annual Meeting & Exhibition

THURSDAY AM

9:30 AM

Global Primary Aluminium Industry 2010 Life Cycle Inventory: *Chris Bayliss*¹; Marlen Bertram¹; Kurt Buxmann¹; Bernard de Gelas¹; Samantha Jones¹; Linlin Wu¹; ¹International Aluminium Institute

9:45 AM Break

9:55 AM

Analysis of Combustion Efficiency Using Laser-Induced Fluorescence Measurements of OH-Radicals: *Matthias Schnitzler*¹; Ralf Bölling¹; Herbert Pfeifer¹; ¹IOB RWTH Aachen

10:10 AM

A Solid State Thermoelectric Power Generator Prototype Designed to Recover Radiant Waste Heat: *Marit Takla*¹; Odne Burheim¹; Leiv Kolbeinsen¹; Signe Kjelstrup¹; ¹Norwegian University of Science and Technology

10:25 AM

Study on Smelting Reduction of Coal-Containing Pellets of V-Ti Bearing Beach Placers by Combined Rotary Hearth Furnace and Direct Current Arc Furnace: *Huimin Lu*¹; Jingbo Xu¹; Qiang Li¹; ¹Beihang University

10:40 AM

A Novel Method Combined Ionothermal Synthesis and Microwave Energies for Rapid Production of ZIFS: *Lisha Yang*¹; Huimin Lu¹; Shi Zhou¹; ¹Beihang University

10:55 AM

The Relationship between Energy Consumption and CO₂ Emissions in Iron and Steel Making: *Hao Bai*¹; Xin Lu¹; Hongxu Li¹; Lihua Zhao¹; Xueting Liu¹; Ning Li¹; Wei Wei¹; Daqiang Cang¹; ¹University of Science and Technology Beijing

11:10 AM

Development and Application of Shaft Kiln in China: Zhen Guo Li¹; Dong Li²; Guang Zhen He³; ¹Shanghai Cadre Environment Energy Science and Technology Co., Ltd; ²Shanghai Cadre Environment Energy Science and Technology Co., Ltd; ³Shenyang He Carbon Furnace Design Institute

11:25 AM

Preparation of Biodiesel by Transesterification of Canola Oil Using Solid Base Catalyst KOH / α -Al₂O₃: *Seyed Mojtaba Sadrameli*¹; Mohamad Omraei¹; ¹TMU

From Macro to Nano, Understanding Mechanical Behavior across Length Scales: A Structural Materials Division Symposium in Honor of Robert Ritchie: Mechanical Behavior of Novel Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Biomaterials Committee
Program Organizers: Jamie Kruzic, Oregon State University; Brad Boyce, Sandia National Labs; Reinhold Dauskardt, Stanford University

Thursday AM
March 15, 2012

Room: Mockingbird 1
Location: Swan Resort

Session Chairs: Jamie Kruzic, Oregon State University; Mark Hoffman, The University of New South Wales

8:30 AM Introductory Comments

8:35 AM Keynote

Crack-Tip Process Zones in Piezoelectric Ceramics under Mechanical and Electrical Quasistatic and Fatigue Loading: *Mark Hoffman*¹; ¹The University of New South Wales

9:15 AM

In Situ Ultrahigh Temperature X-Ray Microtomography Facility for New Generation Structural Material: *Hrishikesh Bale*¹; Abdel Haboub²; James Nasiatka²; Alastair MacDowell²; Brian Cox³; David Marshall³; Robert Ritchie¹; ¹University of California, Berkeley; ²Lawrence Berkeley National Lab.; ³Teledyne Scientific LLC

9:30 AM

Investigation of the Mechanical Properties of Ti₂SC & Ti₃SiC₂ via In-Situ Neutron Diffraction and Elasto-Plastic Self-Consistent Modeling: *Mohamed Shamma*¹; Volker Presser¹; Bjorn Clausen²; Don Brown²; Michel Barsoum¹; ¹Drexel University; ²Los Alamos National Laboratory

9:45 AM

Multi-Scale Energy Absorption Mechanisms in Micro-Architected Materials: *Lorenzo Valdevit*¹; Alan Jacobsen²; Tobias Schaedler²; William Carter²; ¹University of California, Irvine; ²HRL Laboratories

10:00 AM Break

10:15 AM

Effect of Grain Neighborhood on Pseudoelastic Performance of Polycrystalline Shape Memory Alloys: Harshad Paranjape¹; *Peter Anderson*¹; ¹The Ohio State University

10:30 AM

Novel Characterization of the Martensitic Transformation Temperature of NiTi Shape Memory Alloys via Micro-Indentation: *Bin Gan*¹; Sara Cantonwine¹; Mathilde Gatepin¹; Sammy Tin¹; ¹Illinois Institute of Technology

10:45 AM

Fatigue Life-Prediction of Nitinol under Multiaxial Loading: *David Xu*¹; Robert Ritchie¹; ¹UC Berkeley

11:00 AM

Adhesion of Nickel-Titanium Shape Memory Alloy Wires to Polymeric Materials: Theory and Experiment: *Louis Hector Jr¹; Federico Antico²; Pablo Zavattieri²; ¹GM R&D Center; ²Purdue University*

11:15 AM

Toughening in Bio-Inspired Shape Memory Alloy Embedded Composites: *Fatmata Barrie¹; Michele Manuel¹; ¹University of Florida*

11:30 AM

The Effect of Morphology on the Mechanical Behavior of Cu(Ni)-C Nanocomposites: *Alan Jankowski¹; Tanvir Ahmed¹; ¹Texas Tech University*

Magnesium Technology 2012: Advanced Processing and Joining

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht; Neale Neelameggham, U.S. Magnesium

Thursday AM
March 15, 2012

Room: Southern V
Location: Dolphin Resort

Session Chairs: Suveen Mathaudhu, U.S. Army Research Office; Brian Jordan, University of Alabama

8:30 AM

Microstructure and Creep Properties of MEZ Magnesium Alloy Processed by Thixocasting: *Emma Deyanira Morales Garza¹; Hajo Dieringa¹; Norbert Hort¹; ¹Helmholtz-Zentrum Geesthacht*

8:50 AM

The Effect of Friction Stir Processing on Microstructure and Tensile Behavior of Thixomolded AZ91 Magnesium Alloy: *Bilal Mansoor¹; Raymond Decker²; Sanjay Kulkarni²; Steve LeBeau²; Marwan Khraisheh¹; ¹Masdar Institute of Science and Technology, Abu Dhabi, UAE; ²Thixomat Inc.*

9:10 AM

Effect of Weld Structure on Fatigue Life of Friction Stir Spot Welding in Magnesium AZ31 Alloy: *Harish Rao¹; J Jordan¹; ¹The University of Alabama*

9:30 AM

Effect of Corrosion on the Tensile Properties of Friction-Stir Welded AZ31B Sheet: *Jennifer Thuss¹; Joseph Kish¹; Joseph McDermid¹; ¹Centre for Automotive Materials and Corrosion, McMaster University*

9:50 AM

High Speed Rolling of AZ31 and Mg-Zn-Ce Alloys: *Mehdi Sanjari¹; Amir Farzadfar²; In-Ho Jung²; Steve Yue²; Masahiro Hattori³; T Sakai³; Hiroshi Utsunomiya³; Elhachmi Essadiqic⁴; ¹McGill ; ²McGill; ³Osaka University; ⁴CANMET*

10:10 AM Break

10:30 AM

On the Effect of Ti₂AlC on the Formation of Thermally Stable Mg Nano Grains: *Babak Anasori¹; Michel Barsoum¹; ¹Drexel University*

10:50 AM

Experimental Investigations on the Deformation Behavior of Thixo-Molded Mg Sheet Alloy: *Muammer Koc¹; Omer Cora²; Ryan Snell³; Ray Dekker⁴; Jack Huang⁴; ¹Istanbul Sehir University; ²Karadeniz Tech Univ; ³VCU; ⁴Thixomat*

11:10 AM

Effects of High Temperature Shot Peening on Surface Characteristics and Fatigue Properties of Forged AZ31 Magnesium Alloys: *Ichihara Yuki¹; Masahumi Noda¹; Kunio Funami¹; ¹Chiba Institute of Technology*

11:30 AM

Solid Solution Hardening Effect of Aluminum on the Creep Deformation of AZ91 Magnesium Alloy: *Farhoud Kabirian¹; Reza Mahmoudi²; ¹University of Maryland, Baltimore County; ²University of Tehran*

Magnesium Technology 2012: Processing-Microstructure-Property Relationships I

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht; Neale Neelameggham, U.S. Magnesium

Thursday AM
March 15, 2012

Room: Southern IV
Location: Dolphin Resort

Session Chairs: Hidetoshi Somekawa, National Institute of Materials Science; Kyu Cho, U.S. Army Research Laboratory

8:30 AM

Microstructure Modeling of Magnesium Alloys for Engineering Property Prediction: *Erin Barker¹; Dongsheng Li¹; Xin Sun¹; Mohammad Khaleel¹; ¹Pacific Northwest National Lab*

8:50 AM

Microstructure Modification and Deformation Behavior of Fine-Grained AZ61 Sheet Produced by Thixomolding and Thermomechanical Processing (TTMP): *Tracy Berman¹; William Donlon¹; Victoria Miller²; Jack Huang³; Raymond Decker³; Tresa Pollock²; J. Wayne Jones¹; ¹University of Michigan; ²University of California Santa Barbara; ³nanoMAG, LLC*

9:10 AM

Development of High Strength and Toughness Magnesium Alloy by Grain Boundary Control: *Hidetoshi Somekawa¹; Alok Singh¹; Tadanobu Inoue¹; Toshiji Mukai²; ¹National Institute for Materials Science; ²Kobe University*

9:30 AM

Effects of Direct Extrusion Process on Microstructure, Texture Evolution and Yield Strength of Magnesium Alloy AZ31: *Shiyao Huang¹; Mei Li¹; John Allison²; Shaorui Zhang³; Dayong Li³; Yinghong Peng³; ¹Ford Motor Company; ²University of Michigan; ³Shanghai Jiao Tong University*

10:10 AM Break

9:50 AM

Comparison of Tensile Properties and Crystallographic Texture of Three Magnesium Alloy Sheets: *Junying Min¹; Ying Cao¹; Jon Carter²; Ravi Verma²; ¹Tongji University; ²GM R&D*



TMS 2012

141st Annual Meeting & Exhibition

THURSDAY AM

10:30 AM

Strain Hardening of ZK60 Magnesium Alloys: *Jaehyung Cho*¹; Suk Bong Kang¹; ¹Korea Institute of Materials Science

10:50 AM

Strain-Rate Effects of Sand-Cast and Die-Cast Magnesium Alloys under Compressive Loading: *J.P. Weiler*¹; J.T. Wood¹; ¹University of Western Ontario

11:10 AM

Mechanical Properties of Newly Developed Mg-Alloys AMX602 AND ZAXE1711 under Quasi-Static and Dynamic Loading: *Jianghua Shen*¹; Weihua Yin¹; Katsuyoshi Kondoh²; Tyrone L. Jones³; Suveen N. Mathaudhu⁴; Zhiliang Pan¹; Laszlo Kecskes⁵; Qiuming Wei¹; ¹UNC Charlotte; ²Osaka University; ³US Army Research Laboratory; ⁴U.S. Army Research Office

11:30 AM

Phase Field Modeling of β_1 Precipitation in WE54 Alloy: *Yipeng Gao*¹; Hong Liu²; Rongpei Shi¹; Zhou Xu²; Jianfeng Nie²; Yunzhi Wang¹; ¹The Ohio State University; ²Monash University

Magnetic Materials for Energy Applications II: Power Conversion and Microstructural Effects

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Magnetic Materials Committee

Program Organizers: Raju Ramanujan, Nanyang Technological University; Francis Johnson, GE Global Research; S Guruswamy, Univ. of Utah; J Liu, Electron Energy Corporation

Thursday AM

March 15, 2012

Room: Europe 10

Location: Dolphin Resort

Session Chairs: Michael McHenry, Carnegie Mellon Univ.; Jun Ding, National University of Singapore

8:30 AM Invited

Nanocomposite Alloy Design for High Frequency Power Conversion Applications: Shen Shen¹; Paul Ohodnicki²; Samuel Kernion¹; Alex Leary¹; Vladimir Keylin³; Joseph Huth³; *Michael McHenry*¹; ¹Carnegie Mellon University; ²National Energy Technology Laboratory; ³Division of Spang & Company

9:00 AM Invited

Economic and Low-Temperature Fabrication of Highly-Textured Ferrite Films and Their Potential in Power-On-Chip Application: Y Yang¹; Jun Ding²; ¹Natl. Univ. of Singapore; ²National University of Singapore

9:30 AM

Magnetic Properties of Strontium Ferrite Prepared Using Submicron-Sized SrFe12-xAlxO19 Powders: *Vladimir Menushenkov*¹; Vladimir Shubakov²; Sergey Ketov²; ¹National University of Science and Technology «MISIS», ; ²National University of Science and Technology «MISIS»,

9:45 AM Break

10:00 AM

Effects of Magnetic Field on Microstructure Evolution in Decomposition Process: *Yongmei Jin*¹; Stephen Hackney¹; ¹Michigan Technological University

10:15 AM

Electrical and Structural Characteristics of Ba2DyNbO6: *Suharto Chjatterjee*¹; Koushik Biswas²; Mukul Pastor²; ¹Ace Calderys Ltd; ²Indian Institute of Technology, Karagpur, India

10:30 AM

Impact of Magnetic Fields on the Corrosion Degradation of Ferromagnetic Materials in Aqueous Electrolytes: *Ralph Sueptitz*¹; Kristina Tschulik¹; Margitta Uhlemann¹; Ludwig Schultz²; Annett Gebert¹; ¹IFW Dresden

10:45 AM

Influence of Magnetization on the Hydrogen Embrittlement Behavior in AISI 4340 Steel: *Meenakshisundaram Ramanathan*¹; Biswadeep Saha¹; Chai Ren¹; Sivaraman Guruswamy¹; Micheal McCarter¹; ¹University of Utah

11:00 AM

The Effect of Dynamic Electropulsing on Mechanical and Microstructural Properties of Cold Rolled Fe-6.5%Si Alloy Sheet: *Yongfeng Liang*¹; Feng Ye¹; Hongchan Zhou¹; Fuming Wang¹; Guoyi Tang²; Junpin Lin¹; ¹University of Science and Technology Beijing; ²Tsinghua University

Materials and Fuels for the Current and Advanced Nuclear Reactors: Modeling II

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS/ASM: Nuclear Materials Committee

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Thursday AM

March 15, 2012

Room: Swan 4

Location: Swan Resort

Session Chairs: Patrice Turchi, Lawrence Livermore National Laboratory; Michael Tonks, Idaho National Laboratory

8:30 AM

Pressure Effects in Iron-Uranium Diffusion Couples: *Daniel Koury*¹; Gerald Egeland¹; Abu Iqbal¹; Thomas Hartmann¹; ¹Harry Reid Center, University of Nevada - Las Vegas

8:50 AM

Thermodynamic Properties of Complex Actinide Alloys: *Patrice Turchi*¹; Alexander Landa¹; Per Söderlind¹; ¹Lawrence Livermore National Laboratory

9:10 AM

Effects of Stress on Void Formation under Irradiation: *Srujan Rokkam*¹; Karim Ahmed¹; Anter El-Azab¹; ¹Florida State University

9:30 AM

KMC Modeling of Helium-Vacancy Clustering in Iron: *Aaron Oaks*¹; James Stubbins¹; ¹University of Illinois, Urbana-Champaign

9:50 AM

Radiation-Induced Compositional Patterning and Segregation in Concentrated Binary Alloys: *Santosh Dubey*¹; Anter El Azab¹; ¹Florida State University

10:10 AM

Interaction of Self-Interstitial Clusters with Carbon Atoms and Carbon-Vacancy Complexes in Fe-C Alloys: *Anna Serra*¹; Napoleon Aento¹; ¹Universitat Politecnica de Catalunya

10:30 AM Break

10:40 AM

Interaction of $\frac{1}{2}\langle 111 \rangle\{110\}$ Edge Dislocation With Interstitial Carbon Atoms in α -Iron: *Hassan Khater*¹; Anna Serra¹; Ghiath Monnet²; ¹Universitat Politecnica de Catalunya (UPC); ²EDF - R&D

11:00 AM

Structure of Overlapping Ions Tracks in Solids: *Andrii Demchyshyn*¹; Pavel Selyshchev²; ¹Taras Shevchenko National University of Kyiv; ²University of Pretoria

11:20 AM

A New Model for Predicting the Oxidation/Gasification of Nuclear Graphite: *Ryan Paul*¹; John Morral¹; ¹The Ohio State University

11:40 AM

Cluster Dynamics Modeling of Microstructural Evolution in Ferritic/Martensitic Iron Chrome: *Aaron Kohner*¹; Brian Wirth²; Donghua Xu²; Djamel Kaoumi³; Arthur Motta⁴; Cem Topbasi⁴; ¹University of California; ²University of Tennessee; ³University of South Carolina; ⁴Pennsylvania State University

12:00 PM

2D/3D Simulation of δ -Hydride Re-Orientation under External Load by Phase Field Approach in Zircaloy Matrix: *Lingfei Zhang*¹; Ludovic Thuinet²; ¹Electricité de France (EDF) R&D MMC; ²University of Lille 1

Materials and Fuels for the Current and Advanced Nuclear Reactors: Structural Materials - Irradiation Studies I

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS/ASM: Nuclear Materials Committee

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Thursday AM

Room: Swan 2

March 15, 2012

Location: Swan Resort

Session Chairs: Todd Allen, University of Wisconsin - Madison; Ramprashad Prabhakaran, Idaho National Laboratory

8:30 AM Invited

Microstructures of Ferritic-Martensitic Alloys Irradiated to High Dose at High Dose Rates: *Gary Was*¹; Zhijie Jiao¹; ¹University of Michigan

9:00 AM

Irradiation Studies on Friction Stir Welded MA956 and MA754: *Ramprashad Prabhakaran*¹; J Wang²; B Miller¹; J Cole¹; I Charit³; R Mishra²; K Murty⁴; ¹Idaho National Laboratory; ²Missouri University of Science and Technology; ³University of Idaho; ⁴North Carolina State University

9:20 AM

The Use of a Local Electrode Atom Probe Method to examine the Microstructure of Zircaloy: *Brian Cockeram*¹; Lance Sneed²; M. Miller²; ¹Bechtel-Bettis; ²Oak Ridge National Laboratory

9:40 AM

Phase Stability and Elemental Redistribution under High-Dose Ion Irradiation in 14YWT Nanostructured Ferritic Alloy: *Yanwen Zhang*¹; Zihua Zhu²; Chad Parish¹; Philip Edmondson¹; Michael Miller¹; ¹Oak Ridge National Laboratory; ²Pacific Northwest National Laboratory

10:00 AM

Influence of Cr Content on Radiation Induced and Enhanced Precipitation in Neutron Irradiated Fe-Cr Model Alloys of Low Purity: Comparison with Ion Irradiation: *Philippe Pareige*¹; Slava Kuksenko¹; Cristelle Pareige¹; ¹Rouen University

10:20 AM Break

10:30 AM

Study of Ion Irradiation Effects on Microstructure of ODS Ferritic Steels by Atom Probe Tomography: *Bertrand Radigue*¹; Yves Serruys²; Olena Kalokhtina¹; Mathieu Couvrat²; Laurent Chaffron³; Fabrice Legendre²; Philippe Pareige¹; ¹GPM UMR CNRS 6634 - Université et INSA du Rouen; ²CEA Saclay - DEN - DMN - SRMP; ³CEA Saclay - DEN - DMN - SRMA - LTME

10:50 AM

Influence of Grain Boundary Character and Grain Orientation on Radiation Damage by Ion Irradiation and Implantation: *Dhriti Bhattacharyya*¹; Yongqiang Wong²; Pranesh Dayal¹; David Carr¹; Amit Misra²; Robert Harrison¹; Lyndon Edwards¹; ¹Australian Nuclear Science and Technology Organization; ²Los Alamos National Laboratory

11:10 AM

Corrosion of HT-9 in Contact with Molten Lead Bismuth Eutectic with and without Simultaneous 6 MeV Proton Irradiation
: Staffan Qvist¹; Magdalena Serrano de Caro²; Alan Bolind¹; *Yongqiang Wang*²; Mark Bourke²; Peter Hosemann¹; ¹University of California Berkeley; ²Los Alamos National Laboratory

11:30 AM

On the Stability of Nanostructured 18-Chromium ODS Steels under High Dose Ion-Irradiation: *Marie-Laure Lescoat*¹; Joël Ribis¹; Emmanuelle MARQUIS²; Yimeng CHEN²; Aurélie Gentils³; Odile Kaïtasov³; Yves SERRUYS¹; Patrick TROCELLIER¹; Arthur Motta⁴; Yann de Carlan¹; Alexandre Legris⁵; ¹CEA Saclay; ²University of Michigan; ³CSNSM, CNRS/IN2P3; ⁴Pennsylvania State University; ⁵Université de Lille 1

11:50 AM

Temperature Effects on the High Dose Radiation Resistance of Nano-Sized Clusters in Nanostructured Ferritic Alloys: *Alicia Certain*¹; Satyanarayana Kuchibhatla²; Vaithiyalingam Shutthanandan²; Chad Parish³; Todd Allen¹; David Hoelzer³; ¹University of Wisconsin-Madison; ²Pacific Northwest National Laboratory; ³Oak Ridge National Laboratory

12:10 PM

Planar Dislocations and Dislocation Channeling in Unirradiated and Irradiated Austenitic Stainless Steels: *Young Suk Kim*¹; Young Suk Kim¹; Dae Whan Kim¹; ¹Korea Atomic Energy Research Institute



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Materials Design Approaches and Experiences III: Joining and Microstructure-Property Relationships

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: High Temperature Alloys Committee, TMS: Integrated Computational Materials Engineering Committee

Program Organizers: Ji-Cheng Zhao, The Ohio State University; Akane Suzuki, GE Global Research; Deb Whitis, GE Aviation; Michael Fahrman, Haynes International Inc.; Qiang Feng, University of Science and Technology Beijing

Thursday AM
March 15, 2012

Room: Europe 11
Location: Dolphin Resort

Session Chairs: J.-C. Zhao, The Ohio State University; Warren Poole, The University of British Columbia

8:30 AM Invited

Application of Microstructure Engineering to the Heat Affected Zone of Welds: *Warren Poole*¹; *Matthias Militzer*¹; *Mehran Maalekian*¹; *UBC*

9:00 AM Invited

Weldable Materials System Design - Application of Computational Thermodynamics and Kinetics: *Sudarsanam Babu*¹; *Ohio State University*

9:30 AM

Effect of Pre-Weld Heat Treatment Environment on the Microstructure and Crack Behaviors in the Laser Repair Welded René 77 Nickel-Based Superalloy: *Huei-Sen Wang*¹; *Sian-Jih Deng*¹; *Chen Ming Kuo*¹; *I-Shou University*

9:50 AM Invited

An ICME Approach to Solder Joint Lifetime Prediction: *Michael Neilsen*¹; *Paul Vianco*¹; *Elizabeth Holm*¹; *Sandia National Laboratories*

10:20 AM Break

10:40 AM

Characterization of the Performance at High Temperature of an Incoloy 718 for Improving the Ring Production: *Martha Guerrero*¹; *Maribel de la Garza*¹; *Patricia Zambrano*¹; *Pedro Paramo*¹; *Universidad Autonoma de Nuevo Leon*

11:00 AM

Heat Treatment Effects on Creep Behavior of Directionally Solidified CM247LC Superalloy: *Ken-Tu Hsu*¹; *Huei-Sen Wang*¹; *Wei Bin He*¹; *Chen-Ming Kuo*¹; *Hui-Yun Bor*²; *Chao-Nan Wei*²; *ISU University*; ²*Chun-Shan Institute of Science and Technology*

11:20 AM

Influence of Processing Conditions on the Mechanical Properties of High-Nitrogen 18Cr-18Mn Austenitic Steels for Generator Retaining Ring: *Byoungchul Hwang*¹; *Jong-Ho Shin*²; *Tae-Ho Lee*¹; *Heon-Young Ha*¹; *Jong-Wook Lee*²; *Sung-Joon Kim*¹; *Korea Institute of Materials Science*; ²*Doosan Heavy Industries & Construction Co., Ltd.*

11:40 AM

$\gamma(\text{Ni})/\gamma'(\text{Ni}_3\text{Al})$ -d(Ni₃Nb)Eutectic Ni-Base Superalloys: The Relationship between Composition, Solidification Characteristics and Microstructure: *Mengtao Xie*¹; *Illinois Institute of Technology*

Mechanical Behavior at Nanoscale I: Thin Film and Multilayers

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee, TMS/ASM: Mechanical Behavior of Materials Committee

Program Organizers: Scott Mao, University of Pittsburgh; Julia R Greer, California Institute of Technology; Jianyu Huang, Center for Integrated Nanotechnologies; Marc Legros, CEMES-CNRS; Ting Zhu, Georgia Institute of Technology

Thursday AM
March 15, 2012

Room: Asia 1
Location: Dolphin Resort

Session Chairs: Jianyu Huang, Sandia National Laboratories; Fuqiang Yang, University of Kentucky

8:30 AM Invited

Mechanics of Low Dimensional Material for Energy Harvesting and Storage: *Reza Shahbazzian-Yassar*¹; *Hessam Ghassemi*¹; *Kasra Momeni*¹; *Anjana Asthana*¹; *Yoke Yap*¹; *Gregory Odegard*¹; *Michigan Technological University*

8:50 AM

Micro-Scale Grain Boundary Fracture in Copper and Nickel Alloys: *David Armstrong*¹; *Helen Dugdale*¹; *Angus Wilkinson*¹; *Sergio Lozano-Perez*¹; *Steve Roberts*¹; *University of Oxford*

9:10 AM

Plastic Strain Recovery in Nanocrystalline Nickel: *Marisol Koslowski*¹; *Yuesong Xie*¹; *Purdue University*

9:30 AM

Study on the Nanomechanical Properties of High Quality ZnO Microwires by Nanoindentation: *Zhi Lin*¹; *JianPing He*²; *ZhiWei Liu*²; *State Key Laboratory for Advanced Metal Materials*; *University of Science & Technology Beijing*

9:50 AM Invited

Defect and Interface Engineering in Semiconductor Nanowires: *Shadi Dayeh*¹; *Jian Wang*¹; *Jian Yu Huang*²; *Samuel Thomas Picraux*¹; *Los Alamos National Laboratory*; *Sandia National Laboratories*

10:10 AM

Deformation Hardening under Friction of Cu Samples with Different Virgin Grain Size in the Lubrication Conditions: *Alex Laikhtman*¹; *Lev Rapoport*¹; *Alexey Moshkovich*¹; *Vladislav Perflyev*¹; *Louisa Meshi*²; *Shmuel Samuha*²; *Sidney Cohen*³; *Holon Institute of Technology (HIT)*; *Ben-Gurion University of the Negev*; *The Weizmann Institute of Science*

10:30 AM Break

10:40 AM

Effect of Indentation Depth and Displacement Rate on spherical Nanoindentation of NiTi Shape Memory Alloys: *Indrani Sen*¹; *Martin Wagner*¹; *Technische Universität Chemnitz*

11:00 AM

A Versatile Microelectromechanical System for Monotonic and Fatigue Testing of Nanostructures: *Ehsan Hosseinian*¹; *Brian Allen*¹; *Bhaskar Pant*¹; *Olivier Pierron*¹; *Georgia Tech*

11:20 AM

Tribological Properties of Nanocrystalline Metallic Contacts: *Michael Chandross*¹; *Shengfeng Cheng*¹; *Sandia National Laboratories*

11:40 AM

Nanoscale Investigation of Segregation and Embrittlement in λ 149; -Fe due to Hydrogen and Grain Boundary Character: *Kiran Solanki*¹; Mark Tschopp²; Nathan Rhodes²; ¹Arizona State University; ²Mississippi State University

12:00 PM

Small Scale Mechanical Behavior of Silicon as a Function of Electronic Doping: *Jacques Rabier*¹; Rudy Ghisleni²; Jean Luc Demeenet¹; Johann Michler²; ¹CNRS; ²EMPA

12:20 PM

Three-Dimensional Dislocation Dynamic Simulations in BCC Metal Micro-Pillars: *Ill Ryu*¹; Wei Cai¹; William Nix¹; Christopher Weinberger²; ¹Stanford University; ²Sandia National Laboratories

Mechanical Behavior Related to Interface Physics: Dynamic Response of Interfaces: Experiment and Modeling

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Izabela Szułfarska, University of Wisconsin-Madison; Zhiwei Shan, Xi'an Jiaotong University

Thursday AM
March 15, 2012

Room: Oceanic 1
Location: Dolphin Resort

Session Chairs: Timothy Germann, Los Alamos National Laboratory; Xuejun Jin, Shanghai Jiao Tong University

8:30 AM Keynote

Interface Role in the Shock Response of Cu/Nb Metallic Multilayers: *Timothy Germann*¹; Ruifeng Zhang¹; Weizhong Han¹; Jian Wang¹; Shengnian Luo¹; Irene Beyerlein¹; Amit Misra¹; ¹Los Alamos National Laboratory

9:00 AM

Dynamic Thermo-Mechanical Properties of Ferroelastic Reinforced Metal Matrix Composites: *Jack Tilka*¹; Zachary Bryan¹; Jacob Jones¹; Michele Manuel¹; ¹University of Florida

9:15 AM

Effect of Film Thickness on Mechanical Properties of Free-Standing Thermoset Nanofilms by Molecular Dynamics Simulations: *Chunyu Li*¹; Alejandro Strachan¹; ¹Purdue University

9:30 AM

Meso-Scale Simulations of Interface Configuration on Shock Wave Propagation in Multilayered Ni-Al Composites: Paul Specht¹; *Naresh Thadhani*¹; Timothy Weihs²; ¹Georgia Institute of Technology; ²The Johns Hopkins University

9:45 AM Break

9:55 AM Keynote

High Temperature Twinning Correlated with Grain Growth in a Nano-Grained Co Based Alloys: *Xuejun Jin*¹; Jiayao Li¹; Yao Shen¹; ¹Shanghai Jiao Tong University

10:25 AM Keynote

Grain Boundary Mediated Deformation Mechanisms of Nanocrystalline NiFe Alloy under Cyclic and Dynamic Loading: *Yonghao Zhao*¹; S. Cheng²; Y.Z. Guo³; Y.M. Wang⁴; Y. Li¹; Q.M. Wei³; X.-L. Wang⁵; P.K. Liaw²; E.J. Lavernia¹; ¹University of California Davis; ²University of Tennessee, Knoxville, USA; ³University of North Carolina, Charlotte; ⁴Lawrence Livermore National Laboratory, Livermore; ⁵Oak Ridge National Laboratory, Oak Ridge

10:55 AM

Fracture Toughness Testing of Sub-Micron Sized Bi-Embrittled Cu Bicrystals: *Mark McLean*¹; Austin Wade¹; Masashi Watanabe¹; Rick Vinci¹; ¹Lehigh University

11:10 AM

Molecular Dynamics Simulations of Plastic Deformation of Nanocrystalline FCC and BCC Metals in Tension and Compression: *Marc Meyers*¹; Yizhe Tang¹; Eduardo Bringa²; ¹UCSD; ²U Nacional de Cuyo

11:25 AM

Effects of H Impurities on Grain Boundary Cracking and Plasticity: *Diana Farkas*¹; Martin Gamarra¹; Laura Patrick¹; ¹Virginia Tech

11:40 AM

Insights into Basal Slip Dominated Plasticity of Mg from In Situ TEM Tensile Testing: *Qian Yu*¹; Raj Mishra²; Andrew Minor¹; ¹UC Berkeley; ²General Motors Research and Development Center

Minerals, Metals and Materials under Pressure: Phase Transformations and Microstructure

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS/ASM: Phase Transformations Committee
Program Organizers: Ellen Cerreta, Los Alamos National Laboratory; Richard Hennig, Cornell University; Dallas Trinkle, University of Illinois, Urbana-Champaign; Vijay Vasudevan, Univ. Cincinnati

Thursday AM
March 15, 2012

Room: Europe 7
Location: Dolphin Resort

Session Chair: Dallas Trinkle, Univ. Illinois, Urbana-Champaign

8:30 AM Invited

Influence of Interstitial Content and Stress State of the Shock-Induced Phase Transitions in Zr, Ti, and Fe: *George Gray*¹; Ellen Cerreta¹; Larry Hull¹; Paulo Rigg¹; ¹Los Alamos National Laboratory

9:00 AM

Probing the Role of Temperature on Texture Evolution in Tantalum during Dynamic-Tensile-Extrusion: *Carl Trujillo*¹; Juan Escobedo¹; Ellen Cerreta¹; George Gray III¹; Daniel Martinez¹; ¹Los Alamos National Laboratory

9:20 AM

The Role of Interfaces on Shock-Induced Damage in Two Phase Metals: *Saryu Fensin*¹; Ellen Cerreta¹; Steven Valone¹; Steven Valone¹; George Gray¹; Adam Farrow¹; Carl Trujillo¹; ¹Los Alamos National Laboratory



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THURSDAY AM

9:40 AM

3-D Study of Microstructural Weak Links in Shock Loaded Copper Polycrystals with Incipient Spall Damage: *Andrew Brown*¹; Quan Pham¹; Kapil Krishnan¹; Pedro Peralta¹; Shengnian Luo²; Brian Patterson²; Scott Greenfield²; Darrin Byler²; Kenneth McClellan²; Aaron Koskelo²; ¹Arizona State University; ²Los Alamos National Laboratory

10:00 AM

Characterization of Near-Surface Microstructures in IN718 Alloy Laser Shock Peened with and without an Ablative Overlay: Amrinder Gill¹; *Vijay Vasudevan*¹; S.R. Mannava¹; Dong Qian¹; ¹University of Cincinnati

10:20 AM Break

10:30 AM Invited

Melting Line of Alkali Metals: Shanti Deemyad¹; ¹Cornell University

11:00 AM

Investigating the Effects of High Pressure Shock Loading on Ni-Al Mixtures Using a Laser-Accelerated Flyer Setup: *Sean Kelly*¹; Naresh Thadhani¹; ¹Georgia Institute of Technology

11:20 AM

Phase-Field Reaction-Pathway Method Coupled with Plasticity Theory of the Shock Induced Alpha-Epsilon Martensitic Transition in Iron: *Aurélien Vattré*¹; Christophe Denoual¹; ¹CEA

11:40 AM

High Pressure Phase Transitions in Layered Tin Monoselenide Crystals: Ajay Agarwal¹; *Paras Trivedi*²; Prakash Naik²; Dipesh Patel³; ¹Shree J P Arts & Science College; ²Shree J P Arts & Science College; ³V S Patel College of Arts & Science

Nanocomposites: Processing of Nanocomposites II

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Composite Materials Committee

Program Organizers: Garth Wilks, Air Force Research Laboratory; Jonathan Spowart, Air Force Research Laboratory; Meisha Shofner, Georgia Institute of Technology; John Zhanhu Guo, Lamar University

Thursday AM
March 15, 2012

Room: Swan 8
Location: Swan Resort

Session Chairs: Meisha Shofner, Georgia Institute of Technology; Frank Fisher, Stevens Institute of Technology

8:30 AM Break

8:50 AM

Structural and Thermal Stability Properties of Cellulose Nanocomposites with Polylactic Acid Matrix: *Na Lu*¹; ¹University of North Carolina at Charlotte

9:10 AM

Synthetic Process Engineered Polyaniline Nanostructures: *Xi Zhang*¹; Jiahua Zhu¹; Suying Wei¹; John Zhanhu Guo¹; ¹Lamar University

9:30 AM Invited

Nanoparticle-Enhanced Crystallization of Semicrystalline Polymer Nanocomposites: *Frank Fisher*¹; ¹Stevens Institute of Technology

10:10 AM

Processing-Structure-Property Relationships in Hydroxyapatite Nanocomposites with a Copolymer-Compatibilized Interface: *Meisha Shofner*¹; Ji Hoon Lee¹; ¹Georgia Institute of Technology

10:30 AM

Self-Healing, High Molar Mass Polymer Nanocomposites: *Julie Harmon*¹; Roger Bass²; ¹University of South Florida; ²Air Force

10:50 AM

Tacticity Effect Studies of PMMA and PMMA-QDs Composites: *Suying Wei*¹; Narendhar Anumandla¹; Jaishri Sharma¹; ¹Lamar University

11:10 AM

Thermal Properties of Hemp-High Density Polyethylene Composites: Effect of Two Different Chemical Treatments: *Na Lu*¹; Shubhashini Oza²; ¹University of North Carolina at Charlotte; ²University of North Carolina at Charlotte

11:30 AM Invited

Multifunctional Nanostructures through Functional Polymers: *Yuping Bao*¹; Soubantika Palchoudhury¹; Yaolin Xu¹; ¹The University of Alabama

12:10 PM

Organic to Inorganic Conversion Process of PDMS: *Jihoon Lee*¹; Hyun Ae Lee²; Umesh Singh³; Cheol-Woong Yang²; Hyoung Jin Cho³; Hyoungsub Kim²; ¹Sungkyunkwan University; ²Sungkyunkwan University; ³University of Central Florida

Neutron and X-Ray Studies of Advanced Materials V: Centennial: Dislocations, Strains, Deformation II

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Xun-Li Wang, Oak Ridge National Laboratory; Gernot Kosterz, ETH Zurich; Lyle Levine, National Institute of Standards and Technology; Peter Liaw, Univ of Tennessee; Yandong Wang, Beijing Institute of Technology; Brent Fultz, California Institute of Technology

Thursday AM
March 15, 2012

Room: Southern I
Location: Dolphin Resort

Funding support provided by: Office of Basic Energy Sciences, U.S. Dept. of Energy, Dr. P. Thyagarajan

Session Chairs: Peter Liaw, University of Tennessee; Klaus-Dieter Liss, Australian Nuclear Science and Technology Organisation

8:30 AM Keynote

In-Situ, Time-Resolved Diffraction Studies in Thermo-Mechanic Processing: *Klaus-Dieter Liss*¹; ¹Australian Nuclear Science and Technology Organisation

8:50 AM Invited

Dislocation Densities, Burgers Vector Populations and Slip System Activity in Different Texture Components Determined by Diffraction Peak-Profile Analysis: *Tamas Ungar*¹; ¹Eötvös University Budapest

9:10 AM

In-Situ Study of Fatigue Damage in a Ni-Based Superalloy by Synchrotron X-Ray Diffraction: *Michael Hemphill*¹; Andrew Chuang¹; Yan Gao²; Jon Almer³; Tim Hanlon²; Liang Jiang²; Peter Liaaw¹; ¹University of Tennessee; ²General Electric Global Research; ³Argonne National Lab

9:25 AM

Investigation of Hydride Phase Transformations at Dislocations in Deformed Pd Using Neutron Scattering and Advanced Computational Techniques: *Brent Heuser*¹; Hyunsu Ju¹; Dallas Trinkle¹; Douglas

Abernathy²; Terrence Udovic³; ¹University of Illinois; ²ORNL; ³NIST

9:40 AM

In-Situ Neutron Diffraction Study of Nanobainitic Steels in Conjunction with Transmission Electron Microscopy: *Khushboo Rakha*¹; Hossein Beladi¹; Saurabh Kabra²; Sean McTrusty²; Stewart Pullen²; Ilana Timokhina¹; Peter Hodgson¹; Klaus-Dieter Liss²; ¹Centre for Material and Fibre Innovation, Deakin University, Victoria 3216, Australia; ²Bragg Institute, Australian Nuclear Science and Technology Organisation, Lucas Heights, NSW 2232, Australia

9:50 AM

In-Situ Neutron-Diffraction Study of a Ferritic Superalloy during Tensile Deformation at Room and Elevated Temperatures: *Shenyang Huang*¹; Yanfei Gao¹; Ke An²; Wei Wu¹; Lili Zheng¹; Michael Rawlings³; David Dunand³; Peter Liaw¹; ¹University of Tennessee; ²Oak Ridge National Laboratory; ³Northwestern University

10:00 AM

Exploring Dislocation Source Strengths in Nanocrystalline Ni Using X-Ray Diffraction Footprints: *Lin Li*¹; Steven Van Petegem²; Helena Van Swygenhoven²; Peter Anderson¹; ¹The Ohio State University; ²Paul Scherrer Institut

10:10 AM

Time-Resolved X-Ray Tomography of Semi-Solid Alloy Deformation: *Kristina Maria Kareh*¹; Peter Lee²; Christopher Gourlay¹; ¹Imperial College London; ²The University of Manchester

10:20 AM Break

10:25 AM Invited

Investigation of Residual Stress in Key-Hole Laser Formed Weldments Measured by Neutron and Synchrotron Diffraction: *Anna Paradowska*¹; Wojciech Suder²; Stewart Williams³; T. Connolly⁴; U. Lienert⁵; ¹ISIS, Rutherford Appleton Laboratory; ²Cranfield University; ³Cranfield University; ⁴Diamond Light Source; ⁵Advanced Photon Source,

10:45 AM

Study of Embryos and Nanoscale Precipitates in a Ferritic Steel by Small Angle Neutron Scattering and Atom Probe Tomography: *Z. W. Zhang*¹; C. T. Liu²; X.-L. Wang¹; K. C. Littrell¹; M. K. Miller¹; K. An¹; B. A. Chin³; ¹Oak Ridge National Labs; ²City University of Hong Kong; ³Auburn University

11:00 AM

Effect of Oxygen Content and Processing on Deformation Modes in a Zirconium Alloy: *Christopher Cochrane*¹; Song Cai¹; Mark Daymond¹; ¹Queen's University

11:10 AM

Study the Hydrogen Induced Volume Expansion and the Embrittlement of Zr-Based Bulk Metallic Glasses: *Chih-Pin Chuang*¹; Wojciech Dmowski¹; Yun Liu²; Terrence Udovic²; Peter Liaw¹; Lu Huang³; ¹University of Tennessee; ²National Institute of Standards and Technology; ³Beihang University

11:20 AM

Characterization of Residual Stress in Laser Shock Peened IN718 SPF Alloy with X-Rays of Different Wavelengths: Amrinder Gill¹; S.R. Mannava¹; *Vijay Vasudevan*¹; Dong Qian¹; Gokul Ramakrishnan¹; Mohammed Belassel²; ¹University of Cincinnati; ²Proto Manufacturing Limited

11:30 AM

In Situ Time-of-Flight Neutron Diffraction Study of the Phase Transformation in a TC18 Titanium Alloy: *Xiaopeng Liu*¹; Ru Lin Peng²; Yandong Wang³; Shuyan Zhang⁴; Sten Johansson²; ¹Northeastern University; ²Linköping University; ³Beijing Institute of Technology; ⁴Rutherford Appleton Laboratory

11:45 AM

Non-Destructive Evaluation of Strain-Stress and Texture in Cold Drawn Tubes by Neutrons and Hard X-Rays: Adele Carradò¹; Thilo Pirling²; Robert Wimpory³; Heinz-Guenther Brokmeier⁴; *Heinz Palkowski*⁴; ¹IPCMS, UMR 7504 UDS-CNRS; ²Institut Laue-Langevin; ³Helmholtz Zentrum Berlin; ⁴Clausthal University of Technology

New Advances in Synthesis, Characterization, and Application of Layered Double Hydroxides: Session I

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee

Program Organizer: Jewel Gomes, Lamar University

Thursday AM

March 15, 2012

Room: Oceanic 2

Location: Dolphin Resort

Session Chairs: Hylton McWhinney, Prairie View A&M University; Jeanne Hossenlopp, Marquette University; Jewel Gomes, Lamar University

8:30 AM Introductory Comments Hylton McWhinney, Prairie View A&M University

8:35 AM Invited

Advances and Biochemistry of Using Layered Double Hydroxides in Treatment, Health and Wellness: *David Coker*¹; Gary Beall¹; ¹Lamar University

9:00 AM

Designing Layered Double Hydroxides for Targeted Applications: *Jeanne Hossenlopp*¹; ¹Marquette University

9:20 AM

Electrochemical Synthesis of Layer Double Hydroxides, Its Characterization, and Performance Study for Removal of Nitrate and Arsenic: Md Haider¹; *Jewel Gomes*¹; Kevin Urbanczyk²; David Coker¹; Hylton McWhinney³; George Irwin¹; Paul Bernazzani¹; ¹Lamar University; ²Sul Ross State University; ³Prairie View A&M University

9:40 AM

Enhanced Removal of Various Phosphates over Ca Based Fe-ILayered Double Hydroxide (LDH): *Guangren Qian*¹; Ji Zhi Zhou¹; Zhi Ping Xu²; Yunfeng Xu¹; Jianyong Liu¹; ¹Shanghai University; ²The University of Queensland

10:00 AM

Removal of Direct Red and Orange II Azo Dye from Synthetic Textile Water Using Electrochemically Produced Fe-LDH: *Sadia Jame*¹; Jewel Gomes¹; David Coker¹; ¹Lamar University

10:15 AM Break

10:30 AM Invited

Charge Density and Counter ion Effects on Synthesis and Thermal Decomposition Character of Hydrotalcites: *Gary Beall*¹; David Coker²; Sergio Crosby¹; Andrew Gomes²; Doanh Tran²; ¹Texas State University; ²Lamar University

10:55 AM

Microwave Synthesis and Vibrational Spectroscopy of Chemically Substituted Layered Double Hydroxides with Carbonate, Chloride and Sulfate Ions: *Anderson Dias*¹; Andriara Vieira¹; Lumena Cunha¹; ¹UFOP



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THURSDAY AM

11:15 AM

Removal of Arsenic Using Green Rust and Other Electrochemically Generated Floc: *Md Rahman*¹; Jewel Gomes¹; Kevin Urbanczyk; David Cocke¹; ¹Lamar University

11:30 AM

Formation of Layered Double Hydroxides in Self-Purification of Polynary Metal Electroplating Wastewaters for Effective Removal of Anionic Dye: *Jizhi Zhou*¹; Guangren Qian¹; Zhi Ping Xu²; Yueying Wu¹; ¹Shanghai University; ²The University of Queensland

11:45 AM

Characterization and Chemical Modification of Electrochemically Produced Layered Double Hydroxides as Nanomaterials: *Md Islam*¹; Jewel Gomes¹; Paul Bernazzani¹; ¹Lamar University

10:45 AM

Effect of Solder Thickness on Electromigration in Sn2.5Ag Solder Joints: *Woei haw Khew*¹; Chih Chen¹; ¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan 30010, Republic of China

11:05 AM

Relationship between Reliability and Effect of Solid Solution Hardening at Solder Joints: *Minoru Ueshima*¹; ¹Senju Metal Industry

11:25 AM

Current-Induced Phase Transformation Study of Ni-Sn Intermetallic Compounds in 18 \149; m Microbumps in Three-Dimensional Integrated-Circuit Packaging Using Kelvin Bump Structure: *Yuan-Wei Chang*¹; Chih Chen¹; ¹National Chiao Tung University

Pb-Free Solders and Other Materials for Emerging Interconnect and Packaging Technologies: Physical Property Effects and Responses to Current

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee
Program Organizers: Iver Anderson, Ames Laboratory; Sung Kang, IBM; Albert Wu, National Central Univ; Laura Turbini, Research in Motion; Tae-Kyu Lee, Cisco Systems; Govindarajan Muralidharan, Oak Ridge National Lab; John Elmer, Lawrence Livermore National Lab; Yan Li, Intel

Thursday AM

March 15, 2012

Room: Swan 9

Location: Swan Resort

Session Chair: To Be Announced

Recent Developments in Biological, Electronic, Functional and Structural Thin Films and Coatings: Applications to Bio, Energy and Electronic Systems

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee
Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Jian Luo, Clemson University; Xing Yang (Mark) Liu, National Research Council Canada; Nancy Michael, University of Texas at Arlington; Roger Narayan, University of North Carolina and North Carolina State University; Choong-un Kim

Thursday AM

March 15, 2012

Room: Swan 10

Location: Swan Resort

Session Chairs: Roger Narayan, University of North Carolina and North Carolina State University; Sufian Abedrabbo, University of Jordan

8:30 AM Invited

Critical Studies to Evaluate the Events Controlling TMF Reliability of Sn-Ag Solder Joints: Stephanie Bergman¹; Andre Lee¹; *K.N. Subramanian*¹; ¹Michigan State University

8:55 AM

In-Situ Mechanical Assessment of Thermomechanically Fatigued POSS-Added Pb-Free Nanocomposite Solder Joints: Stephanie Bergman¹; *Andre Lee*¹; K.N. Subramanian¹; ¹Michigan State University

9:15 AM

Experimental and CPFEM Investigation of Stress Distribution in Shear Tests and Thermal Cycling in Lead-Free Solder Joints: *Payam Darbandi*¹; Bite Zhou¹; Farhang Pourboghra¹; Thomas Bieler¹; Tae Kyu Lee¹; Kuo Chuan Liu¹; ¹MSU

9:35 AM

Thermal and Mechanical Characterization of Cu/ Cu-In Solder Joints for Thermal Interface and Interconnect Applications: Effects of Interfacial Layers: *Jia Liu*¹; Praveen Kumar¹; Indranath Dutta¹; Rajen Sidhu²; ¹Washington State University; ²Intel Corporation

9:55 AM Break

10:05 AM

Wetting Behavior and Interfacial Reaction between New Electrolytic Ni-Pd Surface Finish/Sn-3.0Ag-0.5Cu Solder Joints: *Cheng Ying Ho*¹; Jenq Gong Duh¹; ¹National Tsing Hua University

10:25 AM

Analytical Modeling of Diffusion and Growth Processes in Sn-Ag Alloy Systems: *Sri Chaitra Chavali*¹; Ganesh Subbarayan¹; Mysore Dayananda¹; ¹Purdue University

8:30 AM Introductory Comments

8:35 AM

Multilayer Roll Bonded Sandwich: Processing, Mechanical Performance and Bioactive Behavior: *Adele Carrao*¹; Heinz Palkowski²; ¹IPCMS, UMR 7504 UDS-CNRS; ²Clausthal University of Technology

9:05 AM

Effect of Multiple Quaternary Ammonium Ion Salts on the Performance of Heparin Ionic Complex Coating: *Narayana Garimella*¹; Bartley Griffith¹; Zhongjun Wu¹; ¹University of Maryland School of Medicine

9:35 AM

Bio-Inspired Organic/Inorganic Multi-Layer Coating Synthesized by RF-Magnetron Sputtering and Pulse Laser Deposition: Yu-Chen Chan¹; Hsien-Wei Chen¹; Li-Wei Ho¹; Jyh-Wei Lee¹; *Po-Yu Chen*¹; Jenq-Gong Duh¹; ¹National Tsing Hua University

10:05 AM

Nanomechanical Properties of Polyethylene Glycol Coatings on Flat Gold Substrates: *Frank DelRio*¹; Gheorghe Stan¹; Robert MacCuspie¹; Robert Cook¹; ¹National Institute of Standards and Technology

10:35 AM Break

10:50 AM

Doping and Co-Doping of Bandgap-Engineered ZnO Films for Solar Driven Hydrogen Production: *Sudhakar Shet*¹; Nuggehalli Ravindra²; Yanfa Yan¹; Mowafak Al-Jassim¹; ¹National Renewable Energy Laboratory; ²New Jersey Institute of Technology

11:20 AM

Characterization of Thin Film Photovoltaic Microstructure and Correlation with Conversion Efficiency: *Matt Nowell*¹; ¹EDAX-TSL

11:50 AM

Magnetic Field Assisted Heterogeneous Device Assembly: *Vijay Kasisomayajula*¹; Michael Booty¹; Anthony Fiory¹; Nugehalli Ravindra¹; ¹New Jersey Institute of Technology

12:10 PM

Study on Organic Thermal Mode Photo-Resist for the Application of Nano-Lithography: *Der-Ray Huang*¹; ¹NDHU

Solid-State Interfaces II: Toward an Atomistic-Scale Understanding of Structure, Properties, and Behavior through Theory and Experiment: Interface Dynamics, Oxidation

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Xiang-Yang Liu, Los Alamos National Lab; Douglas Spearot, University of Arkansas; Guido Schmitz, University of Münster; David Seidman, Northwestern University

Thursday AM
March 15, 2012

Room: Oceanic 7
Location: Dolphin Resort

Funding support provided by: Los Alamos National Laboratory

Session Chairs: Douglas Spearot, University of Arkansas; Douglas Medlin, Sandia National Labs

8:30 AM Invited

Shrinking Island Grains: Mobilities and Driving Forces: David Olmsted¹; *Mark Asta*¹; Colin Ophus²; Tamara Radetic³; Ulrich Dahmen²; ¹University of California, Berkeley; ²Lawrence Berkeley National Laboratory; ³University of Belgrade

9:00 AM

The Dynamics of Shrinking Grains: Molecular-Dynamics Simulations and In-Situ Electron Microscopy Studies of Shrinkage, Shape, Rotation and Dislocation Production: *David Olmsted*¹; Tamara Radetic²; Colin Ophus³; Ulrich Dahmen³; Mark Asta⁴; ¹University of California, Berkeley; ²University of Belgrade; Lawrence Berkeley National Laboratory; ³Lawrence Berkeley National Laboratory; ⁴Lawrence Berkeley National Laboratory; University of California, Berkeley

9:20 AM

Coupled Motion of Interstitial-loaded Grain Boundaries in Bcc Tungsten as a Possible Radiation Damage Healing Mechanism under Fusion Reactor Conditions: *Valery Borovikov*¹; Xian-Zhu Tang¹; Danny Perez¹; Xian-Ming Bai²; Blas Uberuaga¹; Arthur Voter¹; ¹LANL; ²INL

9:40 AM

Calculation of Grain Boundary Mobility in Slow-Moving Nickel Bicrystals: *Shawn Coleman*¹; Stephen Foiles²; Douglas Spearot¹; ¹University of Arkansas; ²Sandia National Laboratories

10:00 AM

The Mobility and Grain Boundaries Study of Austenite-Ferrite Interface in Pure Fe from Molecular Dynamics Simulations: *Huajing Song*¹; Jeff Hoyt¹; ¹McMaster University

10:20 AM Break

10:25 AM

Thermally Activated Avalanches: Jamming and the Progression of Needle Domains: *Xiangdong Ding*¹; E.K.H. Salje²; Turab Lookman³; Avadh Saxena³; ¹Xi'an Jiaotong University; ²University of Cambridge; ³Los Alamos National Laboratory

10:45 AM

Atomic-Scale Modeling of the Mobility of Boundaries of Deformation Twins in Alpha-Iron: *Jinbo Yang*¹; Yuri Osetsky¹; Roger Stoller¹; ¹ORNL

11:05 AM

First Principles Study of Ti (10-12) Twin Boundary: Interactions with Oxygen Interstitials and Screw Dislocations: *Maryam Ghazisaedi*¹; Dallas Trinkle¹; ¹University of Illinois at Urbana-Champaign

11:25 AM Invited

Insights into the Oxidation Behavior of Alloys: Oxide/Metal Interfaces at the Atomic Scale: *Emmanuelle Marquis*¹; ¹University of Michigan

11:55 AM

HR-STEM Investigation of Cu/SnO₂ Interfaces in the Internal Oxidation Zone of a CuSn9 Alloy: *Xavier Sauvage*¹; Megha Dubey¹; Samuel Jouen¹; Béatrice Hannoyer¹; ¹University of Rouen, CNRS

Titanium: Advances in Processing, Characterization and Properties: General Abstracts

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: Titanium Committee

Program Organizers: Adam Pilchak, US Air Force Research Laboratory; Christopher Szczepanski, US Air Force Research Laboratory; Vasisht Venkatesh, Pratt & Whitney

Thursday AM
March 15, 2012

Room: Oceanic 3
Location: Dolphin Resort

Session Chair: Alexander Donchev, Dechema

8:30 AM

Efficient Oxidation Protection of Ti- and TiAl-alloys by Fluorine Treatments: *Alexander Donchev*¹; Michael Schütze¹; Rossen Yankov²; Andreas Kolitsch²; ¹DECHEMA; ²HZDR

8:50 AM

Characteristics and Wear Performance of Nitrided Ti6Al7Nb: *Farid Siyahjan*¹; ¹Istanbul Technical University

9:10 AM

Characterization of Texture Development in Multi-Layered Ti-Al-Nb Sheets Processed by Accumulative Roll Bonding at Different Rolling Speeds: *Liming Zhou*¹; Viola Acoff¹; ¹The University of Alabama

9:30 AM

Ti-TiAl₃ Metallic-Intermetallic Laminate Composites Processed Using Accumulative Roll Bonding: *Derrick Stokes*¹; Xiu-Ren Bu²; Jennifer Conway¹; Stan Jones¹; Viola Acoff¹; ¹The University of Alabama; ²Clark Atlanta University

9:50 AM

Composition Analysis of Diffusion Bonded \square -TiAl Intermetallic: TiAlV Alloy Interface by Using STEM: *Sivagnanapalani P*¹; Gouthama .¹; M Sujata²; ¹IIT Kanpur; ²National Aerospace Laboratories

10:10 AM

Effect of Erbium Addition on Microstructure of As-Cast Ti-22Al-25Nb Alloy: *Jingru Dai*¹; Huimin Lu¹; Zhijin Cai¹; ¹Beihang University



TMS 2012

141st Annual Meeting & Exhibition

THURSDAY AM

10:30 AM Break

10:40 AM

Titanium Coatings Using Cold Spray: *Phillip Leyman*¹; Rob Hrabec²; Brian James³; Christian Widener⁴; ¹Army Research Laboratory; ²H.F. Webster Inc.; ³GS-12, Supervisor AF Engineering Technical Services; ⁴South Dakota School of Mines and Technology

11:00 AM

Novel Surface Coating Techniques for Titanium Alloys: *Mingxing Zhang*¹; Shoumou Miao¹; ¹The University of Queensland

11:20 AM

Fracture Behaviors of TiN and TiN/Ti Multilayer Coatings on Ti Substrate during Nanoindentation
: *Yong Sun*¹; Cheng Lu¹; Anh Kiet Tieu¹; Yue Zhao¹; Hongtao Zhu¹; Kuiyu Cheng¹; Charlie Kong²; ¹University of Wollongong; ²University of New South Wales

11:40 AM

Deformation Mechanism in Nanoindentation of Ti63.375Fe34.125Sn2.5 Alloy: *Kuiyu Cheng*¹; Cheng Lu¹; Kiet Tieu¹; Laichang Zhang²; Yong Sun¹; ¹University of Wollongong; ²The University of Western Australia

T.T. Chen Honorary Symposium on Hydrometallurgy, Electrometallurgy and Materials Characterization: Characterization

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee

Program Organizers: Shijie Wang, Rio Tinto Kennecott Utah Copper; J. E. Dutrizac, CANMET; Michael Free, University of Utah; J. Y. Hwang, Michigan Technological University; Daniel Kim, Rio Tinto Kennecott Utah Copper

Thursday AM
March 15, 2012

Room: Oceanic 5
Location: Dolphin Resort

Funding support provided by: Rio Tinto Kennecott Utah Copper, ASARCO, and Freeport McMoRan

Session Chair: Jaroslav Drellich, Michigan Technological University

8:30 AM

Characterization of Nanocrystalline SnO₂:F Thin Films Prepared by the Spray Pyrolysis Technique: *Shadia Ikhmayies*¹; ¹Al Isra University

8:50 AM

Characterization of the Orthotropic Elastic Constants of a Micronic Woven Wire Mesh through Experiments and Modeling: *Steven Kraft*¹; Ali Gordon¹; ¹University of Central Florida

9:10 AM

Complex Impedance Plots of CdS:In Thin Films Prepared by the Spray Pyrolysis Technique: *Shadia Ikhmayies*¹; Riyad Ahmad-Bitar²; ¹Al Isra University; ²University of Jordan

9:30 AM

Characterization of Mexico Magnetic Concentrate Samples for Trace Elements Ni, Cu, Zn, S and P: *Mingming Zhang*¹; ¹ArcelorMittal Global R&D

9:50 AM Break

10:10 AM

Preparation and Characterization of High-Magnetization Microspheres of Fe₃O₄ Encapsulated with SiO₂ and TiO₂ Layers: *Nan Zhang*¹; Gaifeng Zue¹; Shangchao Liu¹; Benquan Fu¹; ¹Research and Development Center of Wuhan Iron & Steel Group Corp.

10:30 AM

Characterization of Amorphous Vacuum-Evaporated SnO₂ Thin Films: *Shadia Ikhmayies*¹; ¹Al Isra University

10:50 AM

Preparation of β-Diketone Modified Silica Gel and its Application to the Removal of Heavy Metal Ions from Industrial Wastewater: *Nan Zhang*¹; Gaifeng Xue¹; Lei Zhang¹; Pu Liu¹; Lina Wang¹; ¹Research and Development Center of Wuhan Iron & Steel Group Corp.

11:10 AM

Elastic Modulus and Density Dependence on the Diameter of Piassava Fibers: *Felipe Lopes*¹; Alice Bevitoni²; Isabela Silva²; Renan Carreiro²; Denise Nascimento²; Sergio Monteiro²; ¹IME; ²UENF

T.T. Chen Honorary Symposium on Hydrometallurgy, Electrometallurgy and Materials Characterization: Processing and Properties II

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee

Program Organizers: Shijie Wang, Rio Tinto Kennecott Utah Copper; J. E. Dutrizac, CANMET; Michael Free, University of Utah; J. Y. Hwang, Michigan Technological University; Daniel Kim, Rio Tinto Kennecott Utah Copper

Thursday AM
March 15, 2012

Room: Oceanic 4
Location: Dolphin Resort

Funding support provided by: Rio Tinto Kennecott Utah Copper, ASARCO, and Freeport McMoRan

Session Chair: JY James Hwang, Michigan Technological University

8:30 AM

Leaching of Lithium Cobalt Dioxide Using Citric-Thiosulfate Solutions: *Alejandro Alonso*¹; Gretchen Lapidus-Lavine¹; Lizeth Alvarado¹; ¹Universidad Autonoma Metropolitana

8:50 AM

Hydrometallurgical Purification from Leach Liquor of Printed Circuit Board with Cyanex 272: *Adriana Santanilla*¹; Viviane Tavares de Moraes¹; Jorge Alberto Soares Tenorio¹; Denise Crocce Romano Espinosa¹; ¹Polytechnic School of University of São Paulo

9:10 AM

Leaching of Chalcopyrite Concentrate with Organic Ligand Compounds: *Oscar Solis-Marcial*¹; Gretchen Lapidus-Lavine¹; ¹Universidad Autonoma Metropolitana-Iztapalapa

9:30 AM

The Electrochemical Behavior of Electro-Deoxidation Process of Ilmenite Concentrate in Molten Salt: *Xuyang Liu*¹; Meilong Hu¹; Chenguang Bai¹; Xuewei Lv¹; ¹Chongqing University

9:50 AM Break**10:10 AM**

Vanadium Extraction from High Calcium-Content Vanadium Slag by Calcification Roasting: *Hong-Yi Li*¹; Ning Wang¹; Bing Xie¹; ¹Chongqing University

10:30 AM

The Kinetic Investigation of the Dissolution Of Powellite in Oxalic Acid Solutions: *Sedat Ilhan*¹; Ahmet Kalpakli¹; Cem Kahruman¹; Ibrahim Yusufoglu¹; ¹Istanbul University

10:50 AM

Metallurgical Characterization of Waspaloy Presenting Variations on Chemical Composition, Grain Size, and Hardness: *Miguel Neri*¹; Alberto Martinez -Villafañe¹; Caleb Carreño¹; Octavio Covarrubias-Alvarado²; Alma Gonzalez-Escarcega¹; ¹CIMAV, S.C.; ²FRISA AEROSPACE S.A. DE C.V.

11:10 AM

Recent Trends in the Processing of Complex Sulphide Ores: *Sarveswara Rao Katragadda*¹; (Retd.) IMMT (CSIR)

11:30 AM

Biosorption Characteristics of Pb(II) from Aqueous Solution onto Poplar Cotton: *Kai Huang*¹; Shuanglong Du¹; Ting Luo¹; Tao Gui¹; Yifan Xiu¹; Hongmin Zhu¹; ¹University of Science and Technology Beijing

Ultrafine Grained Materials VII: Applications and Transitions

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Xiaoxu Huang, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; Hyoung Seop Kim, POSTECH; Terence Langdon, University of Southern California; Terry Lowe, Manhattan Scientifics, Inc.; Ruslan Valiev, Ufa State Aviation Technical University; Xiaolei Wu, Institute of Mechanics, Chinese Academy of Sciences; Michael Zehetbauer, University of Vienna

Thursday AM
March 15, 2012

Room: Swan 5
Location: Swan Resort

Session Chairs: Terence Langdon, University of Southern California; Aibin Ma, North Carolina State University; Suveen Mathaudhu, U.S. Army Research Office; Indranil Roy, Schlumberger

8:30 AM Introductory Comments Young Scientist Award Presentation**8:35 AM Invited**

Exceptional Mechanical and Functional Properties of Ultrafine-Grained NbZr Biomedical Alloys: *Ibrahim Karaman*¹; Hans Maier²; Gencaga Purcek³; Felix Rubitschek²; Thomas Niendorf²; ¹Texas A&M University; ²University of Paderborn; ³Karadeniz Technical University

8:55 AM

Electrochemical Corrosion of Bulk Cryomilled UFG Al5083 in Contrast to its Coarse Grained Counterpart in Aerated 3.5wt% NaCl Solution: *Indranil Roy*¹; John Meng²; Enrique Lavernia³; Farghalli Mohamed⁴; ¹Schlumberger; ²Honeywell Corrosion Solutions; ³University of California, Davis; ⁴University of California, Irvine

9:10 AM

Microstructural Aspects of Enhancing Strength and Ductility of Ultra-Fine Grained Ti Rods Processed by ECAP-Conform: *Irina Semenova*¹; Georgy Raab¹; Alexander Polyakov¹; Ruslan Valiev¹; Terry Lowe²; ¹Ufa State Aviation Technical University; ²Manhattan Scientifics

9:25 AM Invited

Potential of UFG Materials as High Performance Penetrator Materials: *Kyung-Tae Park*¹; Lee Ju Park²; Hyung Won Kim²; Chong Soo Lee³; ¹Hanbat National University; ²Agency for Defense Development; ³POSTECH

9:45 AM

Study of a New SPD technique: High Pressure Tube Twisting (HPTT): *Roxane Arruffat*¹; Mandana Arazaghi²; Arnaud Pougis¹; Jean Jacques Fundenberger¹; Laszlo Toth¹; ¹University Paul Verlaine; ²Institut PPRIME, UMR 6617 CNRS,

10:00 AM

SPD Procedure and High Performance of Ultrafine-Grained Cu-Mg Alloy for Electrical Railway: *Ai-Bin Ma*¹; Chengcheng Zhu¹; Jinghua Jiang¹; Dan Song¹; Wenyong Xu¹; ¹Hohai University

10:15 AM Break**10:30 AM**

Twenty-five Years of Severe Plastic Deformation: Recent Developments in Evaluating the Degree of Homogeneity through the Thickness of Disks Processed by High-Pressure Torsion: Megumi Kawasaki¹; Roberto Figueiredo²; *Terence Langdon*¹; ¹Univ of Southern California; ²Federal Univ of Minas Gerais

10:45 AM

Anti-Corrosion Behavior of Ultrafine-Grained Al-26wt% Si Alloy Fabricated by ECAP: *Jinghua Jiang*¹; Aibin Ma²; Dan Song²; Jun Shi²; Kaile Wang²; Donghui Yang²; Jianqing Chen²; ¹hohai university; ²Hohai University

11:00 AM

Ultrafine-Grained Thermoelectrics Processed by HPT Featuring Enhanced ZT Values: *Michael Zehetbauer*¹; Gerda Rogl¹; Peter Rogl¹; Ernst Bauer²; Daria Setman¹; Jelena Horky¹; Erhard Schafner¹; ¹University of Vienna; ²Vienna University of Technology

11:15 AM Invited

Application of High-Pressure Sliding for Bismuth-Telluride Thermoelectric Materials: Kiyonari Tazoe¹; Kanako Mitarai¹; Takahiro Hayashi²; Shinji Munetoh¹; *Zenji Horita*¹; ¹Kyushu University; ²Yamaha Corporation

11:35 AM

Application of High-Pressure Torsion to Ceramic-Based Materials: *Kaveh Edalati*¹; Zenji Horita¹; ¹Kyushu University

11:50 AM

Microstructure and Mechanical Properties of Thixomolded Mg Alloys After Thermomechanical Processing: *Bilal Mansoor*¹; Raymond Decker²; Sanjay Kulkarni²; Steve LeBeau²; Marwan Khraisheh¹; ¹Masdar Institute of Science and Technology, Abu Dhabi, UAE; ²Thixomat Inc.

12:05 PM Invited

Development of Nanostructured Coating via Electro-Chemical Method: *Young Gun Ko*¹; Dong Hyuk Shin²; ¹Yeungnam University; ²Hanyang University

12:25 PM

Equal Channel Angular Extrusion of GLIDCOP for use in High-Field Pulsed Magnet Applications: Ryan Need¹; *David Mutnick*¹; Adriana Tudela¹; Weston Lee¹; David Alexander¹; Robert Field¹; Charles Swenson¹; ¹Los Alamos National Laboratory

12:40 PM Concluding Comments



3rd International Symposium on High Temperature Metallurgical Processing: Pelletizing and Raw Materials Processing

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Energy Committee, TMS: Pyrometallurgy Committee

Program Organizers: Tao Jiang, Central South University; Jiann-Yang Hwang, Michigan Technological University; Patrick Masset, TU Freiberg; Onuralp Yucel, Istanbul Technical University; Rafael Padilla, University of Concepcion; Guifeng Zhou, Wuhan Iron and Steel

Thursday PM
March 15, 2012

Room: Southern II
Location: Dolphin Resort

Session Chairs: Ender Keskinilic, Atilim University; Guanghui Li, Central South University

2:00 PM

Developing Cost-Effective Air Separation Plants for the Mining and Mineral Processing Industry: *Goutam Shahani*¹; ¹Linde Engineering

2:15 PM

Effects of Sodium Salts-Modified Paigeite on Dephosphorization of High-Phosphorus Oolitic Hematite during Reduction: *Guanghui Li*¹; Ting Lei¹; Tao Jiang¹; Mingjun Rao¹; ¹School of Minerals Processing and Bioengineering, Central South University

2:30 PM

Study of Certain Parameters in Laboratory-Scale Smelting of Sivrihisar Laterite Ores of Turkey: *Ender Keskinilic*¹; Saeid Pournaderi²; Ahmet Geveci²; Yavuz A. Topkaya²; ¹Atilim University; ²Middle East Technical University

2:45 PM

Dephosphorization Technology of High Phosphorus Oolitic Hematite in Rotary Hearth Furnace Direct Reducing Process: *Hongliang Han*¹; *Dongping Duan*¹; Jiwei Zhao¹; ¹Institute of Process Engineering, Chinese Academy of Sciences

3:00 PM

Effect of Basicity and MgO on the Pelletizing of Specularite Concentrate: *De Qing Zhu*¹; Jinliang Zhang¹; Jian Pan¹; *Zhao Qiang*; ¹Central South University

3:15 PM

Effects of MHA Binder on Roasting Behaviors of Oxidized Pellets from Specularite Concentrate: *Youlian Zhou*¹; *Yuanbo Zhang*¹; Tao Jiang¹; Guanghui Li¹; Daoyuan Zhang¹; ¹Central South University

3:30 PM Break

3:40 PM

A Study of Carbon-Burdened and Cold-Bonded Pelletizing-Electrosmelting Process Disposing Low-Grade Manganese Ore: *Zhao Qiang*¹; ¹Changsha Research Institute of Mining and Metallurgy

3:55 PM

The Characteristics of Roasting of Magnesium Pellets and Roasting Strengthening: *Xiaohui Fan*¹; Luben Xie¹; Min Gan¹; Xuling Chen¹; Lishun Yuan¹; ¹Central South University

4:10 PM

Research on Dephosphorization of Complex and Refractory Oolite Hematite Ore: *Chaoying Qi*¹; Tiejun Chun¹; ¹Central South University

4:25 PM

Separation of Iron from Zinc Calcine by Magnetic Roasting and Dressing: *Ning Peng*¹; *Bing Peng*¹; Liyuan Chai¹; Mi Li¹; Jiming Wang¹; ¹Central South University

4:40 PM

Study on Mechanism of Limonite Granulation Gas-Based Roasting-Magnetic Separation Techniques: *Zhucheng Huang*¹; Shiyu Tian¹; Tao Jiang¹; ¹Central South University

4:50 PM Concluding Comments

Aluminum Reduction Technology: Modelling II and Measurement

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee

Program Organizer: Olivier Martin, Rio Tinto Alcan

Thursday PM
March 15, 2012

Room: Southern III
Location: Dolphin Resort

Session Chair: Jianhong Yang, Chalco

2:00 PM

Modeling Cathode Cooling Due to Power Interruption: *Marc Dupuis*¹; Alton Tabereaux²; ¹GeniSim; ²Consultant

2:20 PM

Modeling the Mass and Energy Balance of Different Aluminium Smelting Cell Technologies: *Vanderlei Gusberti*¹; *Dagoberto Severo*¹; Barry Welch²; Maria Skyllas-Kazacos²; ¹CAETE Engenharia - Brazil; ²School of Chemical Engineering - UNSW - Australia

2:40 PM

Current Efficiency Predictive Model and Its Calibration and Validation: *Zhiming Liu*¹; Wangxing Li²; Qingjie Zhao²; Jiemin Zhou¹; Yueyong Wang²; ¹School of Energy Science and Engineering Central South University; ²Zhengzhou Research Institute CHALCO Ltd.

3:00 PM

Wireless and Non-Contacting Measurement of Individual Anode Currents in Hall-Héroult Pots; Experience and Benefits: *James Evans*¹; Nobuo Urata²; ¹University of California, Berkeley & Wireless Industrial Technologies; ²Alumilab and Wireless Industrial Technologies

3:20 PM Break

3:40 PM

Impacts of Anode Set on the Energy Re-distribution of PB Aluminum Smelting Cells: *Cheuk-Yi Cheung*¹; Chris Menictas¹; Jie Bao¹; Maria Skyllas Kazacos¹; Barry Welch¹; ¹The University Of New South Wales

4:00 PM

Dimensional Analysis in Cold Water Model Experiments of New Cathode Structure Aluminum Cell: *Liu Yan*¹; Zhang Ting'an¹; Li Chong¹; Zhao Qiuyue¹; Wang Shuchan¹; Feng Naixiang¹; He Jicheng¹; ¹Northeastern University

4:20 PM

Flow Field Comparison between Traditional Cell and New Structure Cell by Chaclo by CFD Method: *Zhiming Liu*¹; *Fengqin Liu*¹; Yueyong Wang¹; ¹Zhengzhou Research Institute of Chalco

Bulk Metallic Glasses IX: Other Related Alloys and Properties

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

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

Thursday PM
March 15, 2012

Room: Swan 6
Location: Swan Resort

Session Chairs: Oleg Senkov, UES, Inc.; Yuri Petrusenko, National Science Center - Kharkov Institute of Physics & Technology

2:00 PM Invited

New Refractory High Entropy Alloys: *Oleg Senkov*¹; Svetlana Senkova¹; Daniel Miracle¹; Christopher Woodward¹; ¹Air Force Research Laboratory

2:20 PM

Disordered and Weakly-Ordered Solid-Solution Phases in the High-Entropy Alloy System of Al-Co-Cr-Cu-Fe-Ni: *Louis Santodonato*¹; Zhi Tang²; Andrew Chuang²; Peter Liaw²; ¹ORNL and UT; ²University of Tennessee

2:30 PM Invited

Properties Optimization of High-Entropy and Amorphous Alloys by Alloying and Multiple Processing: *Yong Zhang*¹; ¹University of Science and Technology Beijing

2:50 PM Invited

High-Entropy Carbides Based on High-Entropy Alloys: Yu-An Yeh¹; Ming-Hung Tsai²; Jien-Wei Yeh¹; ¹National Tsing Hua University; ²North Carolina State University

3:10 PM Invited

Accumulation and Recovery Processes in a High-Entropy Alloy Irradiated with 2.5 MeV Electrons: *Yuri Petrusenko*¹; Alexander Bakai¹; Valeriy Borysenko¹; Eduard Mayevsky¹; Peter K. Liaw²; Gongyao Wang²; Jien-Wei Yeh³; ¹National Science Center - Kharkov Institute of Physics & Technology; ²Department of Materials Science and Engineering, The University of Tennessee; ³Department of Materials Science and Engineering, National Tsing Hua University

3:30 PM

Spark Plasma Sintering of Fe-Based Bulk Metallic Glasses: *Sandip Harimkar*¹; Ashish Singh¹; ¹Oklahoma State University

3:40 PM Break

3:55 PM Invited

Formation of HfW₂ in Mechanically Alloyed W-Based Alloy Systems: *Laszlo Kecskes*¹; Anthony Roberts¹; Kristopher Darling¹; ¹US Army Research Laboratory

4:15 PM

Manifestation of Short-Range Order, Medium-Range Order, and Structure Defects in Bulk Metallic Glasses: *Yuri Petrusenko*¹; Alexander Bakai¹; Ivan Neklyudov¹; Igor Mikhailovskij¹; Sergij Bakai¹; Peter K. Liaw²; Gongyao Wang²; Qingming Feng²; Tao Zhang³; Lu Huang Huang³; Zengqian Liu³; ¹National Science Center - Kharkov Institute of Physics & Technology; ²Department of Materials Science and Engineering, The University of Tennessee; ³School of Materials Science and Engineering, Beijing University of Aeronautics and Astronautics

4:25 PM

Structural Relaxation in Zr-based BMGs Viewed from Potential Energy Landscape: *Osami Haruyama*¹; Hiroyuki Sawada¹; Yoshihiko Yokoyama²; Kohichi Tsuchiya³; Kazumasa Sugiyama²; ¹Tokyo University of Science; ²Institute of Materials Research, Tohoku University; ³National Institute of Materials Research

4:35 PM

Investigation of Porous Zr-Based Bulk Metallic Glass: *Junhua You*¹; ¹Shenyang University of Technology

Bulk Metallic Glasses IX: Structures and Other Properties II

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee

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

Thursday PM

March 15, 2012

Room: Swan 1

Location: Swan Resort

Session Chairs: Jeff De Hosson, Univ of Groningen; Hongbin Bei, Oak Ridge National laboratory

2:00 PM Invited

Controlled Nanocrystallization of a Bulk Metallic Glass in the Zr-Al-Cu-Ni-Co System – Structure, Properties and Ways to New Materials Design: *Rainer Wunderlich*¹; Arnaud Caron¹; Hans-Joerg Fecht¹; ¹Universitaet Ulm

2:20 PM

Magnetocaloric Effect of Fe-Based Amorphous Metals: *Anja Waske*¹; Björn Schwarz¹; Norbert Mattern¹; Konstantin Skokov¹; Jürgen Eckert¹; ¹IFW Dresden

2:30 PM Invited

Work Hardening of High Strength Nanocrystalline Ni-W Alloys: *Tohru Yamasaki*¹; Kazutaka Fujita²; ¹University of Hyogo; ²Ube National College of Technology

2:50 PM

Medium Range Order Correlations in Liquid and As-Quenched Al-Tb System: *Eren Kalay*¹; Matthew Kramer²; Tuba Demirtas¹; Merve Gencl¹; Jinwoo Hwang³; Paul Voyles⁴; ¹METU; ²Ames Laboratory US DOE; ³University of California, Santa Barbara; ⁴University of Wisconsin, Madison

3:00 PM Invited

Plasticity of BMG with Shear Bands-Sized Sample: *Scott Mao*¹; ¹University of Pittsburgh

3:20 PM

Hydrogen Solubility and Permeability of Ni-Nb-Zr Amorphous Alloy: *Narendra Pal*¹; Steve Paglieri²; Dhanesh Chandra¹; Sang-Mun Kim¹; Wen-Ming Chien¹; Anjali Talekar¹; Ted Flanagan³; Michael Dolan⁴; ¹University of Nevada, Reno; ²TDA Research Inc.; ³University of Vermont; ⁴Commonwealth Scientific and Industrial Research Organisation

3:30 PM Break

3:45 PM Invited

Understanding Mechanical Properties of Bulk Metallic Glasses Using Nanoindentation Pop-In Experiment: *Hongbin Bei*¹; Yanfei Gao²; ¹Oak Ridge National laboratory; ²University of Tennessee/Oak Ridge National Laboratory



TMS 2012

141st Annual Meeting & Exhibition

THURSDAY PM

4:05 PM

Sliding Wear Behavior of Cu50Hf41.5-xAl8.5Yx (x = 0, 2, 5, 8, 10 at. %) Bulk Metallic Glass: *Dharma Maddala*¹; Rainer Hebert¹; ¹University of Connecticut

4:15 PM

Ultra-High Fracture Strength and Elongation to Failure of Submicron-Sized Metallic Glasses: *Lin Tian*¹; Yong-Qiang Cheng²; Cheng-Cai Wang¹; Zhi-Wei Shan¹; Ju Li³; Xiao-Dong Han⁴; Jun Sun¹; Evan Ma²; ¹CAMP-Nano, Xi'an Jiaotong University; ²Department of Materials Science and Engineering, Johns Hopkins University; ³Department of Nuclear Science and Engineering and Department of Materials Science and Engineering, MIT; ⁴Institute of Microstructure and Property of Advanced Materials, Beijing University of Technology

4:25 PM

Smaller is Stronger in Amorphous Metals: *Chengcai Wang*¹; Zhiwei Shan¹; Jun Sun¹; Ju Li²; Evan Ma³; ¹Xi'an Jiaotong University; ²Massachusetts Institute of Technology; ³Johns Hopkins University

4:35 PM

The Correlation between Glass Formation and Hardness of the Amorphous Phase: *Zhitao Wang*¹; Kaiyang Zeng¹; Yi Li¹; ¹National University of Singapore

4:45 PM

Atomic Packing and Its Correlation with Glass Transition in Metallic Glasses: *Xiong-Jun Liu*¹; Zhao-Ping Lu¹; Xidong Hui¹; C. T. Liu²; ¹University of Science and Technology Beijing; ²City University of Hong Kong

4:55 PM

Amorphous Phase Separation in a Bulk Metallic Glass of Negative Heat of Mixing: *Si Lan*¹; Yeuk Lan Yip¹; Man Tat Lau¹; Hin Wing Kui¹; ¹Chinese University of Hong Kong

Characterization of Minerals, Metals, and Materials: Characterization of Ferrous Metals II

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Materials Characterization Committee

Program Organizers: Jiann-Yang Hwang, Michigan Technological University; Sergio Montero, State University of North Rio De Janeiro; Chenguang Bai, Chongqing University; John Carpenter, US Department of Energy; Donato Firrao, Politecnico di Torino; Byoung-Gon Kim, Korea Institute of Geoscience & Mineral Resources; Mingdong Cai, Schlumberger

Thursday PM

March 15, 2012

Room: Europe 6

Location: Dolphin Resort

Session Chairs: Mingming Zhang, ArcelorMittal Global R&D; Zhiwei Peng, Michigan Technological University

2:00 PM

Comparison of Creep Life Assessment between Tin-Based Lead-Free Solders and Lead Solders: *Kenji Monden*¹; ¹Denki Kagaku Kogyo K.K.

2:15 PM

Correlationship between JIC and Equivalent Fracture Strain Determined by Small-Punch Test in JN1, JJ1 and JK2 Austenitic Stainless Steels: *Victor Lopez-Hirata*¹; Maribel Saucedo-Muñoz¹; Toshiyuki Hashida²; ¹Instituto Politecnico Nacional (ESIQIE); ²Tohoku University

2:30 PM

Effect of Heat Treatment on the Surface Characteristics of AISI D2 Steel Machined by Wire EDM: *Milind Dhobe*¹; I Chopde²; Chandrashekhar Gogte³; ¹P.E.S. College of Engineering, Aurangabad; ²Visvesvarya National Institute of Technology; ³Marathwada Institute of Technology

2:45 PM

Formability of Multilayered Steel Composites with Improved Strength-Ductility Combination: *Shoichi Nambu*¹; Junya Inoue¹; Toshihiko Koseki¹; ¹The University of Tokyo

3:00 PM

Wear And Nanoindentation Study Of Hardfacing Dual Layer Clad Of Austenitic Stainless Steel And Tungsten Carbide-Cobalt Alloy: *Samar Kalita*¹; ¹Advanced Engineered Materials Center - University of North Dakota

3:15 PM

Hot Deformation Study by Processing Maps of N Containing Microalloyed Steel: *Martina Dikovits*¹; Cecilia Poletti¹; Fernando Warchomicka²; Gajanan P. Chaudhari³; Vivek Pancholi³; ¹IWS, TU Graz; ²IMST, TU Vienna; ³IITR, Roorkee

3:30 PM

Influence of Annealing Treatment on Microstructure and Mechanical Properties of Cold-Rolled Sheet of Fe-36Ni Invar Alloy: *Xiang Jiang*¹; Lijuan Li¹; Xin Xia¹; Junjun Huang¹; Qijie Zhai¹; ¹Shanghai University

3:45 PM

Mechanical Properties of Friction Stir Welded Inconel 600/SS 400 Lap Joints: *Kuk Hyun Song*¹; Won Yong Kim¹; Kazuhiro Nakata²; ¹Korea Institute of Industrial Technology; ²Joining and Welding Research Institute

4:00 PM

Thermodynamic Analysis and Observation on Precipitation of Inclusions in RE-253MA Heat Resistance Steel: *Zhou Cai*¹; ¹Chongqing University of Science and Technology

Energy Nanomaterials: Catalysts and Photocatalysts

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Advanced Characterization, Testing, and Simulation Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Reza Shahbazian-Yassar, Michigan Technological University; Ming Au, Savannah River National Laboratory; Meyya Meyyappan, NASA Ames Research Center

Thursday PM

March 15, 2012

Room: Swan 3

Location: Swan Resort

Session Chairs: Reza Shahbazian Yassar, Michigan Technological University; Masashi Watanabe, Lehigh University

2:00 PM Invited

Computational Studies of Graphene-Supported Metal Nanoparticle Catalysts: *Ashwin Ramasubramaniam*¹; Ioanna Fampiou¹; ¹University of Massachusetts Amherst

2:30 PM

Oxygen Reduction Reaction (ORR) Activity and Electrochemical Stability of Thin-Film Bilayer Systems of Platinum on Niobium Oxide: *David Mülin*¹; Li Zhang¹; Liya Wang²; Chris Holt¹; Titichai Navessin³; Kourosh Malek³; Michael Eikerling²; ¹University of Alberta and NINT NRC; ²Department of Chemistry, Simon Fraser University; ³NRC Institute for Fuel Cell Innovation

2:50 PM

Development of Highly Active Titania-Based Nanoparticles for Composite Propellant Combustion: *David Reid*¹; Kevin Kreitz²; Matthew Stephens²; Jessica King¹; Ponnusamy Nachimuthu³; Eric Petersen²; Sudipta Seal¹; ¹University of Central Florida; ²Texas A&M University; ³Pacific Northwest National Laboratory

3:05 PM Invited

Hierarchical Microporous Materials: Rational and Designable Heterogeneous Catalysts for Renewable Energy: *Wei Fan*¹; ¹University of Massachusetts Amherst

3:35 PM Break

3:55 PM Invited

Characterization of Chemistry of Nanomaterials by (Scanning) Transmission Electron Microscopy: *Masashi Watanabe*¹; ¹Lehigh University

4:25 PM

TiO₂ Nanotube Arrays Grown in Ionic Liquids: High-Performance in Photocatalysis and Energy Storage: Huaqing Li¹; *Jun Qu*²; Surendra Martha²; Qingzhou Cui²; Hanbing Xu²; Huimin Luo²; Miaofang Chi²; Roberta Meisner¹; Nancy Dudney²; Wei Wang²; Sheng Dai²; ¹University of Tennessee; ²Oak Ridge National Laboratory

4:45 PM

Solid State Reactions in TEA Precipitated Cr-ZnO Nanoparticles and Their Use in Photochemical Splitting of Water: *Octavio Dominguez*¹; Luisa Flores¹; Adriana Gaona¹; Guadalupe Sanchez²; Roel Cruz¹; ¹San Luis Potosi University

Energy Technologies and Carbon Dioxide Management: Waste Heat Recovery

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Energy Committee

Program Organizers: Maria Salazar-Villalpando, DOE/National Energy Technology Laboratory; Neale Neelameggham, IND LLC*; Donna Guillen, Idaho National Laboratory; Subodh Das, Phinix, LLC; Ramana Reddy, Univ of Alabama; Animesh Jha, Univ of Leeds; Soobhankar "Sib" Pati, Metal Oxygen Separation Technologies (MOxST); Mark Jolly, Univ of Birmingham; Lakshmanan Vaikuntam, Process Research ORTECH Inc

Thursday PM
March 15, 2012

Room: Europe 8
Location: Dolphin Resort

Session Chairs: Animesh Jha, Univ. of Leeds; Maria D. Salazar-Villalpando, DOE/NETL; Soobhankar Pati, Metal Oxygen Separation Technologies

2:00 PM Introductory Comments

2:05 PM

Effect of Materials on the Autoignition of Cyclopentane: *Donna Guillen*¹; ¹Idaho National Laboratory

2:25 PM

Low Grade Waste Heat Driven Desalination and SO₂ Scrubbing: *Srinivas Garimella*¹; Donald Ziegler¹; James Klausner²; ¹Alcoa; ²University of Florida

2:45 PM

Waste Heat Integration Potential Assessment through Exergy Analysis in an Aluminum Production Facility: *Cassandra Nowicki*¹; Louis Gosselin¹; Carl Duchesne¹; ¹Aluminium Research Centre - REGAL, Laval University

3:00 PM Break

3:05 PM

Study on Drying Characteristics of Australian Brown Coal Using Superheated Steam: *Tsuyoshi Kiriya*¹; Shozo Kaneko¹; Akira Hashimoto¹; Masafumi Maeda¹; ¹The University of Tokyo

3:20 PM

Sustainability, Energy Efficiency and CO₂ Elimination in Concentrate Drying: *Jyri Talja*¹; Shaolong Chen¹; Hannu Mansikkaviita¹; ¹Kumera Corporation

3:35 PM

COURSE50 Development of Heat Recovery System from Steelmaking Slag: *Yasutaka Ta*¹; Hiroyuki Tobo¹; Yuuki Hagio¹; Michihiro Kuwayama¹; ¹JFE Steel Corporation

3:50 PM

Dry Granulation of Molten Blast Furnace Slag and Heat Recovery from Obtained Particles: *Qin Yuelin*¹; Lv Xuewei¹; Bai Chenguang¹; Qiu Guibao¹; ¹College of Materials Science & Engineering, Chongqing University

4:05 PM

The Environment Load Assessment of Iron and Steel Producing BF-BOF and EAF Route Process: *Hongxu Li*¹; Shengli Tao¹; Hao Bai¹; Daqiang Cang¹; ¹University of Science and Technology

4:20 PM

Aluminum Smelter Waste Heat Recovery Plant (Heat Exchangers Fouling and Corrosion-A Detailed Investigation): *Hadi Fanisalek*¹; Mohsen Bashiri¹; Reza Kamali¹; Hormozal

Magnesium Technology 2012: Energy and Biomedical / Primary Production

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Magnesium Committee

Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht; Neale Neelameggham, U.S. Magnesium

Thursday PM
March 15, 2012

Room: Southern V
Location: Dolphin Resort

Session Chairs: Wim Sillekens, TNO; Neale Neelameggham, IND LLC

2:00 PM

In-Vitro Corrosion Studies of Bioabsorbable Magnesium Alloys: *Puneet Gill*¹; Norman Munroe¹; ¹Florida International University

2:20 PM

High-Capacity Hydrogen-Based Green-Energy Storage Solutions for the Grid Balancing: *Fabrizio D'Errico*¹; Adamo Screnzi²; ¹Politecnico di Milano; ²Mc Phy Energy SA

2:40 PM

Reaction Sintering of Mg₂Si Thermoelectric Materials by Microwave Irradiation: *Zhou Cai*¹; Bai Guang²; ¹Chongqing University of Science and Technology; ²Chongqing University

3:00 PM

Charge-Discharge Mechanism of MgC Powders and Mg-Li Alloy Thin Film Materials: *Yen-Ting Chen*¹; Fei-Yi Hung²; Truan-Sheng Lui²; Ren-Syuan Xiao¹; Yi-Wei Tseng¹; Chih-Hsien Wang²; ¹Institute of Nanotechnology and Microsystems Engineering, Center for Micro/Nano Science and Technology, National Cheng Kung University, Tainan, TAIWAN 701.; ²Department of Materials Science and Engineering, National Cheng Kung University, Tainan, TAIWAN 701.



TMS 2012

141st Annual Meeting & Exhibition

THURSDAY PM

3:20 PM Break

3:40 PM

Control of Yttrium Diffusion Out of Yttria Stabilized Zirconia During SOM Electrolysis for Magnesium Production: *Eric Gratz*¹; Soobhankar Pati²; Jarrod Milshtein¹; Adam Powell²; Uday Pal¹; ¹Boston University; ²Metal Oxygen Separation Technologies

4:00 PM

Study on the Thermodynamic and Experimental Carbothermic Reduction of Garnierite: *Tao Qu*¹; Yang Tian¹; Bin Yang¹; Bao-Qiang Xu¹; Da-Chun Liu¹; Yong-Nian Dai¹; ¹National Engineering Laboratory for Vacuum Metallurgy, Kunming University of Science and Technology

4:20 PM

Mechanism of Carbothermic Reduction of Magnesia and Reverse Reaction: *Yang Tian*¹; Tao Qu¹; Bin Yang¹; Hong-Xiang Liu¹; Cheng-Bo Yang¹; Yong-Nian Dai¹; ¹Kunming University of Science and Technology

Magnesium Technology 2012: Processing-Microstructure-Property Relationships II

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht; Neale Neelameggham, U.S. Magnesium

Thursday PM
March 15, 2012

Room: Southern IV
Location: Dolphin Resort

Session Chairs: Alan Luo, GM Global Research and Development; Fabrizio D'Errico, Politecnico di Milano

2:00 PM

Enhancement of Strength and Ductility of Mg₉₆Zn₂Y₂ Rolled Sheet by Controlling Structure and Plastic Deformation: *Masafumi Noda*¹; Yoshihito Kawamura²; Hiroshi Sakurai²; Kunio Funami³; ¹Chiba Institute of Technology; ²Department of Materials Science, Kumamoto University; ³Department of Mechanical Science and Engineering, Chiba Institute of Technology

2:20 PM

Microstructural Characteristics of High Rate Plastic Deformation in Elektron WE43 Magnesium Alloys: *Joseph Hamilton*¹; Sarah Brennan¹; Yongho Sohn¹; Bruce Davis²; Rick DeLorme²; Kyu Cho³; ¹University of Central Florida; ²Magnesium Elektron North America; ³US Army Research Laboratory

2:40 PM

Microstructure and Mechanical Properties of As-Extruded Mg-Sn-Al-Zn Alloys: *Sung Hyuk Park*¹; Young Min Kim¹; Chang Dong Yim¹; Ha-Sik Kim¹; Bong Sun You¹; ¹Korea Institute of Materials Science

3:00 PM

Tensile Properties of Three Preform-Annealed Magnesium Alloy Sheets: *Junying Min*¹; Jon Carter²; Ravi Verma²; ¹Tongji University; ²GM R&D

3:20 PM

The Role of Intermetallics on Creep Behaviour of Extruded Magnesium Alloys: Michelle Fletcher¹; Lukas Bichler¹; *Dimitry Sediako*²; ¹UBC Okanagan; ²NRC - CNRC

3:40 PM Break

4:00 PM

High Performance Mg-System Alloys for Weight Saving Applications: First Year Results from the GREEN METALLURGY EU Project: *Fabrizio D'Errico*¹; Gerardo Garces Plaza²; Markus Hofer³; Shae Kim⁴; ¹Politecnico di Milano; ²Centro Nacional de Investigaciones Metalúrgicas; ³Buhler AG; ⁴Korea Institute of Industrial Technology

4:20 PM

Effect of Extrusion Conditions on Microstructure and Texture of Mg-1% Mn and Mg-1% Mn-1.6% Sr Alloys: *Hemant Borkar*¹; Mihriban Pekguleryuz¹; ¹McGill University

4:40 PM

On the Deformed Microstructure of Rolled Mg-2.9Y: *Amir Farzadfar*¹; Mehdi Sanjari¹; In-Ho Jung¹; Elhachmi Essadiqi²; Stephen Yue¹; ¹McGill University; ²CANMET

Materials and Fuels for the Current and Advanced Nuclear Reactors: Nuclear Fuels and Materials

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS/ASM: Nuclear Materials Committee
Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Thursday PM
March 15, 2012

Room: Swan 4
Location: Swan Resort

Session Chair: Leah Squires, Idaho National Laboratory

2:00 PM

Neptunium Oxide Reduction Technique: *Leah Squires*¹; Paul Lessing¹; James Stuart¹; Bryan Forsmann²; ¹Idaho National Laboratory; ²Boise State University

2:20 PM

Enthalpy of gamma-delta Transition in Ternary U-Pu-Zr Fuel Alloys: *Cynthia Papesch*¹; Thomas O'Holleran¹; Robert Mariani¹; Matthew Cromwell²; ¹Idaho National Laboratory; ²University of Idaho

2:40 PM

Microstructural Analysis of Ion-Implanted PyC/β-SiC: *Rob Coward*¹; Shyam Dwarknath²; Mitra Taheri¹; ¹Drexel University; ²University of Michigan

3:00 PM

Role of Microstructure on Ag and Cs Diffusion in SiC: *Tyler Gerczak*¹; Todd Allen¹; ¹University of Wisconsin-Madison

3:20 PM

Grain Size Dependence of Radiation Response in Silicon Carbide: *Laura Jamison*¹; Peng Xu¹; Kumar Sridharan¹; Todd Allen¹; ¹University of Wisconsin-Madison

3:40 PM Break

3:50 PM

Silver Diffusion in PyC Coated β-SiC: *Shyam Dwarknath*¹; Gary Was¹; ¹University of Michigan

4:10 PM

Mechanism of Proton Irradiation-Induced Creep of Pyrolytic Carbon: *Anne Campbell*¹; Gary Was¹; ¹University of Michigan

4:30 PM

Gas Evolution from Lithium Hydride During X-Irradiation: *Carol Haertling*¹; Joseph Tesmer¹; Yongqiang Wang¹; William McAlexander¹; ¹Los Alamos National Laboratory

4:50 PM

Study of MnO₂/Ag₂O Mixture for an Efficient Trapping of Hydrogen: *Kevin Galliez*¹; Philippe Deniard²; David Lambertin¹; Stephane Jobic²; Florence Bart¹; ¹CEA; ²CNRS

5:10 PM

Novel Methods of Hydrogen Isotope Sequestration using Proton Conducting Ceramic Separation Membranes in Next Generation Nuclear Energy Systems: *Kyle Brinkman*¹; ¹Savannah River National Laboratory (SRNL)

Materials and Fuels for the Current and Advanced Nuclear Reactors: Structural Materials - Irradiation Studies II

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Corrosion and Environmental Effects Committee, TMS/ASM: Nuclear Materials Committee

Program Organizers: Ramprashad Prabhakaran, Idaho National Laboratory; Dennis Keiser, Idaho National Laboratory; Raul Rebak, GE Global Research

Thursday PM
March 15, 2012

Room: Swan 2
Location: Swan Resort

Session Chair: James Cole, Idaho National Laboratory

2:00 PM Invited

Microstructural Characterization of Activated Materials with Neutron Diffraction: *Donald Brown*¹; Thomas Sisneros¹; Paula Mosbrucker¹; Levente Balogh¹; ¹Los Alamos National Lab

2:30 PM

On the Influence of Proton and He Irradiation on Mechanical Properties and Microstructure of Intermetallic Strengthened Steels: *E. Stergar*¹; Christina Hofer²; S. A. Maloy³; P. Hosemann¹; ¹University of California-Berkeley; ²University of Leoben; ³Los Alamos National Laboratory

2:50 PM

Characterization of Ion Irradiation Effects on the Microstructure of 316 Austenitic Stainless Steel: *Alexandre Volgin*¹; Bertrand Radiguet²; Philippe Pareige²; Marie-France Barthe³; Pierre Desgardin³; Brigitte Décamps⁴; Aurélie Gentils⁴; Cédric Pokor⁵; ¹EDF R&D MMC / GPM UMR CNRS 6634 - Université et INSA de Rouen; ²GPM UMR CNRS 6634 - Université et INSA de Rouen; ³CEMHTI CNRS UPR 3079; ⁴CSNSM, CNRS-IN2P3, Université Paris-Sud; ⁵EDF R&D MMC

3:10 PM

Irradiation Induced Phase Change and Microstructures in X-750 CANDU Spacer Materials: *Ken Zhang*¹; Colin Judge²; Zhongwen Yao¹; ¹Queen's University; ²AECL - Chalk River Laboratories

3:30 PM

Pair Distribution Function Analysis of Irradiated Cladding and Duct Reactor Materials: *Avishai Ofan*¹; Simerjeet Gill¹; Stuart Maloy²; Lars Ehm¹; Lynne Ecker¹; ¹BNL; ²LANL

3:50 PM Break

4:00 PM

Toward a Better Understanding of the Hydrogen Impact on the Radiation Induced Growth of Zirconium Alloys: *Lea Tournadre*¹; Fabien Onimus¹; Jean-Luc Bechade¹; Didier Gilbon¹; Jean-Marc Cloue²; Jean-Paul Mardon²; Xavier Feugas³; Ovidiu Toader⁴; ¹CEA; ²AREVA; ³Laboratoire d'Etude des Matériaux en Milieux Agressifs (LEMMA); ⁴Michigan Ion Beam Laboratory (MIBL)

4:20 PM

Influence of Copper Level on Neutron Irradiation Effects in Low Copper Pressurized Water Reactor Vessel Steels: *Hefei Huang*¹; Bertrand Radiguet¹; Patrick Todeschini²; François Clémentot³; Philippe Pareige¹; ¹GPM UMR CNRS 6634 - Université et INSA du Rouen; ²EDF R&D MMC; ³EDF-CEIDRE

4:40 PM

A Synchrotron X-ray Diffraction and Transmission Electron Microscopy Study of Ion-Implantation Induced Microstructure Evolution on the Nuclear-Grade Graphite: *E-Wen Huang*¹; *Chang Chung-Kai*²; Shuo-Cheng Tsai³; Ji-Jung Kai³; ¹Department of Chemical & Materials Engineering and Center for Neutron Beam Applications, National Central University; ²Central University; ³Department of Engineering and System Science, National Tsing-Hua University

5:00 PM

Investigating the Dissolution of Oxide Particles in ODS Steels under Irradiation: *Ceri Williams*¹; Emmanuelle Marquis²; Paul Bagot¹; George Smith¹; ¹University of Oxford; ²University of Michigan

5:20 PM

Effects of Neutron Irradiation on Select MAX Phases: *Darin Tallman*¹; Elizabeth Hoffman²; Dennis Vinson²; Robert Sindelar²; Gordon Kohse³; Michel Barsoum¹; ¹Drexel University; ²Savannah River National Lab; ³Massachusetts Institute of Technology

5:40 PM

TEM Analysis of the Microstructure Evolution in Ion Irradiated Austenitic Stainless Steels: *Alexandre Volgin*¹; Cedric Pokor¹; Brigitte Decamps²; Aurélie Gentils²; Bertrand Radiguet³; Philippe Pareige³; Abderrahim Al-Mazouzi¹; ¹EDF R&D; ²Centre de Spectrométrie Nucléaire et de Spectrométrie de Masse CNRS-IN2P3; ³Groupe de Physique des Matériaux UMR CNRS 6634

Minerals, Metals and Materials under Pressure: New Materials and Properties

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Materials Processing and Manufacturing Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS/ASM: Phase Transformations Committee
Program Organizers: Ellen Cerreta, Los Alamos National Laboratory; Richard Hennig, Cornell University; Dallas Trinkle, University of Illinois, Urbana-Champaign; Vijay Vasudevan, Univ. Cincinnati

Thursday PM
March 15, 2012

Room: Europe 7
Location: Dolphin Resort

Session Chair: Richard Hennig, Cornell University

2:00 PM Invited

Pressure Stabilized Alkali Metal Polyhydrides: *Eva Zurek*¹; ¹University at Buffalo, SUNY



2:30 PM

Polaron Hopping in LiFePO₄ at Elevated Pressures and Temperatures: *Lisa Mauger*¹; Sally Tracy¹; Jorge Munoz¹; Hongjin Tan¹; Hillary Smith¹; Brent Fultz¹; ¹California Institute of Technology

2:50 PM

Effect of Pressure on the Critical Resolved Shear Stress of MgO Single Crystal: Insights from Numerical Modeling: *Philippe Carrez*¹; Jonathan Amodeo¹; Patrick Cordier¹; ¹Lab. UMET CNRS-8207

3:10 PM

High Pressure Study of the Effects of Vacancies on the Lattice Dynamics of B2 FeAl: *Matthew Lucas*¹; ¹Air Force Research Laboratory

3:30 PM

Amorphization and Nanocrystallization in Boron Carbide and Silicon Carbide Impacted at High-Velocity: *Jerry LaSalvia*¹; Eugene Shanholzt¹; ¹U.S. Army Research Laboratory

3:50 PM Break

4:00 PM Invited

Random Search - A Tool for Discovery at High Pressure: *Chris Pickard*¹; ¹University College London

4:30 PM

Equation of State of Solid Solution Mg_{2.4}Fe_{0.6}Al₂Si₃O₁₂ Measured in Diamond Anvil Cell: *Shu Huang*¹; Jihua Chen¹; Bin Yang¹; Vadym Drozd¹; Andriy Durygin¹; ¹Florida International University

4:50 PM

HPHT Synthesis of Phosphorus Doped Diamond from Triphenylphosphine and Graphite: *Bin Yang*¹; Fangli Chi¹; Ernesto Vallejo¹; Jihua Chen¹; ¹Florida International University

5:10 PM

High Pressure X-ray Diffraction Studies for Piezoelectric Materials: *Lingping Kong*¹; Zhenhai Yu²; Luhong Wang²; Haozhe Liu³; Wenge Yang¹; Ho-kwang Mao¹; ¹Carnegie Institution of Washington; ²Argonne National Laboratory; ³Harbin Institute of Technology

Production, Recovery and Recycling of Rare Earth Metals: Session I

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Magnetic Materials Committee, TMS: Recycling and Environmental Technologies Committee
Program Organizers: Lifeng Zhang, Missouri University of Science and Technology; Joseph Pomykala, Alter Trading; Oliver Gutfleisch, IFW Dresden

Thursday PM
March 15, 2012

Room: Europe 4
Location: Dolphin Resort

Session Chairs: Lifeng Zhang, Missouri S&T; Joseph Pomykala, Alter Trading; Oliver Gutfleisch, Institute of Metallic Materials

2:00 PM Introductory Comments

2:05 PM

Recycling of Rare Earth Metals: A Review: *Lifeng Zhang*¹; ¹Missouri University of Science and Technology

2:35 PM

Hydrogen Processing – a Novel Route for the Recycling of Sintered Nd-Fe-B Magnets: *Oliver Gutfleisch*¹; Konrad Güth¹; ¹IFW Dresden

3:05 PM

Electrochemical Behaviour of Neodymium in Aqueous Electrolytes: *Ralph Sueptitz*¹; Kristina Tschulik¹; Margitta Uhlemann¹; Ludwig Schultz¹; Annett Gebert¹; ¹IFW Dresden

3:35 PM

Recovery of Rare Earth Metals via Liquid Metal Extraction: *Ryan Ott*¹; Dan Cavanaugh²; Warren Straszheim²; Matthew Kramer²; Larry Jones²; ¹Ames Laboratory (USDOE); ²Ames Laboratory (USDOE)

4:05 PM Break

4:15 PM

Rapid Separation of Rare Earth Elements with Interstitial Polymer Network Ion Exchange Columns: *Richard Hammen*¹; John Hammen¹; Anupam Goyal¹; ¹IntelliMet LLC

4:45 PM

Selective Extraction of Neodymium from Nd-Fe-B alloys Using Magnesium: *Taek-Soo Kim*¹; Hongjun Chae¹; Ryan Ott¹; ¹Korea Institute of Industrial Technology (KITECH)

5:15 PM

Effect of Tellurium Reduction and Thermoelectric Properties on Thermoelectric Materials Produced by Rapid Solidification Processes and Hot Extrusion.: *Hyo-Seob Kim*¹; *Taek-Soo Kim*²; *Soon-Jik Hong*¹; ¹Kongju National University; ²Korea Institute of Industrial Technology (KITECH)

5:45 PM

Study on the Cerium Oxide Prepared by Pyrolysis of Cerium Chloride Solution: *Bian Xue*¹; Wu Wenyuan¹; ¹Northeastern University

Recent Developments in Biological, Electronic, Functional and Structural Thin Films and Coatings: Process-Properties-Performance Correlations III

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Thin Films and Interfaces Committee

Program Organizers: Nuggehalli Ravindra, New Jersey Institute of Technology; Jian Luo, Clemson University; Xing Yang (Mark) Liu, National Research Council Canada; Nancy Michael, University of Texas at Arlington; Roger Narayan, University of North Carolina and North Carolina State University; Choong-un Kim

Thursday PM
March 15, 2012

Room: Swan 10
Location: Swan Resort

Session Chairs: Nuggehalli Ravindra, New Jersey Institute of Technology; Sudhakar Shet, NREL & NJIT

2:00 PM Introductory Comments

2:05 PM

Morphologies in Polycrystalline Film Growth: *Ramanathan Krishnamurthy*¹; Mikko Haataja²; ¹Purdue University; ²Princeton University

2:35 PM

Nitrogen Doped ZnO (ZnO:N) Thin Films Deposited by Reactive RF Magnetron Sputtering for PEC Application: *Sudhakar Shet*¹; Kwang-Soon Ahn²; Nuggehalli Ravindra²; Yanfa Yan¹; Mowafak Al-Jassim¹; ¹National Renewable Energy Laboratory; ²School of Display and Chemical Engineering; ³New Jersey Institute of Technology

3:05 PM

Hydrothermal Synthesis of Zinc Oxide Thin Film for Printed Electronics: *Ruihong Zhang*¹; Carol Handwerker¹; ¹Purdue University

3:25 PM

Spin-Coated Erbium-Doped Silica Sol-Gel Films on Silicon: *Sufian Abedrabbo*¹; Bashar Lahlouh¹; Sudhakar Shet²; Anthony Fiory³; Nuggehalli Ravindra³; ¹University of Jordan; ²National Renewable Energy Laboratory; ³New Jersey Institute of Technology

3:55 PM Break

4:10 PM

Influence of Annealing on the Martensitic Transformation and Magnetocaloric Effect in $\text{Ni}_{49}\text{Mn}_{39}\text{Sn}_{12}$ Ribbons: *Dianzhen Wu*¹; Sichuang Xue¹; Hongxing Zheng¹; Qijie Zhai¹; ¹Shanghai University

4:30 PM

Metal Diaphragm Based Magnetic Field Sensor: *Asahel Banobre*¹; Ivan Padron¹; Anthony T. Fiory¹; Nuggehalli M. Ravindra¹; ¹NJIT

4:50 PM

Optical and Electronic Properties of III-V Nitrides: *Chiranjivi Lamsal*¹; Nuggehalli Ravindra¹; ¹New Jersey Institute of Technology

5:10 PM

Application of Expanding Thermal Plasma for Deposition of Hydrogenated Diamond like Carbon Thin Films on Rubber Seals: *Ali Reza Eivani*¹; Yutao Pei¹; Jeff Th.M. De Hosson²; Teodor Zaharia¹; Richard M.C.M. Van de Sanden³; ¹Materials Innovation Institute (M2i); ²University of Groningen; ³Eindhoven University of Technology



TMS 2012

141st Annual Meeting & Exhibition

2012 Functional and Structural Nanomaterials: Fabrication, Properties, Applications and Implications: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Nanomaterials Committee

Program Organizers: Jiyoung Kim, University of Texas; David Stollberg, Georgia Tech Research Institute; Seong Jin Koh, University of Texas at Arlington; Nitin Chopra, The University of Alabama; Terry Xu, UNC Charlotte

Monday PM
March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

U-1: A Facile, One Pot and Completely 'Green' Synthesis of Sugar-Reduced Silver Nanoparticles: Lucwaba Yolisa¹; Vulyewa Ncapayi¹; Odey Akpa¹; Sandile Songca¹; *Oluwafemi Oluwatobi*¹; ¹Walter Sisulu University

U-2: Analysis of RTS Noise Characteristics in Fin-Type Silicon-Oxide-High-k-Oxide-Silicon (SOHOS) Flash Memory: *Seung Dong Yang*¹; Sang Youl Lee²; Ho Jin Yun²; Kwang Seok Jeong²; Yu Mi Kim²; Jae Sub Oh³; Hi-Deok Lee²; Ga Won Lee²; ¹Chungnam University; ²Chungnam university; ³National Nanofab Center

U-3: Atmospheric-Pressure Plasma Sintering of Silver Nanopaste Screen-Printed on PI: *Kwang-Seok Kim*¹; Woo-Ram Myung¹; Seung-Boo Jung¹; ¹Sungkyunkwan University

U-4: Effects of Calcination Conditions on Particle Size and Morphology of NiFe₂O₄ Nanoparticles Synthesized by Solid-State Reaction: *Zhigang Zhang*¹; Yihan Liu¹; Guangchun Yao¹; Di Wu¹; Junfei Ma¹; ¹Northeastern University

U-5: Electrical Characterization in Pillar Type Silicon-Oxide-Nitride-Oxide-Silicon Flash Memory Using Bandgap Engineering Method: *Sang Youl Lee*¹; Seung Dong Yang¹; Jae Sub Oh²; Ho Jin Yun¹; Kwang Seok Jeong¹; Yu Mi Kim¹; Hi Deok Lee¹; Ga Won Lee¹; ¹ChungNam University; ²National Nanofab Center

U-6: Electrical Characterization of TiO₂ Thin Films Prepared by Atomic Layer Deposition: *Antonio Lucero*¹; Mingun Lee¹; Jiyoung Kim¹; ¹University of Texas at Dallas

U-7: Electrospinning of the Dendritic Polymer (Acrylonitrile /Acrylic Acid) and the Properties of Fibers: *Elahe Helmi*¹; ¹Engineering Faculty

U-8: Fabrication of Bulk Al-Fe-V-Si Nanocrystalline Alloy by Mechanical Alloying and Hot Pressing: *M.H. Enayati*¹; H. Ashrafi¹; R. Emadi¹; ¹Isfahan University of Technology

U-9: Implementation of Parylene as a Low- ϵ Gate Dielectric Material for Graphene Field Effect Transistors (GFETs): *Greg Mordi*¹; Srikar Jandhyala¹; Jiyoung Kim¹; ¹University of Texas at Dallas

U-10: Mechanical Properties of WC-10wt.%Co Hard Materials Prepared by SPS Process for FSW Tool Application: Hyun-Kuk Park¹; *Hee-Jun Youn*¹; Ik-Hyun Oh¹; ¹KITECH / Automotive Components Center

U-11: Nanotechnology Coating of Buildings with Sol-Gel Method: *Aref Sadeghi Nik*¹; Ali Bahari²; MohammadH. Khalilpasha³; Adel Sadeghi Nik¹; ¹Young Researchers Club, Jouybar Branch, Islamic Azad University, Jouybar, Iran; ²Department of Physics, University of Mazandaran, Babolsar, Iran; ³Dept. of Civil Engineering, Islamic Azad University, Jouybar branch, Jouybar, Iran

U-12: PHB Nanocomposite Microcapsules with Brazilian Smectitic Clays: Francisco Valenzuela-Diaz¹; *Maria da Silva-Valenzuela*¹; Wang Shu Hui¹; Helio Wiebeck¹; ¹Universidade de Sao Paulo

U-13: Raman Spectroscopy of Graphene and Plasma Treated Graphene under High Pressure: *Ali Hadjikhani*¹; Jiuhua Chen¹; Santanu Das¹; Won-bong Choi¹; ¹FIU

U-14: Research on Preparation of Anisotropic Sm₂Co₁₇ Nanoflakes by Ball Milling under Magnetic Field: *Ying Chang*¹; Jian Zhao¹; Xiaodong Li; Zhiyong Wei¹; Minggang Zhu²; Zhaohui Guo²; Wei Li²; ¹Dalian University of Technology; ²China Iron & Steel Research Institute Group

U-15: Room-Temperature Synthesis of Spherical and Flowerlike Ag Nanostructures in Different Solvent: *Guoliang Li*¹; Bing Peng²; Liyuan Chai²; Lei Jiang²; Liyuan Zhang²; ¹Central South University; ²Central South University

U-16: Scaling Down High-k Gate Dielectrics for Graphene-Based Device Applications: *Srikar Jandhyala*¹; Greg Mordi¹; Jiyoung Kim¹; ¹University of Texas at Dallas

U-17: Selective Area Atomic Layer Deposition (ALD) with E-Beam Lithography (EBL) on Self-Assembled Monolayers (SAM): *Jie Huang*¹; Mingun Lee¹; Jiyoung Kim¹; ¹University of Texas at Dallas

U-18: Sensitive Colorimetric Detection of Cysteine in the Presence of Glutathione Using Gold Nanoparticles Aggregation: *Ensieh Seyedhosseini*¹; M.Reza Hormozi-Nezhad²; ¹Chemistry Department, Sharif University of Technology; ²Institute for Nanoscience and Nanotechnology(INST), Sharif University of Technology

U-19: Study on Liquid Sodium with Suspended Nanoparticles

-(1) Fabrication and Dispersion of Nanoparticles: *Koichi Fukunaga*¹; Masahiko Nagai²; Kuniaki Ara³; Jun-ichi Saito³; ¹Mitsubishi Heavy Industries, Ltd.; ²Mitsubishi Heavy Industries, Ltd.; ³Japan Atomic Energy Agency

U-20: Study on Liquid Sodium with Suspended Nanoparticles-(2) Atomic Interaction and Characteristics of Liquid Sodium with Suspended Nanoparticles- *Jun-ichi Saito*¹; Keiichi Nagai¹; Kuniaki Ara¹; ¹Japan Atomic Energy Agency

U-21: Study on Microstructure Control and Atmospheric Corrosion of Micro-alloying Heavy Rail Steel: *Wang Xiao Li*¹; ¹University of Science and Technology Beijing

U-23: The Post-Annealing Effects of N-Doped ZnO Films Deposited by the Atomic Layer Deposition: *Kwang Seok Jeong*¹; Yu Mi Kim¹; Ho Jin Yun¹; Seung Dong Yang¹; Sang Youl Lee¹; Young Su Kim²; Hi Deok Lee¹; Ga Won Lee¹; ¹Chungnam National University; ²Nanofab Center

U-24: Thermo-mechanical properties investigation of PMMA nanocomposites using functionalized zirconia nanoparticles: *Muhammad Sajjad*¹; ¹Vienna University of Technology

Alumina and Bauxite: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Committee, TMS: Aluminum Processing Committee
Program Organizer: Benny Raahauge, FLSmidth

Monday PM
March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

M-1: Acid Cleaning of Titanium Based Scales Formed on Preheaters in the Bayer Process: *Ibrahim Akpınar*¹; Yasemin Guldogan²; Oktay Uysal²; Gökhan Demir³; Meral Baygul³; Yücel Sahin⁴; ¹Entekno industrial, technological and nano materials ltd.; ²Entekno Industrial, Technological and Nano Materials Ltd.; ³Eti Alüminyum A.S.; ⁴Anadolu University

M-2: Extracting Alumina from Coal Fly Ash with Ammonium Sulfate Sintering Process: *Laishi Li*¹; Xinqin Liao¹; Yusheng Wu²; Yingying Liu¹; ¹Shenyang Aluminum & Magnesium Engineering & Research Institute Co., Ltd.; ²School of Materials Science and Engineering, Shenyang University of Technology

M-3: Study on Absorption of Low-Concentration SO₂ with Basic Slag Intensified by Ultrasonic Wave: *Nan Xiangli*¹; Zhang Ting'an¹; Zhang Lu¹; Liu Yan¹; Lv Guozhi¹; Zhao Qiuyue¹; ¹Northeastern University

Aluminum Alloys: Fabrication, Characterization and Applications: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Aluminum Processing Committee
Program Organizers: Subodh Das, Phinix LLC; Tongguang Zhai, University of Kentucky; Zhengdong Long, Kaiser Aluminum

Monday PM
March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

L-1: A Study of Microstructural Stability of Friction Stir Welded Joints of Al-Mg Alloys during Subsequent Thermal Exposure: *Chun-Yi Lin*¹; Truan-Sheng Lui¹; Li-Hui Chen¹; ¹National Cheng Kung University

L-2: Characterization of the Compressive Behaviour of an Al Foam by X-Ray Computerized Tomography: *Girolamo Costanza*¹; F. Mantineo²; Severino Missori¹; Maria Elisa Tata¹; Andrea Sili²; ¹University of Rome "Tor Vergata"; ²Università di Messina

L-3: Computer Aided Cooling Curve Thermal Analysis of Al-Si-Cu-Mg Alloys: First and Second Derivative Curves: *Saeed Farahany*¹; Ali Ourdjini¹; Mohd Hasbullah Idris¹; ¹Universiti Teknologi Malaysia

L-4: Effect of Co on the Microstructure of Al-20Si-5Fe Alloys: O. Uzun¹; M.F. Kilicaslan²; F. Yilmaz²; *Soon-Jik Hong*⁴; ¹Gaziosmanpaşa University; ²Kastamonu University; ³Gaziosmanpaşa University; ⁴Kongju National University

L-5: Effect of Pin Tool Pass on the Quality of Friction Stir Weldment: An Experimental Evaluation: *Abdelrahman Shuaib*¹; Fadi Al Bedour¹; Nesar Merah¹; Abdulaziz Bazoune¹; ¹King Fahd University of Petroleum & Minerals

L-6: Energy Absorption of Aluminum Foam-Filled Tubes under Quasi-Static Axial Loading: *Huan Liu*¹; Guangchun Yao²; Zhuokun Cao²; ¹Northeastern University; ²Northeastern University

L-7: Fabrication and Characterization Al-SiC Composite Foam: *Geo Harrison*¹; Ganapathy Subramanian²; Vinoth Kambli²; Pradeep Kumar²; ¹COLLEGE OF ENGINEERING GUINDY, ANNA UNIVERSITY; ²College of Engineering Guindy, Anna University

L-8: Friction Stir Welding of Aluminum Alloys: *Jaehyung Cho*¹; Chang Gil Lee¹; ¹Korea Institute of Materials Science

L-9: Mechanical and Microstructural Characterization of a 2618 Aluminum Alloy under Compression Tests: *Adriana Salas Zamarripa*¹; Edgar Frago¹; Ana Macias¹; Martha Guerrero Mata¹; ¹Universidad Autonoma de Nuevo Leon

L-10: Optimization of Process Parameters of Preparing Foamed Al-Si Alloy Based on Ga-Based Bp Neural Network: *Jingbo Xu*¹; Huimin Lu¹; Qiang Li¹; ¹Beihang University

Biological Materials Science Symposium: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Nima Rahbar, University of Massachusetts Dartmouth; Candan Tamerler, University of Washington; Po-Yu Chen, University of California, San Diego; Molly Gentleman, Texas A&M University

Monday PM
March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

G-1: Aging Heat Treatment and Phase Transformations in Ti-Nb-Sn Alloys: Eder Lopes¹; Alessandra Cremasco¹; Rodrigo Contieri¹; *Rubens Caram*¹; ¹University of Campinas

G-2: Corrosion Behavior under Biological Environment of Zr₆₁Ti₂Cu₂₅Al₁₂ Amorphous Alloy: *Ling Shi*¹; Xu Zhao¹; Qiang He¹; Jian Xu¹; ¹Institute of Metal Research, Chinese Academy of Sciences

G-3: Effect of Heat Treatment on Oxidation Behavior and Brightness of Oxide Film Formed on Ti-Nb-Ta-Zr Alloy: *Eri Miura-Fujiwara*¹; Soichiro Yamada²; Yoshimi Watanabe²; Toshihiro Kasuga²; Mitsuo Niinomi³; Tohru Yamasaki¹; ¹University of Hyogo; ²Nagoya Institute of Technology; ³Tohoku University

G-4: Effects of Nitrogen Addition on Mechanical Properties of Hot-Forged Biomedical Co-Cr-Mo Alloys with Ultrafine-Grained Microstructures: *Kenta Yamanaka*¹; Manami Mori²; Akihiko Chiba¹; ¹Tohoku University; ²NISSAN ARC, LTD.

G-5: Evaluation of Properties of TiO₂ Ceramic Dental Block Fabricated by Magnetic Pulsed Compaction (MPC): Hyo-Young Park¹; Jin-Sung Choi¹; Hyo-Seob Kim¹; Uk-Hyon Joo²; Jar-Myung Koo¹; *Soon-Jik Hong*¹; ¹Kongju National University; ²BioMaterials Korea Inc

G-6: In Vito Osteogenic Capability of Rat-Derived Mesenchymal Cells Cultured on Biomimetic Hydroxyapatite: *Mina Khorami*¹; Saeed Hesarak¹; Sajad Farhangdoust¹; Ali Zamanian¹; Hamid Nazarian¹; ¹materials and energy research center

G-7: Mechanical Behavior and Corrosion Resistance of Nanostructured Ti_{67.75}Fe_{28.36}Sn_{3.85} and Ti₅₃Nb₃₅Zr₇Ta₅ Alloys for Biomedical Applications: *Anna Hynowska*¹; Jordina Fornell¹; Eva Pellicer¹; Sergio González¹; Nele Van Steenberghe¹; Santiago Suriñach¹; Maria Dolors Baró¹; Jürgen Eckert¹; Jordi Sort¹; ¹Universitat Autònoma de Barcelona



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G-8: Nature's Inspiration: How Do Quills Protect Porcupines?:

*Wen Yang*¹; Ekaterina Novitskaya¹; Sara Bodde¹; Zherrina Manilay²; Christy Chao³; Joanna Mckittrick¹; ¹Materials Science and Engineering Program, University of California, San Diego; ²Department of Mechanical and Aerospace Engineering, University of California, San Diego; ³Brown University

G-9: Nitinol Commercialization Accelerator – Ohio Third Frontier:

*Janet Gbur*¹; JR Lewandowski¹; H Lavvafi¹; M Young²; D Schwam¹; JD McGuffin-Cawley¹; MV Nathal³; S Padula³; JJ Lewandowski¹; ¹Case Western Reserve University; ²Cleveland Clinic; ³NASA Glenn Research Center

G-10: Parametric Study of Fibroblast Attachment Kinetics on Fibronectin-Coated Polystyrene Tissue Culture Plates: *Shawn Regis*¹;

Sina Youssefian¹; Nima Rahbar¹; Sankha Bhowmick¹; ¹UMass Dartmouth

G-11: Peptide-Enabled Control of Metal Nanoparticle Biomineralization: *Marketa Hnilova*¹;

Dmitriy Khatayevitch¹; Hanson Fong¹; Candan Tamerler¹; Mehmet Sarikaya¹; ¹University of Washington

G-12: Processing and In Vivo Evaluation of Spark Plasma Sintered Al₂O₃-YSZ-TiO₂ Composites: *Ipek Akin*¹;

Viorica Simon²; Simona Cavalu³; *Gultekin Goller*¹; ¹Istanbul Technical University; ²Babes-Bolyai University; ³University of Oradea

G-13: Strong Fiber Reinforced Hydrogel Composite: *Animesh Agrawal*¹;

Sina Youssefian¹; Nima Rahbar¹; Paul Calvert¹; ¹University of Massachusetts Dartmouth

G-14: Strontium Releasing And Physicochemical Properties of Novel Calcium Sulfate Bone Substitute Materials: *Saeed Hesaraki*¹;

*Sajad Farhangdoust*²; Hadis Bandegani²; Mina Khorami²; Ali Zamanian²; ¹materials and energy research center; ²Materials and Energy Research Center

G-15: Sulfate- Reducing Bacteria Biofilm Corrosion Behavior of High Strength Steel (API-5L X80) Weldment: *Faisal Al-Abbas*¹;

Tony Kakpovbia¹; David Olson²; Brajendra Mishra²; John Spear²; ¹Saudi Aramco; ²Colorado school of Mines

G-16: Weibull Analysis of the Behavior on Tensile Strength of Bamboo Fiber of the Specimen *Dendrocalmus Giganteu*: *Lucas Martins*¹;

Nathalia Rosa¹; Sergio Monteiro¹; ¹UENF

G-17: Wet Chemical Synthesis of Hydroxyapatite from Egg Shells: *Muhammad Aftab Akram*¹;

Rafaqat Hussain²; Mohammad Islam¹; ¹National University of Sciences and Technology Pakistan; ²University Teknologi Malaysia, 81310 UTM Skudai, Johor Darul Ta'zim, Malaysia.

Computational Thermodynamics and Kinetics: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, 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, TMS/ASM: Computational Materials Science and Engineering Committee, TMS: Integrated Computational Materials Engineering Committee, TMS/ASM: Phase Transformations Committee, TMS: Process Technology and Modeling Committee

Program Organizers: Zi-Kui Liu, The Pennsylvania State University; Mark Asta, University of California, Berkeley; James Warren, The National Institute of Standards and Technology; Yunzhi Wang, Ohio State University; Raymundo Arroyave, Texas A & M University; Yu Wang, Michigan Tech

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March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

C-1: A Kinetic Study of the Leaching of Germanium Dust and Fume by Sulfuric Acid: *Wankun Wang*¹; Jinhui Peng¹; Zebiao Zhang¹; Lijuan Chu¹; Guodong Lai¹; ¹Kunming University of Science and Technology

C-2: Continuous Modeling of Microstructure Evolution Coupled with Plastic Activity: *Maeva Cottura*¹; Yann Le Bouar¹; Alphonse Finel¹; Benoît Appolaire¹; Samuel Forest²; ¹Laboratoire d'Etude des Microstructures, CNRS/ONERA; ²Mines ParisTech, Centre des Matériaux CNRS UMR 7633

C-3: Convex Projection to Estimate Heat Content of Cold Charges in Peirce-Smith Converting: *Alessandro Navarra*¹; Anna-Maria Pabill Melsio²; Joël Kapusta³; ¹Universidad Católica del Norte; ²Air Liquide; ³BBA Inc.

C-4: Effects of Sub-Surface He Bubbles on Tungsten Surface Evolution: *Faiza Sefta*¹; Karl Hammond²; Niklas Juslin²; Brian Wirth²; ¹UC Berkeley; ²University of Tennessee

C-5: Establishment and Analysis of the Composite Key Stratum Model Layer on the Winkler Foundation: *HongYu Pan*¹; Shu-Gang Li¹; Peng-Xiang Zhao¹; ¹Xi'an University of Science and Technology

C-6: First-Principles-Based Phase Diagram for (Mo_xNb_(1-x))Si₂ Pseudobinary Alloys: *Koretaka Yuge*¹; Yuichiro Koizumi²; Koji Hagihara³; Takayoshi Nakano⁴; Kyosuke Kishida¹; Haruyuki Inui¹; ¹Department of Materials Science and Engineering, Kyoto Univ.; 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

C-7: Gaseous Nitriding Process Control: Application of Customized Lehrer Diagrams: *Mei Yang*¹; Richard Sisson¹; ¹WPI

C-8: Intelligent Heat Treating: Simulation of Carburization Process: *Lei Zhang*¹; Yingying Wei¹; Liang He¹; Richard D Sisson¹; ¹WPI

C-9: Molecular Dynamics Simulation Study of the Alloying Reactions of Nanostructured Al/Ni Clad Particles System under Thermal Loading: *Shijin Zhao*¹; ¹Shanghai University

C-10: Numerical Simulation of Directionally Solidified Structure of Ti-47Al-2Cr-2Nb Alloy Based on CA Method: Jixiang Xu¹; Qingyan Xu¹; Jin Cheng¹; Hu Zhang²; Baicheng Liu¹; ¹Tsinghua University; ²Beihang University

C-11: Phase Diagram Determination for Several Fe-Based and Ni-Based Ternary Systems: *Siwei Cao*¹; Ji-Cheng Zhao¹; ¹The Ohio State University

C-12: Reactivity of the Faying Surface in Al-Mg₂Si Metal Matrix Composite/Magnesium Alloy Bonds: *Mehdi Mazar Atabaki*¹; Andrew Mullis¹; ¹University of Leeds

C-13: Study on Blowing Nitrogen Alloying of Stainless Steel AISI410 with LF Refining: *Zhou Cai*¹; ¹Chongqing University of Science and Technology

C-14: Understanding H Induced Failure Mechanisms in Metallic Alloys: The Role of Attractive H-H Interactions in Nano-Precipitate Formation: *Johann von Pezold*¹; Alexander Udyansky¹; Ugur Aydin¹; Tilmann Hicel¹; Joerg Neugebauer¹; ¹Max-Planck-Institut für Eisenforschung GmbH

Deformation, Damage, and Fracture of Light Metals and Alloys: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Metals Division, TMS Light Metals Division, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Qizhen Li, University of Nevada, Reno; Fugian Yang, Univ. of Kentucky; Ke An, Oak Ridge National Laboratory

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March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

N-1: Correlation between Melt Quality and Fatigue Properties of 2024, 6063 and 7075: *Engin Tan*¹; Ali Tarakcilar¹; Derya Dispinar²; ¹Pamukkale University; ²University of Istanbul

Magnesium Technology 2012: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division, TMS: Magnesium Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Wim Sillekens, TNO; Norbert Hort, Helmholtz-Zentrum Geesthacht; Neale Neelameggham, U.S. Magnesium

Monday PM
March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

K-1: Characteristics of β' Phase in an Aged Mg-10Gd-3Y-0.5Zr Alloy: *Dejiang Li*¹; ¹Shanghai Jiao Tong University

K-2: Coherency Strain and Interfacial Energy of Mg₃-Rare Earth D019 Precipitates from First-Principles: *Ahmed Issa*¹; James Saal¹; Chris Wolverton¹; ¹Northwestern University

K-3: Combination of Cooling Curve and Micro-Chemical Phase Analysis of Rapidly Quenched Magnesium AM60 Alloy: *Paul Marchwica*¹; Jerry Sokolowski¹; Adam Gesing²; John Jekl³; Carsten Blawert⁴; Richard Berkmortel³; ¹University of Windsor; ²Gesing Consultants Inc.; ³Meridian Technologies Inc.; ⁴GKSS Forschungszentrum Geesthacht GmbH

K-4: Corrosion Behavior of Pure Mg Extrudate: *Chang Dong Yim*¹; Young Min Kim¹; Sung Hyuk Park¹; Ha-Sik Kim¹; Byoung-Gi Moon¹; Bong Sun You¹; ¹Korea Institute of Materials Science

K-5: Critical Grain Size for Change in Tensile Deformation Behavior and Transition in Tension-Compression Asymmetry in a Magnesium Alloy: *S. K. Panigrahi*¹; K. Kandasamy¹; N. Kumar¹; R. S. Mishra¹; R. DeLorme¹; B Davis¹; R.A. Howell¹; K Cho¹; ¹Centre for Friction Stir Welding and Material science and Engineering

K-6: Doping Effect on the Formation Energy of the Basal-Plane Stacking Faults in Binary Mg-X Alloys: First-Principles Calculations: *William Yi Wang*¹; Shun Li Shang¹; Zhi Gang Mei¹; Yi Wang¹; Suveen Nigel Mathaudhu²; Xi Dong Hui³; Zi-Kui Liu¹; ¹Pennsylvania State University; ²US Army Research Office; ³University of Science and Technology Beijing

K-7: Ductility Improvement in Equal Channel Angular Processed AZ31 Magnesium Alloy: *Sonia Modarres-Razavi*¹; David Foley¹; Ibrahim Karaman¹; Karl T. Hartwig¹; Laszlo Kecskes²; Suveen Mathaudhu²; Vincent Hammond²; ¹Texas A&M University; ²U.S. Army Research Laboratory

K-8: Effect of CaO on Creep Behavior of Magnesium Alloys: *Hyun Kyu Lim*¹; Shae K. Kim¹; ¹KITECH

K-9: Effect of Gadolinium and Yttrium Content on Microstructure and Strength of Mg-Li Alloys: *Min Li*¹; Guangchun Yao¹; Guoyin Zu¹; Mengxiao Chen¹; Jun Cheng¹; Qingyan Zhu¹; ¹Northeastern University

K-10: Effect of Grain Refinement and Texture Changes Induced by Burnishing on Corrosion Resistance of Magnesium Alloy for Biomedical Applications: *Z. Pu*¹; *S. Yang*¹; G.-L. Song²; O.W. Dillon, Jr.¹; D. A. Puleo¹; I.S. Jawahir¹; ¹University of Kentucky; ²General Motors

K-11: Effect of Heat Input on Microstructure and Mechanical Properties of Pulsed TIG Welded AZ31 Magnesium Alloys: *Alireza Amirkhani*¹; Alireza Ebrahimi¹; Rasool Azari Khosroshahi¹; ¹Sahand University of Technology

K-12: Effect of Zn Concentration on the Microstructures and Mechanical Properties of Extruded Mg-Y-Gd-Zr Alloys: *Jian Meng*¹; Ke Liu¹; Xin Qiu¹; Deping Zhang¹; Yangde Li²; ¹Changchun Institute of Applied Chemistry, Chinese Academy of Sciences; ²Dongguan e-ande Co. Ltd

K-13: Effects of Friction Stir Process on the Tensile Properties of AZ61 Magnesium Alloy at Room Temperature to 200°C: *Hsiang-Ching Chen*¹; Truan-Sheng Lui¹; Li-Hui Chen¹; Fei-Yi Hung¹; ¹National Cheng Kung University

K-14: Enhanced Corrosion Resistance of AE42 Magnesium Alloy Achieved by SPD: *Peter Minárik*¹; Robert Král¹; Miloš Janeček¹; ¹Charles University in Prague

K-15: Eutectic Formation in Binary Alloys: *Morteza Amoorezaei*¹; Rameez Ashraf¹; David Montiel¹; Nikolas Provatias¹; ¹McMaster University

K-16: Finite Element Analysis of the Evolution of Damage during Equal Channel Angular Pressing of a Mg-3Al-1Zn Alloy: *Feng Kang*¹; Jing Tao Wang²; Chao Hong Zhang¹; Ping Cheng¹; Hai Ying Wu¹; ¹Jinxi Axle Co., LTD; ²Nanjing University of Science and Technology

K-17: High Strength Magnesium Alloys as Light Weight Advanced Structural Materials for Automotive and Aerospace Applications: *Ankit Gupta*¹; ¹Assistant Manager, Materials Department, Tata Motors Limited, Pantnagar Works, INDIA

K-18: Hot and Cold Deformation of Twin Roll Cast AZ31 Magnesium Alloy: Modeling and Experiments: *Hesamaldin Askari*¹; John Young¹; Hussein Zbib¹; David Field¹; Ghassan Kridli²; Mohammed Khaleel³; ¹Washington State University; ²Texas A&M University at Qatar; ³Pacific Northwest National Laboratory

K-19: Improved Sintering of Mg Powder Metallurgy Compacts by Thermal Pretreatment: *Paul Burke*¹; Florian Saint-Lebes²; Georges Kipouros³; ¹Massachusetts Institute of Technology; ²ICAM; ³Dalhousie University



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K-20: Influence of Section Thickness on Microstructure and Mechanical Properties of Squeeze Cast Magnesium Alloy AM60: *Xuezhi Zhang*¹; Meng Wang¹; Zhizhong Sun¹; Henry Hu¹; ¹University of Windsor

K-21: Influence of Zinc-Yttrium Ratio and Cerium on the Mechanical Properties of Hot Rolled and Friction Stir Processed Mg-Zn-Y Alloys: *Arun Mohan*¹; Rajiv Mishra¹; Ravi Verma¹; ¹Missouri University of Science and Technology

K-22: Insights into the Nucleation of Extension Twins in Mg Alloys: *Ali Khosravani*¹; Raja Mishra²; Brent Adams¹; David Fullwood¹; ¹Brigham Young University; ²General Motors

K-23: In Situ Quantitative Tension and Compression Study on Twinning and Detwinning in Submicron-Sized Mg Crystals inside a Transmission Electron Microscopy: *Boyu Liu*¹; Zhiwei Shan¹; Xiyan Zhang²; Jun Sun¹; Evan Ma³; ¹Xi'an Jiaotong University; ²Chongqing University; ³The Johns Hopkins University

K-24: Investigation of Mechanical Properties of AZ31 Mg Alloys Coated by Plasma Electrolytic Oxidation: *Ahmet Ucisik*¹; Salih Durdu¹; ¹Bogazici University

K-25: 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 Yao¹; Guoyin Zu¹; Jun Cheng¹; Qingyun Liu¹; Liping Zhou¹; ¹Northeastern University

K-26: Magnesium Recycling of Partially Oxidized, Mixed Magnesium-Aluminum Scrap through Combined Electrorefining and Solid Oxide Membrane (SOM) Electrolysis Processes: *Xiaofei Guan*¹; Peter Zink¹; Uday Pal¹; ¹Boston University

K-27: Measuring Heat Transfer during Twin Roll Casting of Metals: *Pedram Mehraram*¹; Mary Wells¹; ¹University of Waterloo

K-28: Mg-Rich Region of the Mg-Gd-Al and Mg-Gd-Sn Ternary Phase Diagrams: *John Kuper*¹; J.-C. Zhao¹; ¹The Ohio State University

K-29: Microstructure and Mechanical Properties of Mg-5Sn-5Zn-xCa Alloys: *Liu Bin*¹; ¹Shenyang University of Technology

K-30: Microstructure and Mechanical Properties of Nanocrystalline Pure Mg via Cryomilling, Spark Plasma Sintering and Extrusion: *Baolong Zheng*¹; Troy Topping¹; Yuhong Xiong¹; Yizhang Zhou¹; Suveen Mathaudhu²; Enrique Lavernia¹; ¹University of California, Davis; ²U.S. Army Research Office

K-31: Microstructures and Mechanical Properties of Rapidly Solidified Mg-RE Base Alloy Powder Produced by Using LME Method: *Hong Jun Chae*¹; Sun Woo Nam¹; Tae Bum Kim¹; Taek-Soo Kim¹; ¹Korea Institute of Industrial Technology

K-32: Microstructure and Texture Effects on the Deformation Behaviors of the Statically Recrystallized Mg-Zn-MM Alloy Sheets: *Heon Kang*¹; SeEun Shin¹; DongHyun Bae¹; ¹Yonsei University

K-33: Modeling of Deformation Behavior of Multiphase Wrought Magnesium: *Dongsheng Li*¹; Curt Lavender¹; Eric Lavender¹; Xin Sun¹; Mohammed Khaleel¹; ¹Pacific Northwest National Laboratory

K-34: Nanostructure Formation in a Quenched Mg Alloy: *Wanqiang Xu*¹; Michael Ferry¹; ¹University of New South Wales

K-35: One-Step Approach to Enhance Corrosion Resistance of Coating Layer on AZ91 Mg Alloy via Plasma Electrolytic Oxidation in Electrolyte Containing Ammonium Vanadate: You Chan Jung¹; Kang Min Lee¹; Sang Il Yoon¹; Young Gun Ko²; Dong Hyuk Shin¹; ¹Hanyang University; ²Yeungnam University

K-36: Phase Dissolution of γ -Mg17Al12 during Homogenization of As-Cast AZ80 Magnesium Alloy and Its Effect on Room Temperature Mechanical Properties: *Rahul Kulkarni*¹; Nityanand Prabhu¹; Peter Hodgson²; Bhagwati Kashyap¹; ¹Indian Institute of Technology Bombay; ²Deakin University, Australia

K-37: Precipitation Formation and Grain Refinement of Mg-Al-Sn Alloy during Hot Deformation: *Abu Syed Humaun Kabir*¹; Jing Su¹; Phuong Vo¹; In-Ho Jung¹; Stephen Yue¹; ¹McGill University

K-38: Production of Mg-Ni Alloy by Consumable Cathode Molten Salt Electrolysis: *Bian Xue*¹; Wu Wenyuan¹; ¹Northeastern University

K-39: Quasi-Static and Dynamic Compressive Mechanical Behavior of Coarse Grained and Ultrafine Grained Mg-Y-RE Alloy: *Nilesh Kumar*¹; S. Panigrahi¹; R. Mishra¹; R. DeLorme²; B. Davis²; R. Howell³; K. Cho³; ¹Missouri University of Science & Technology; ²Magnesium Elektron North America Inc.; ³Weapons and Materials Research Directorate

K-40: Secondary Ion Mass Spectrometry for Mg Tracer Diffusion: Issues and Solutions: *Jay Tuggle*¹; Jerry Hunter¹; Nagraj Kulkarni²; Yongho Sohn³; ¹VT; ²Oak Ridge National Laboratory; ³University of Central Florida

K-41: Semisolid Joining of Magnesium AZ91 Alloy by Partial Remelting and Mechanical Stirring: *Hossein Aashuri*¹; Vahid Hosseini¹; ¹Sharif University

K-42: Severe Plastic Deformation of Magnesium Alloys by Machining: *Saurabh Basu*¹; M. Ravi Shankar¹; ¹University of Pittsburgh

K-43: Slip and Twin Behavior of Magnesium Single Crystals: *Ming Zhe Bian*¹; Kwang Seon Shin¹; ¹Magnesium Technology Innovation Center, Seoul National University

K-44: Stress Corrosion Cracking Susceptibility of Ultrafine Grained AZ31: *Gaurav Argade*¹; Wei Yuan¹; Kumar Kandasamy¹; Rajiv Mishra¹; ¹Missouri University of Science and Technology

K-45: The Effect of Precipitation on the Mechanical Properties of Extruded AZ80: *Ran Liu*¹; Jing Wang¹; De Yin¹; ¹Nanjing University of Sci & Tech

K-46: The Investigation of Twin Interface Structure in AZ31 Magnesium Alloys: *Daisuke Ando*¹; Yuji Sutou¹; Junichi Koike¹; ¹Tohoku University

Materials Processing Fundamentals: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Process Technology and Modeling Committee
Program Organizers: Lifeng Zhang, Missouri University of Science and Technology; Antoine Allanore, MIT; Cong Wang, Saint-Gobain High Performance Materials

Monday PM
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Room: Atlantic Hall
Location: Dolphin Resort

Q-1: A Physical Model for Growth of Graphene Layers from Metallic Melts: *Shaahin Amini*¹; Haamun Kalaantari²; Reza Abbaschian²; ¹University of California Riverside; ²University of California Riverside

Q-2: A Way to Control Distortion of Metal Parts during Heat Treatment Process: Yuan Lu¹; *Jin-wu Kang*¹; ¹Tsinghua Univ

Q-3: Analysis of Open Forging of Cylindrical Blanks between Two Flat Die Surfaces: *Ahmed Elkholi*¹; Dhari Almutairi¹; ¹Kuwait University

Q-4: Effects of Tempering on the Microstructure and Hardness of a Spray-Formed Hot Work Tool Steel: *Wang Cunlong*¹; ¹Guangdong University of Technology

Q-5: Hot Deformation Behavior of Nb Microalloyed Coiled Tubing Steel: *Zhendong Zhang*¹; *Haitao Zhou*²; *Xianghua Liu*¹; *Sijun Li*³; *Guofei Si*¹; *Bingyu Zhang*¹; ¹Northeastern University; ²Central South University; ³Laiwu Iron and Steel Corp

Q-6: Investigation of the Relationship of the Melt Structures and Solidification Behaviors of Cu-Sb70 Alloy Explored by Electrical Resistivity Method: *Yun Xi*¹; *Jin Yu*¹; *Li-Na Mao*¹; *Fang-Qiu Zu*¹; ¹Hefei University of Technology

Q-7: Microstructure of Al₂O₃/YAG/ZrO₂ Eutectic In Situ Composite Prepared by Laser Floating Zone Melting: *Kan Song*¹; *Jun Zhang*²; *Xiaojiao Jia*²; *Haijun Su*²; *Lin Liu*²; *Hengzhi Fu*²; ¹Northwestern Polytechnical university; ²Northwestern Polytechnical university

Q-8: Net Shape Manufacturing of a Novel Cermet Using Self-Propagating High Temperature Synthesis: *Atefeh Nabavi*¹; *Alexander Capozzi*¹; *Sam Goroshin*¹; *David Frost*¹; *Francois Barthelat*¹; ¹McGill University

Q-9: Response Surface Methodology for the Optimization of the Dehydration Curve of Scheelite Concentrate by Microwave Heating: *Lei Guo*¹; *Libo Zhang*¹; *Jinhui Peng*¹; *Xinhui Duan*¹; *Xin Wang*¹; ¹Key Laboratory of Unconventional Metallurgy, Kunming University of Science and Technology

Q-10: Study on Inclusions in 65Mn Thin Slabs Produced by a CSP Process: *Yi Tan*¹; *Huigai Li*¹; ¹Shanghai University, Shanghai, China.

Q-11: The Optimization of Copper Utilization during Decoppering of Technical Lead: *Ahmet Haxhijaj*¹; *Izet Zeqiri*¹; *Bajram Haxhijaj*¹; *Mursel Rama*¹; ¹University of Pristina

Materials Research in Microgravity: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS Extraction and Processing Division, TMS: Process Technology and Modeling Committee, TMS: Solidification Committee

Program Organizers: Robert Hyers, University of Massachusetts; Hani Henein, University of Alberta; Valdis Bojarevics, University of Greenwich; James Downey, NASA; Douglas Matson, Tufts University; Achim Seidel, Astrium; Daniela Voss, ESA

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Room: Atlantic Hall
Location: Dolphin Resort

B-1: Advanced Optical Systems for Materials Science Experiments under Microgravity: *Martin Naegele*¹; *Michael Baumgarten*¹; *Wolfgang Soellner*²; *Achim Seidel*²; ¹OptoPrecision GmbH; ²Astrium

B-2: Containerless Processing on ISS: Ground Support Program for EML: *Stefan Schneider*¹; *Rainer Willnecker*¹; *Angelika Diefenbach*¹; ¹DLR MUSC

B-3: Directional Solidification Experiments on Board the ISS Using MSL: *Daniela Voss*¹; ¹ESA

B-4: EML - A Multi-User Electromagnetic Levitation Facility for Containerless Processing Experiments Onboard the ISS: *Achim Seidel*¹; *Wolfgang Soellner*¹; *Christian Stenzel*¹; ¹Astrium

B-5: EML Experiments on Board the ISS: *Daniela Voss*¹; ¹ESA

B-6: Fluid Flow in Phase Selection Experiments Using Electromagnetic and Electrostatic Levitation: *Briana Tombouljian*¹; *Robert Hyers*¹; *Douglas Matson*²; ¹University of Massachusetts; ²Tufts University

B-7: FMF: An MSL Furnace Insert for Float-zone Crystal Growth on the ISS: *Adam Hess*¹; *Arne Cröll*¹; *Jan Zähringer*¹; *Christian Stenzel*²; *Dirk Bräuer*³; *Harald Sauermann*³; *Volker Uhlig*³; ¹Albert-Ludwigs University Freiburg; ²Astrium; ³Technische Bergakademie Freiberg

B-8: High-Precision Temperature Control of a Crystal Growth Furnace at 1500°C: *Christian Stenzel*¹; *Arne Croell*²; *Adam Hess*²; *Dirk Bräuer*³; *Hartmut Sauermann*³; ¹Astrium; ²University of Freiburg; ³Technical University Freiberg

B-9: Inductive Measurement Device for Microgravity Electromagnetic Levitator: *Georg Lohoefer*¹; *Juergen Brillo*¹; ¹German Aerospace Center, DLR

B-10: In-Situ Observation of Directional Solidification Processes in Transparent Materials on the ISS: *Daniela Voss*¹; ¹ESA

B-11: Investigation of Thermocapillary Convection of High Prandtl Number Fluid under Microgravity: *Ruquan Liang*¹; ¹Northeastern University

B-12: Modeling for ISS Experiments on Transient Nucleation in Glass- and Quasicrystal-Forming Melts: *Xiao Ye*¹; *Kenneth Kelton*²; *Robert Hyers*¹; ¹University of Massachusetts; ²Washington University

B-13: Real Time In-Situ Observations of Equiaxed Dendrite Coherency in Al-Cu Alloys Using High Brilliance 3rd Generation Synchrotron Sources: *Andrew Murphy*¹; *David Browne*¹; *Wajira Mirihanage*²; *Ragnvald Mathiesen*²; ¹University College Dublin; ²Norwegian University of Science and Technology

B-14: Surface Tension and Viscosity of Ni-Al Catalytic Precursor Alloys

Measured by the Oscillating Drop Method on Different Microgravity Platforms: *Rainer Wunderlich*¹; *Hans-Joerg Fecht*¹; ¹Universitaet Ulm

B-15: Truncated Dual Cap Nucleation Site Development: *Douglas Matson*¹; *Paul Sander*¹; ¹Tufts University

B-16: XRMON Modules on Sounding Rockets: *Daniela Voss*¹; ¹ESA

Mechanical Behavior at Nanoscale I: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Nanomechanical Materials Behavior Committee, TMS/ASM: Mechanical Behavior of Materials Committee
Program Organizers: Scott Mao, University of Pittsburgh; Julia R Greer, California Institute of Technology; Jianyu Huang, Center for Integrated Nanotechnologies; Marc Legros, CEMES-CNRS; Ting Zhu, Georgia Institute of Technology

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Room: Atlantic Hall
Location: Dolphin Resort

A-1: Atomistic Prediction of Precipitate Strengthening in Nanoscale Metallic Multilayers: *Niaz Abdolrahim*¹; *Ioannis Mastorakos*¹; *Hussein Zbib*¹; ¹Washington State University

A-2: Atomistic Simulations of the Adhesion of Alumina/epoxy Interfaces Using ReaxFF: *Fidel Valega Mackenzie*¹; *Barend Thijsse*¹; ¹Delft University of Technology



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A-3: Characterization of Coherency Limits in Si/Ge Core-Shell Nanowires Using Molecular Dynamics: *Yumi Park*¹; Alejandro Strachan¹; ¹Purdue University

A-4: Controlling the Lithiation Induced Strain and Charging Rate in Nanowire Electrodes by Coating: *Liqiang Zhang*¹; Xiaohua Liu²; Yang Liu²; Shan Huang³; Ting Zhu³; Liangjin Gui⁴; Scott X. Mao¹; Zhizhen Ye⁵; Chongmin Wang⁶; John P. Sullivan²; Jianyu Huang²; ¹University of Pittsburgh; ²Sandia National Laboratories; ³Georgia Institute of Technology; ⁴Tsinghua University; ⁵Zhejiang University; ⁶Pacific Northwest National Laboratory

A-5: Dislocation-Interface Interaction Mechanisms in Nanoscale Laminates with Enhanced Interface Models: *Firas Akasheh*¹; S. M. Yead Jewel¹; ¹Tuskegee University

A-6: Effect of Hydrogen on Subsurface Deformation during Indentation of Pipeline Steel: *Moo Young Seok*¹; In-Chul Choi¹; Yong-Jae Kim¹; Dong-Woo Suh²; Jae-il Jang¹; ¹Hanyang university; ²GIFT, POSTECH

A-7: Effects of Focused-Ion-Beam Irradiation and Prestraining on the Mechanical Properties of FCC Au Microparticles on a Sapphire Substrate: *Seok-Woo Lee*¹; Dan Mordehai²; Eugen Rabkin²; William Nix¹; ¹Stanford University; ²Technion-Israel Institute of Technology

A-8: Effects of Ti on Electronic Structure and Mechanical Property of Uranium: a First-Principles Study: *Jianbo Qi*¹; Jiayu Zhang¹; ¹Shanghai University

A-9: Investigation of the Crystal Structure on the Nanomechanical Properties of Pulsed Laser Deposited NbN Thin Films: *Cody Wright*¹; M Mamun¹; A Farha¹; Y Ufuktepe²; H Elsayed-Ali¹; A. Elmustafa¹; ¹Old Dominion University; ²Cukurova University

A-10: Investigation of the Indentation Size Effect in FCC Metals Using Activation Volume Analysis: *David Stegall*¹; A Elmustafa¹; ¹Old Dominion University

A-11: Laser Compression of Nanocrystalline Tantalum: *Chia-Hui Lu*¹; Brian Maddox²; Bruce Remington²; Eduardo Bringa³; Megumi Kawasaki⁴; Terence Langdon⁴; Hye-Sook Park²; Bimal Kad¹; Marc Meyers¹; ¹University of California, San Diego; ²LLNL; ³Conicet & ICB, U. N. Cuyo; ⁴University of Southern California

A-12: Lithiation Induced Embrittlement of Multi-Walled Carbon Nanotubes: *Yang Liu*¹; He Zheng²; Xiaohua Liu¹; Shan Huang³; Ting Zhu³; Jiang Wei Wang²; Akihiro Kushima⁴; Nicholas Hudak¹; Xu Huang²; Sulin Zhang⁵; Scott Mao²; Xiao Feng Qian⁶; Ju Li⁴; Jian Yu Huang¹; ¹Sandia National Laboratories; ²University of Pittsburgh; ³Georgia Institute of Technology; ⁴University of Pennsylvania; ⁵Pennsylvania State University; ⁶Massachusetts Institute of Technology

A-13: Mechanical Anisotropy and Texture in Caliber Rolled Twinning-Induced Plasticity Steels: *Young Soo Chun*¹; Junmo Lee¹; You-Hwan Lee²; Kyung-Tae Park³; Chong Soo Lee¹; ¹POSTECH; ²POSCO; ³Hanbat Nat'l Univ.

A-14: Mechanical Behavior and Thermal Stability of Differently Oriented Nanotwinned Ag Films: *Daniel Bufford*¹; Xinghang Zhang¹; Haiyan Wang¹; ¹Texas A&M University

A-15: Mechanical Behavior for Different Cutting Directions on Copper and Rhodium Single Crystals: *Seisuke Kano*¹; Atsushi Korenaga¹; ¹National Institute of Science and Technology (AIST)

A-16: Mechanical Properties and Deformation Mechanism of Nanostructured Two-Phase Fe₃₀Ni₂₀Mn₂₀Al₃₀ Alloy: *Xiaolan Wu*¹; I. Baker¹; ¹Dartmouth College

A-17: Mechanical Properties of Nanostructured TiAlN Based Coatings: Sai Pramod Pemmasani¹; *Koteswararao Rajulapati*¹; Ramakrishna M²; Krishna Valleti²; Ravi Chandra Gundakaram²; Shrikant V Joshi²; ¹University of Hyderabad; ²International Advanced Research Centre for Powder Metallurgy and New Materials

A-18: Mechanics of Individual Amorphous Carbon Nanoparticles from Experiment and Simulation: *Eric Bucholz*¹; Susan Sinnott¹; ¹University of Florida

A-19: Micromechanical Testing of Nanocrystalline BCC Metals: *Jonathan Ligda*¹; Brian Schuster²; Qiuning Wei¹; ¹UNC Charlotte; ²Army Research Laboratory

A-20: Microstructural Changes Across Shear Bands in Nanotwinned Cu Foils Deformed at Room Temperature and 77K: *Timothy Furnish*¹; Andrea Hodge¹; ¹University of Southern California

A-21: Nano-Compression Testing of Freestanding Tetragonal Ni3Al Particles: *Bin Gan*¹; Robert Maaß²; Julia R. Greer²; Sammy Tin¹; ¹Illinois Institute of Technology; ²California Institute of Technology

A-22: Nanoindentation Investigation of VO₂ Films Synthesized by Reactive Bias Target Ion Beam Deposition (RBTIBD): *Cody Wright*¹; M. A. Mamun¹; D. Nminibapiel¹; Wei Cao¹; D. Gu¹; H. Baumgart¹; Jiwei Lu¹; H. Elsayed-Ali¹; ¹Old Dominion University

A-23: Nanomechanical Behavior of Teflon-MWCNT Bilayer Films: *Rachel Schoeppner*¹; Anqi Qiu¹; Douglas Stauffer²; Ryan Major²; Jack Skinner³; Thomas Zifer³; Greg O'Bryan³; Andrew Vance³; William Gerberich⁴; David Bahr¹; Neville Moody³; ¹Washington State University; ²Hysitron Inc.; ³Sandia National Laboratories; ⁴University of Minnesota

A-24: Nanomechanical Properties of Atomic Layer Deposition Sb₂Te₃ Thin Films: *Cody Wright*¹; M Mamun¹; D Gu¹; D Nminibapiel¹; H Baumgart¹; H Robinson²; V Kochergin³; A. Elmustafa¹; ¹Old Dominion University; ²Virginia Tech University; ³MicroXact

A-25: NanoMechanical Properties of Hydrogen Implanted AlN for Layer Transfer by Ion-Induced Splitting: *Cody Wright*¹; M Mamun¹; K Tapily¹; O Moutanabbir²; D Gu¹; H Baumgart¹; A. Elmustafa¹; ¹Old Dominion University; ²Max-Planck Institute

A-26: Phase Field Dislocation Dynamics in Confined Volumes: *Lei Lei*¹; Marisol Koslowski¹; ¹Purdue University

A-27: Processing of ta-C Protective Films on Mold for Glass Lens: Seungkeun Oh¹; *Youngman Kim*¹; ¹Chonnam National University

A-28: Size and Asperity Height Effect on the Contact Hardness in Nanoscale Metallic Asperities Contact : Molecular Dynamics Study: *Hojin Kim*¹; Alejandro Strachan¹; ¹Purdue University

A-29: Size Dependence of Mechanical Properties of Refractory Carbides: *Sara Kiani*¹; Suneel Kodambaka¹; Jenn-Ming Yang¹; ¹UCLA

A-30: Size Effects of Single-Crystal Magnesium: Microcompression Experiments and Modeling: *Cynthia Byer*¹; KT Ramesh¹; ¹Johns Hopkins University

A-31: Strong Sample-Dimension Dependence of Submicro-Sized Single Crystal Mo Pillars: *Ling Huang*¹; Qingjie Li¹; Zhiwei Shan¹; Ju Li²; Jun Sun¹; Evan Ma³; ¹Xi'an Jiaotong University; ²Massachusetts Institute of Technology; ³Johns Hopkins University

A-32: Temperature Effect on Displacement Burst of Iron Nano-Particles: *Qing-Jie Li*¹; Ling Huang¹; Christopher R. Weinberger²; Zhi-Wei Shan¹; Ju Li³; Jun Sun¹; Evan Ma⁴; ¹Center for Advancing Materials Performance from the Nanoscale (CAMP-Nano) & Hysitron Applied Research Center in China (HARCC), State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University; ²Sandia National Laboratories; ³Department of Nuclear Science and Engineering and Department of Materials Science and Engineering, MIT; ⁴Department of Materials Science and Engineering, Johns Hopkins University

A-33: The Role of Stacking Fault Energy and Deformation Twinning on the Indentation Size Effect of FCC Pure Metals and Alloys: *David Stegall*¹; A Elmustafa¹; ¹Old Dominion University

A-34: Time-Dependent Mechanical Behavior of Indium Nanopillars: *In-Chul Choi*¹; Yong-Jae Kim¹; Moo-Young Seok¹; Ting Y. Tsui²; Jae-II Jang¹; ¹Hanyang University; ²University of Waterloo

Mechanical Behavior Related to Interface Physics: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS Materials Processing and Manufacturing Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Jian Wang, Los Alamos National Laboratory; Nathan Mara, Los Alamos National Laboratory; Izabela Szlufarska, University of Wisconsin-Madison; Zhiwei Shan, Xi'an Jiaotong University

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Room: Atlantic Hall
Location: Dolphin Resort

E-1: Delamination Characterization of Bonded Interface Using Surface Based Cohesive Model: Manivannan Ramamurthi¹; *Young Suk Kim*¹; ¹Kyungpook National University, Daegu, South Korea.

E-2: First-Principles Investigation of Grain Boundary Cohesion by Magnesium in Aluminum: *Shengjun Zhang*¹; Oleg Kontsevoi¹; Arthur Freeman¹; Gregory Olson¹; ¹Northwestern University

E-3: In-Situ Fracture Toughness Studies in Magnesium Aluminate Spinel: *Wanjun Cao*¹; Animesh Kundu¹; Mark McLean¹; Martin Harmer¹; Richard Vinci¹; ¹Lehigh University

E-4: Plasticity in Al/Nb Nanoscale Multilayered Materials: Effects of Interface Shear Strength: *Arief Budiman*¹; Youbin Kim²; Kevin Baldwin¹; Nathan Mara¹; Amit Misra¹; Seungmin Han²; ¹Los Alamos National Laboratory (LANL); ²KAIST

E-5: Slip Transfer Across a Cu Bicrystal Interface: *Alankar Alankar*¹; Niraj Gupta²; Shivraj Karewar²; Ricardo Lebensohn¹; Alfredo Caro¹; ¹Los Alamos National Laboratory; ²University of North Texas

E-6: The Effects of Aspect Ratios in Liquid Bridge on Surface Driven Flow under Microgravity JEMISS: *Shinichi Yoda*¹; Satoshi Matsumoto¹; Atsushi Komiya²; ¹JAXA; ²Touhoku University

E-7: The In-situ Intrinsic Stress Measurements of Cu and Al Thin Films: Jun Young Yu¹; *Youngman Kim*¹; ¹Chonnam National University

Nanocomposites: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Composite Materials Committee

Program Organizers: Garth Wilks, Air Force Research Laboratory; Jonathan Spowart, Air Force Research Laboratory; Meisha Shofner, Georgia Institute of Technology; John Zhanhu Guo, Lamar University

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Room: Atlantic Hall
Location: Dolphin Resort

V-1: Formation of Carbides in the Aluminum Matrix Composites Reinforced by Multi-Walled Carbon Nanotubes: *Seoun Shin*¹; Heon Kang¹; Donghyun Bae¹; ¹Yonsei University

V-2: Impact Resistance of Nanostructured Partially Stabilized Zirconia Reinforced Porcelains: *Emmi Ngo*¹; Hanry Yang¹; Ricardo Castro¹; ¹University of California, Davis

V-3: Influence of the Type of Clay on the Morphology of Nanocomposites: *André Rodrigues*¹; Maria Brasileiro¹; Tomas Melo²; Edcleide Araujo²; Ariosvaldo Sobrinho²; Mucio Nobrega¹; ¹UFC; ²UFCEG

V-4: Mechanical Properties of Fe-Based Nanocomposites with Dispersed Multi-Walled Carbon Nanotubes: *Ji-Yeon Suh*¹; Jaehyuck Shin¹; Donghyun Bae¹; ¹Department of Materials Science and Engineering, Yonsei University

V-5: Modeling Elastic Behaviors of Peptide Reinforced Hydrogel Nanocomposites: *Jingjing Qiu*¹; ¹Texas Tech University

V-6: Modification of the Temperatures of Phase Transformations of Alumina by the Insertion of MgO and ZrO₂: *Deise Cristina Rosário*¹; Douglas Gouvêa¹; ¹University of São Paulo

V-7: Role of Nano-Silica on Alkali-Silica Reactivity of Concrete: *Mohammad Islam*¹; ¹UBC

V-8: Thermal Properties of Mg-Nanocomposites Reinforced by CNT in Relation to Pure-Mg: *Sardar Iqbal*¹; ¹Southern Illinois Univ, Carbondale



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Neutron and X-Ray Studies of Advanced Materials V: Centennial: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Chemistry and Physics of Materials Committee

Program Organizers: Rozaliya Barabash, Oak Ridge National Laboratory; Xun-Li Wang, Oak Ridge National Laboratory; Gernot Kostorz, ETH Zurich; Lyle Levine, National Institute of Standards and Technology; Peter Liaw, Univ of Tennessee; Yandong Wang, Beijing Institute of Technology; Brent Fultz, California Institute of Technology

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Room: Atlantic Hall
Location: Dolphin Resort

Funding support provided by: Office of Basic Energy Sciences, U.S. Dept. of Energy, Dr. P. Thiyagarajan

F-1: An Investigation of the Tempering Kinetics and Residual Stress States of a Cryogenically Treated and High Magnetic Field Processed Steel via Neutron Scattering Experiments: *Orlando Rios*¹; Tom Watkins¹; Ling Yang¹; Alexandru Stocia¹; Ben Shassere¹; Don Nicholson¹; Gerry Ludtka¹; Gail Ludtka¹; ¹Oak Ridge National Laboratory

F-2: The Study of Structural Stability for TiSi₂ under High Pressure: *Chunyu Li*¹; Zhenhai Yu²; Jinggeng Zhao¹; Luhong Wang²; Tianquan Lü³; Haozhe Liu²; ¹Brookhaven National Laboratory; ²Argonne National Laboratory; ³Harbin Institute of Technology

Pb-Free Solders and Other Materials for Emerging Interconnect and Packaging Technologies: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS: Electronic Packaging and Interconnection Materials Committee

Program Organizers: Iver Anderson, Ames Laboratory; Sung Kang, IBM; Albert Wu, National Central Univ; Laura Turbini, Research in Motion; Tae-Kyu Lee, Cisco Systems; Govindarajan Muralidharan, Oak Ridge National Lab; John Elmer, Lawrence Livermore National Lab; Yan Li, Intel

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Room: Atlantic Hall
Location: Dolphin Resort

H-1: Effect of Multiple Reflows on Interfacial Reaction and Tensile Property of Sn-xAg-0.5Cu Solder Joints with Cu Substrate: *Long-Tai Chen*¹; ¹National Cheng Kung University

H-2: Microstructure Change of Au Stud Bumps Joined with Sn-3.5Ag Solder with Flip Chip Bonding Parameters: *Young-Kyu Lee*¹; Won-Myoung Ki¹; Jeong-Han Kim²; *Sehoon Yoo*²; Chang-Woo Lee²; ¹University of Science & Technology; ²Korea Institute of Industrial Technology

H-3: Physicochemical Properties of Sb, Sn, Zn and Sb-Sn, SAC and SAC+Bi Alloys: *Tomasz Gancarz*¹; Janusz Pstrus¹; Wladyslaw Gasior¹; Hani Henein²; ¹Institute of Metallurgy and Material Science PAS; ²Department of Chemical and Materials Engineering, University of Alberta, Edmonton, AB, Canada

H-4: The Different Failure Mechanism of the Ni UBM in the Lead-Free Solder Joints under Constant Current Stressing at Various Temperatures: *Chung Kuang Lin*¹; Wei An Tsao¹; Chih Chen¹; ¹National Chiao Tung University

H-5: The Electromigration Behavior of Ni₃Sn₄ in Sn2.5Ag Solder Joints: *Chun-Yi Wu*¹; Chih Chen¹; ¹National Chiao Tung University

H-6: Thermal Cycling Test on Sn2.3Ag Microbump with Different UBM Structure after Heat Treatment: *Chun-Chieh Mo*¹; Yon-Chun Liang²; Chih Chen²; ¹National Chiao Tung University; ²National Chiao Tung University

H-7: Real Time Monitoring of Whisker Growth Failure Using by 3-D Geometry Comb Pattern: *Won Sik Hong*¹; Chul Min Oh¹; Do Seop Kim²; ¹Korea Electronics Technology Institute(KETT); ²Hyundai Motor Company

H-8: Recrystallization-Induced Void Migration in Electroplated Cu Films: *Sunghwan Kim*¹; Jin Yu¹; ¹KAIST

H-9: Vibration Test at Elevated Temperature for Pb-Free Solders: *Yong-Ho Ko*¹; Young-Kyu Lee²; Jeong-Han Kim¹; Sehoon Yoo¹; Chang-Woo Lee¹; ¹Micro-Joining Center, Korea Institute of Industrial Technology, Incheon, 406-840, Korea; ²Dept. of Electronic Packaging Engineering, University of Science & Technology, Daejeon, 305-333, Korea

H-10: Wettability and Interfacial Microstructure of Pb-Free Sn3.5Ag Alloy Powders on Cu Substrate: *Jin Zhao*¹; Weipeng Zhang¹; Tingting Song¹; Yulai Gao¹; Qijie Zhai¹; ¹Shanghai university

Radiation Effects in Ceramic Oxide and Novel LWR Fuels: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Nuclear Materials Committee

Program Organizers: Peng Xu, University of Wisconsin; Jian Gan, Idaho National Laboratory; Ram Devanathan, Pacific Northwest National Laboratory; Edward Lahoda, Westinghouse Electric Company; Michele Manuel, University of Florida; Ramprashad Prabhakaran, Idaho National Laboratory; Todd Allen, University of Wisconsin-Madison

Monday PM
March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

Funding support provided by: The Center for Materials Science of Nuclear Fuel, an Energy Frontier Research Center led by the Idaho National Laboratory

O-1: Microstructural Investigations of Ion (KR, XE) Irradiated CEO₂ and UO₂ With and Without Impurities: *Brian Kleinfeld*¹; Weiyang Chen¹; Bei Ye¹; Yinbin Miao¹; Aaron Oaks¹; James Stubbins¹; ¹University of Illinois at Urbana-Champaign

Randall M. German Honorary Symposium on Sintering and Powder-Based Materials: Poster Session

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division, TMS: Powder Materials Committee

Program Organizers: K. Morsi, San Diego State University; Fernand Marquis, Naval Postgraduate School; John Meyer, Iowa State University; Ahmed El-Desouky, San Diego State University; Eugene Olevsky, San Diego State University

Monday PM Room: Atlantic Hall
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S-1: Effect of Nanosized Cobalt Amounts on WC-Co Sintered Bulks Fabricated by Spark Plasma Sintering (SPS): Joon-Woo Song¹; Sol Lee¹; Rumman Md. Raihanuzzaman¹; Hyoun-Seon Hong²; Soon-Jik Hong¹; ¹Kongju National University; ²Institute for Advanced Engineering(IAE)

Recycling General Sessions: Poster Session

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS Light Metals Division, TMS: Recycling and Environmental Technologies Committee

Program Organizer: Joseph Pomykala, Alter Trading

Monday PM Room: Atlantic Hall
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R-1: AMD Treatment Using Rice Husk as Biosorbent: Flávia Silvas¹; Bianca Medeiros²; Daniella Buzzi³; José Oliveira²; Ivo Schneider⁴; Denise Espinosa³; Jorge Tenório³; ¹Polytechnic School of São Paulo University ; ²Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo; ³Polytechnic School of São Paulo University; ⁴Universidade Federal do Rio Grande do Sul

R-2: Incorporation of Building Rejects in Portland Cement: Shirley Cosin¹; Francisco Valenzuela Diaz¹; ¹University of São Paulo

Refractory Metals 2012: Poster Session

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: Refractory Metals Committee

Program Organizers: Eric Taleff, The University of Texas at Austin; Todd Leonhardt, Rhenium Alloys Inc; Rachel DeLucas, H.C. Starck; Gary Rozak, HC Starck Inc

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J-1: Effect of Al on the Oxidation Behavior of Alloys from Nb-Cr-Si System: Amanda Gutierrez²; Nydia Esparza¹; Brenda Arellano¹; Shailendra Varma¹; ¹UTEP

Solid-State Interfaces II: Toward an Atomistic-Scale Understanding of Structure, Properties, and Behavior through Theory and Experiment: Poster Session

*Sponsored by:*The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division, TMS Structural Materials Division, TMS: Chemistry and Physics of Materials Committee, TMS: Nanomechanical Materials Behavior Committee

Program Organizers: Xiang-Yang Liu, Los Alamos National Lab; Douglas Spearot, University of Arkansas; Guido Schmitz, University of Münster; David Seidman, Northwestern University

Monday PM Room: Atlantic Hall
March 12, 2012 Location: Dolphin Resort

Funding support provided by: Los Alamos National Laboratory

D-1: Adhesion Strength at Cu(111)/ α -Alumina(0001) Interfaces with Metal Dopants in Alumina Dispersion-Strengthened Copper: Kelun Zhao¹; Xuanhui Qu²; Shaojun Liu³; ¹Materials Science and Engineering Division, Shenzhen Graduate School, Harbin Institute of Technology; ²State Key Laboratory for Advanced Metals and Materials, University of Science and Technology Beijing; ³State Key Laboratory for Powder Metallurgy, Central South University

D-2: Atomistic Simulation of Doped (La,Y,Mg) α -Alumina Interfaces for Transparent Ceramic Applications: Abhishek Tewari¹; Sandra Galmarini¹; Paul Bowen¹; ¹Ecole Polytechnique Federale de Lausanne

D-3: Atomistic Simulations of Nanoindentation and Nanoscratching of Thin Films: Xuan Sun¹; Tzu-Ray Shan¹; Simon Phillipot¹; Susan Sinnott¹; ¹University of Florida

D-4: Grain Boundary - Dislocation Interaction: Linking Molecular Dynamics and Dislocation Dynamics: Sebastian Echeverri Restrepo¹; Barend Thijssse¹; Lucia Nicola¹; Xiaoming Liu²; Erik van der Giessen²; ¹TU Delft; ²University of Groningen

D-5: In Situ TEM investigation of Electrical Current Effect on Aluminum Interconnect: Degang Xie¹; Zhiwei Shan¹; ¹Center for Advancing Materials Performance from the Nanoscale (CAMP Nano)

D-6: Phase Field Crystal Simulation of Curvature Driven Grain Boundary Migration: Vishal Yadav¹; Nele Moelans¹; ¹Katholieke Universiteit Leuven

D-7: Quantification of Compositional Effects on Transformation Kinetics in High Strength Low Alloy Steels Using In Situ TEM: Asher Leff¹; Michael Grimes²; Nerea Isasti³; Christopher Winkler¹; Pello Uranga³; Mitra Taheri¹; ¹Drexel University; ²Lehigh University; ³University of Navarra

D-8: Segregation-Induced Phase Transformation on Grain Boundaries in Fe-Mn: Michael Herbig¹; Pyuck-Pa Choi¹; Dirk Ponge¹; Dierk Raabe¹; ¹Max-Planck-Institut für Eisenforschung GmbH

D-9: Study of Shear Behavior of Al, TiN, and Their Interface Using *ab initio* Method: Satyesh Yadav¹; Xiang-Yang (Ben) Liu¹; Rampi Ramprasad²; Amit Misra¹; ¹Los Alamos National Laboratory; ²Institute of Materials Science, CMBE

D-10: The Effect of Molybdenum on Nb,Ti(C,N) Precipitate Evolution and Grain Refinement in a High-Temperature Carburizing Steel: Charles Enloe¹; John Speer¹; Kip Findley¹; ¹Colorado School of Mines, Advanced Steel Processing and Products Research Center



TMS 2012

141st Annual Meeting & Exhibition

T.T. Chen Honorary Symposium on Hydrometallurgy, Electrometallurgy and Materials Characterization: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Extraction and Processing Division, TMS: Hydrometallurgy and Electrometallurgy Committee, TMS: Materials Characterization Committee

Program Organizers: Shijie Wang, Rio Tinto Kennecott Utah Copper; J. E. Dutrizac, CANMET; Michael Free, University of Utah; J. Y. Hwang, Michigan Technological University; Daniel Kim, Rio Tinto Kennecott Utah Copper

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Funding support provided by: Rio Tinto Kennecott Utah Copper, ASARCO, and Freeport McMoRan

P-1: A Kinetics Study on the Hydrometallurgical Recovery of Vanadium from LD Converter Slag in Alkaline Media: Fereshteh Rashchi¹; ¹University of Tehran

P-2: Annealing Effects in Martensitic Transformation Temperature of the Ni-Ti Shape Memory Alloy Rapidly Solidified: *Walman Castro*¹; Carlos de Araújo¹; George Anselmo¹; ¹Universidade Federal de Campina Grande

P-3: As(III) Oxidation with Bacteria and AP: *Qian Li*¹; Qiong Deng¹; Hong-Jing Yuan¹; Yong-Bin Yang¹; Tao Jiang¹; ¹Central South University

P-4: Comprehensive Utilization of Waste Printed Circuit Boards: *Yu Xia*¹; Long-Sheng Yi¹; Qi-Ming Feng¹; Qian Li¹; ¹Central South University

P-5: Dephosphorization of Yunnan Refractory High- Phosphorus Low-Manganese Ore by Shaking Table and Hydrometallurgical Processing: Guodong Lai¹; Zebiao Zhang¹; Jinhui Peng¹; Lijuan Chu¹; Shixing Wang²; ¹Faculty of Metallurgy and Energy Engineering; ²Yunnan Institute of Product Quality Supervision and Inspection

P-6: Dissolution Behavior of Impurities in Scheelite Mineral in Oxalic Acid Solutions: Ahmet Kalpaklı¹; Sedat Ilhan¹; *Cem Kahruman*¹; Ibrahim Yusufoglu¹; ¹Istanbul University

P-7: Effect of Different Parameters on Synergistic Separation of Nickel and Cadmium from Sulphate Solutions using D2EHPA and Cyanex 302: *Ataollah Babakhani*¹; Fereshteh Rashchi¹; Ehsan Vahidi¹; Alireza Zakeri²; ¹University of Tehran; ²Iran University of Science & Technology

P-8: Electrochemical Reduction of TiO₂-Rich Slag to High-Titanium Ferroalloy in the CaCl₂-NaCl Melt: *Qian Xu*¹; ¹Northeastern University

P-9: Evaluation of Banana Fibers Density with Different Diameters: *Nathalia Rosa*¹; Lucas Martins¹; Sergio Monteiro¹; ¹UENF

P-10: Interdiffusion Studies between Ti-5Ta-2Nb Alloy and 304L Austenitic Stainless Steel Joined by Explosive Cladding Process: *Sudha Chervathur*¹; Prasanthi T.N¹; Saroja S¹; Vijayalakshmi M¹; ¹Indira Gandhi Centre for Atomic Research

P-11: Leaching S from Pressure Acid Leaching Residue of Zinc Concentrate: Parameters Optimization Using Response Surface Methodology: *Lijuan Chu*¹; Zebiao Zhang¹; Peng Peng²; Guodong Lai¹; Guo Cheng¹; ¹Kunming University of Science and Technology; ²University of Minnesota

P-12: Measurement of Contact Angle for Iron Ore Particles: *Xiaobo Huang*¹; Xuewei Lv¹; Chenguang Bai¹; Rende Zhang¹; Maojun Zhou²; ¹College of Materials Science and Engineering, Chongqing University; ²Ironmaking plant, Baoshan Iron & Steel Co., Ltd.

P-13: Mixture Design Applied to the Electrochemical Reduction Of CaWO₄ to W: *Metehan Erdogan*¹; Ishak Karakaya¹; Orhan Gökçe Göksu²; ¹Department of Metallurgical and Materials Engineering, Middle East Technical University; ²Other

P-14: Preparation and Characterization of PBT/Clay Nanocomposite: Mariana Sartori¹; Rene Oliveira¹; Francisco Diaz²; Vijaya Rangari³; Angel Ortiz¹; *Esperidiana Moura*⁴; ¹Instituto de Pesquisas Energéticas e Nucleares - IPEN-CNEN/SP; ²Universidade de São Paulo - USP; ³Tuskegee University; ⁴Instituto de Pesquisas Energéticas e Nucleares - IPEN-CNEN/SP

P-15: Removal of Pb(II) by Modified Watermelon Peel Adsorbent: *Kai Huang*¹; Lianyun Liu¹; Bo Jiang¹; Hongmin Zhu¹; ¹University of Science and Technology Beijing

P-16: Sulphuric Acid Leaching Germanium from Germanium Dust and Fume: Process Optimization Using Response Surface Methodology: *Wankun Wang*¹; Jinhui Peng¹; Zebiao Zhang¹; Shixing Wang¹; ¹Kunming University of Science and Technology

P-17: Surfaces Improvement by Mecano-Chemicals Processes: *Isaias Hilerio*¹; Miguel A. Barrón¹; Roberto T. Hernández¹; Alejandro Altamirano¹; ¹UAM Azcapotzalco

P-18: The Effect of Temperature on Complex Permittivity and Microwave Absorption Properties of an Ilmenite Concentrate at 2450MHz: Chenhui Liu¹; *Libo Zhang*¹; Jinhui Peng¹; Bingguo Liu¹; Hongying Xia¹; Wei Li¹; ¹Key Laboratory of Unconventional Metallurgy, Kunming University of Science and Technology

P-19: Thermal Characterization of Jute Fibers by TGA/DTG and DSC: *Isabela Silva*¹; Victor Silva¹; Alice Bevitori¹; Sergio Monteiro¹; ¹UENF

P-20: Thermal Decomposition Kinetics of the Thermal Decomposition Products of Ammonium Heptamolybdate Tetrahydrate in Air and Inert Gas Atmospheres: *Hande Çavusoglu*¹; Cem Kahruman¹; Ibrahim Yusufoglu¹; ¹Istanbul University

Ultrafine Grained Materials VII: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS/ASM: Mechanical Behavior of Materials Committee, TMS: Nanomechanical Materials Behavior Committee, TMS: Shaping and Forming Committee
Program Organizers: Suveen Mathaudhu, U.S. Army Research Office; Xiaoxu Huang, Risø National Laboratory for Sustainable Energy, Technical University of Denmark; Hyoung Seop Kim, POSTECH; Terence Langdon, University of Southern California; Terry Lowe, Manhattan Scientifics, Inc.; Ruslan Valiev, Ufa State Aviation Technical University; Xiaolei Wu, Institute of Mechanics, Chinese Academy of Sciences; Michael Zehetbauer, University of Vienna

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T-1: Application of High-Pressure Torsion for Thick Samples: *Hideaki Iwaoka*¹; Zenji Horita¹; ¹Kyushu University

T-2: Bulk Ultra-fine Grained Materials from Reprocessed Machined Chips: *S Giribaskar*¹; Gouthama¹; ¹Indian Institute of Technology Kanpur

T-3: Carbide Free Bainitic Steel: *Xiaoxu Zhang*¹; ¹McMaster University

T-4: Characterization of Al-Al Laminates Processed by ECAP: *Sapthagireesh Subbarayan*¹; Hans Jorgen Roven¹; ¹NTNU

T-5: Concurrent Structural Evolution of the FCC and BCC Phases in Duplex Stainless Steel Induced by High-Pressure Torsion: *Yang Cao*¹; Yanbo Wang¹; Xiaozhou Liao¹; Roberto Figueiredo²; Simon Ringer¹; Terence Langdon³; Yuntian Zhu⁴; ¹The University of Sydney; ²Federal University of Minas Gerais; ³University of Southern California; ⁴North Carolina State University

T-6: Dynamic Torsion Deformation of Ultrafine Grained Ferrite-Martensite Steel Fabricated by ECAP: *Hyunmin Kim*¹; Young Gun Ko²; Dong Hyuk Shin³; Sunghak Lee¹; ¹POSTECH; ²Yeungnam University; ³Hanyang University

T-7: Effect of Preheating on Microstructure and Mechanical Properties of Ultrafine Grained AA1050 Deformed by Accumulative Roll Bonding (ARB) Method: *Kuiyu Cheng*¹; Cheng Lu¹; Lihong Su¹; Kiet Tieu¹; ¹University of Wollongong

T-8: Effects of Ageing after Cryogenic and Warm Rolling on Mechanical Properties of Al 6061 Alloy: *Nageswararao Palukuri*¹; Jayaganthan R¹; ¹IIT Roorkee

T-9: Effects of Ball Milling and High-Pressure Torsion for Improving Mechanical Properties of Al-Al₂O₃ Nanocomposites: *Maki Ashida*¹; Zenji Horita¹; ¹Kyushu University

T-10: Effects of High-Pressure Torsion Parameters on the Microstructure and Mechanical Properties of Bulk Metallic Glasses: *Bal Bashyal*¹; Yanbo Wang¹; Dongdong Qu²; Megumi Kawasaki³; Xiaozhou Liao¹; Simon Ringer¹; Terence Langdon³; Jun Shen²; ¹The University of Sydney; ²Harbin Institute of Technology; ³University of Southern California

T-11: Engineering Surface Microstructures Using Severe Plastic Deformation in Machining: M. Ravi Shankar¹; *Saurabh Basu*¹; Sepideh Abolghasem¹; ¹University of Pittsburgh

T-12: Enhanced Mechanical Properties of Ultrafine Grained Titanium Deposits Fabricated via High-Velocity Impacts of Micron-Sized Particles: *Gyuyeol Bae*¹; Jae-Il Jang¹; Changhee Lee¹; ¹Hanyang University

T-13: Estimation of Friction under High Pressure – Application to High Pressure Tube Twisting (HPTT): *Arnaud Pougis*¹; Jean-Jacques Fundenberger¹; Laurent Faure¹; Sylvain Philippon¹; Roxane Arruffat¹; Laszlo Toth¹; ¹University Paul Verlaine

T-14: Evaluation of Hardness Homogeneity and Mechanical Properties in an Aluminum Alloy Processed by High-Pressure Torsion: *Shima Sabbaghianrad*¹; Megumi Kawasaki¹; Terence Langdon¹; ¹University of Southern California

T-15: Fatigue Behavior of Friction Stir Processed Ultrafine Grained 8242 Al Alloy: *Mageshwari Komarasamy*¹; Nilesh Kumar¹; Rajiv S. Mishra¹; ¹Missouri University of Science and Technology

T-16: High Strength Al 6061 Alloy by the Application of Cryogenic and Warm Rolling: *Ui Gu Kang*¹; HoJin Lee¹; WonJong Nam¹; ¹Kookmin Univ.

T-17: Influence of Deformation Route on Microstructure Evolution of Ferrite Steels via Shear Rolling with Differential Speeds: *Jae Sik Lee*¹; Jordan Suharto¹; Young Gun Ko¹; ¹Yeungnam University

T-18: Influence of Texture on the Strength and Fracture Behavior of Severe Plastically Deformed Nickel: *Georg Rathmayr*¹; Reinhard Pippan¹; ¹Erich Schmid Institute of Materials Science

T-19: Influence of Ultrafine Grained Microstructure on the Superplastic Deformation Mechanism of 7075 Al Alloy: *Arun Mohan*¹; Partha De¹; Rajiv Mishra¹; ¹Missouri University of Science and Technology

T-20: Microstructure and Mechanical Properties of 5005/6061 Laminated Composite Processed by Accumulative Roll Bonding: *Lihong Su*¹; Cheng Lu¹; Guanyu Deng¹; Kuiyu Cheng¹; Kiet Tieu¹; Xudong Sun¹; ¹University of Wollongong

T-21: Microstructure Evolution in an UFG Al-7Mg Alloy Processed by ECAP during Subsequent Annealing: *Min Zha*¹; Yanjun Li²; Ragnvald Mathiesen³; Hans Roven¹; ¹Department of Materials Science & Engineering Norwegian University of Science & Technology (NTNU); ²Sintef, Materials and chemistry; ³Department of Physics, Norwegian University of Science & Technology (NTNU)

T-22: Novel C-Extrusion towards Ultra-Fine Grained Aluminum: *Terje Hals*¹; Hans Roven¹; ¹Norwegian University of Science and Technology

T-23: Plasmanitriding of HSLA Steels with Ultrafine Grained (UFG) Surface Layers: *Jennifer Schuster*¹; Enrico Bruder¹; Clemens Mueller¹; ¹TU Darmstadt

T-24: Production of High-Strength Ultra-Fine Grained Joints in AA2014 by Multiple Pass Friction Stir Welding: *Geo Harrison*¹; Preetam Anbukarasu¹; Ganapathy Subramanian¹; ¹College of Engineering Guindy, Anna University

T-25: Recrystallization Microstructure and Microtexture in an Ultrafine-Grained AlMgSi Alloy: *Aicha Loucif*¹; Thierry Baudin²; François Brisset²; Roberto Figueiredo³; Rafik Chemam¹; Terence Langdon⁴; ¹University Annaba; ²University Paris-Sud France; ³Federal University of Minas Gerais; ⁴Departments of Aerospace & Mechanical Engineering

T-26: Repetitive Corrugation and Straightening Rolling as a State of the Art Bulk Deformation Procedure: Arya Mirsepassi¹; *Mahmoud Nili-Ahmadaadi*¹; Mohammad Habibi-Parsa¹; Hadi Ghasemi-Nanesa¹; ¹University of Tehran

T-27: Scaling up Equal-Channel Angular Pressing and its Effect on Billet Homogeneity: *Stephanie Hunger*¹; Martin F.-X. Wagner¹; Matthias Hockauf¹; ¹Chemnitz University of Technology

T-28: Severe Plastic Deformation on Surfaces by Exploiting Transitions in Material Removal by Machining: *Yang Guo*¹; Narayan Sundaram¹; Srinivasan Chandrasekar¹; ¹Purdue University

T-29: Synthesis and Mechanical Properties of Cnt Reinforced Copper Based Nanocomposites: *Koteswararao Rajulapati*¹; K Sreelatha¹; V V S S Srikanth¹; K Bhanu Sankara Rao¹; ¹University of Hyderabad

T-30: Synthesis, Microstructure and Mechanical Behavior of Bulk Nanostructured Cu-30%Zn Alloy by Spark Plasma Sintering of Cryomilled Powders: *Haiming Wen*¹; Troy Topping¹; Enrique Lavernia¹; ¹University of California, Davis

T-31: The Effect of Alloying with Hafnium on the Thermal Stability of Chromium Bronze after Severe Plastic Deformation: *Daria Shangina*¹; Natalia Bocharov¹; Sergey Dobatkin¹; ¹A.A. Baikov Institute of Metallurgy and Materials Science, Russian Academy of Sciences

T-32: The Effects of Deformation Strain and Temperature on Microstructures and Tensile Properties in a Commercial Purity Aluminium: *ShinWoong Jeong*¹; Ho Jin Lee¹; Won Jong Nam¹; ¹Kookmin University



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T-33: Transmission Electron Microscopy and Synchrotron X-ray Texture Analysis of BCC Metals Processed by High Pressure Torsion: *Jonathan Ligda*¹; Brian Schuster²; Yang Ren³; Qiuming Wei¹; ¹UNC Charlotte; ²Army Research Laboratory; ³Argonne National Laboratory

T-34: UFG-Surface Layer on DD11 Mild Steel Profiles Produced by Linear Bend Splitting (LBS): *Vanessa Kaune*¹; Clemens Müller¹; ¹Technische Universität Darmstadt

T-35: Ultrafine Grain Refinement of Biomedical Co-Cr-Mo Alloy from Cryogenic Burnishing for Enhanced Wear Resistance: *S. Yang*¹; Z. Pu¹; O.W. Dillon¹; D.A. Puleo¹; J.C. Outerio²; I.S. Jawahir¹; ¹University of Kentucky; ²Catholic University of Portugal

T-36: Unusual Martensite Decomposition in a UFG Cu-Al Alloy: *Guofan Zhang*¹; Xavier Sauvage²; Jing Tao Wang¹; Nong Gao³; Terence G. Langdon⁴; ¹NUST; ²University of Rouen; ³University of Southampton; ⁴University of Southern California

T-37: Wear Resistance of Nanocrystalline Cu-Diamond Composites Processed by High Pressure Torsion: *Eun Yoo Yoon*¹; Dong Jun Lee¹; Taek-Soo Kim²; Ha-Guk Jeong²; Chong Soo Lee¹; Hyoung Seop Kim¹; ¹POSTECH; ²Korea Institute of Industrial Technology (KITECH)

General Poster Session

Sponsored by: The Minerals, Metals and Materials Society, 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

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W-1: A Novel Simultaneous Thermal Analysis (STA) Furnace with Tungsten Heating Element for Measurements under High-Purity Inert Gas Atmospheres and High Vacuum: *Ekkehard Post*¹; Bob Fidler²; ¹NETZSCH Geraetebau GmbH; ²NETZSCH Instruments North America, LLC

W-2: A Study on Fatigue Strength of Railroad Truck: *Sung Cheol Yoon*¹; Jeongguk Kim¹; Sung Hyuk Park¹; Dong Hoe Koo¹; Kang Youn Choe¹; ¹Korea Railroad Research Institute

W-3: A Study on Production of Fe-Cr-Ni-Ti Alloys by Metallurgical Processes: *Cem Colakoglu*¹; Murat Alkan¹; Onuralp Yücel¹; ¹Istanbul Technical University

W-4: Ab Initio Optical Properties of Orthorhombic CdGeO₃: *Eudenilson Albuquerque*¹; Umberto Fulco¹; ¹Universidade Federal do Rio Grande do Norte

W-5: An Investigation of the Electrochemical Properties of TiAlCrN PVD Coated in STS316: *Min-Seok Moon*¹; Kee-Do Woo²; Min-Goo Lee²; Je-Ha Oh³; Shin-Jae Kang⁴; Dae-Up Kim⁵; ¹Chonbuk National University, Jeonju Institute of Machinery Carbon Composites; ²Chonbuk National University; ³Jeonju Institute of Machinery and Carbon Composites; ⁴Chonbuk National University, Jeonju Institute of Machinery and Carbon Composites; ⁵Korea Institute of Industrial Technology

W-6: Atomistic Simulations of Oxygen Diffusion in Alumina: Ulrich Aschauer¹; *Abhishek Tewari*²; Paul Bowen²; ¹Eidgenössische Technische Hochschule Zurich; ²Ecole Polytechnique Federale de Lausanne

W-7: Bonding between Al and Cu by both Vacuum Hot Pressing and Solid-Liquid Hybrid Sheet Fabrication Process: *Kwang Seok Lee*¹; Yong-Nam Kwon¹; ¹Korea Institute of Materials Science

W-8: Characterization and Performance of Novel Amorphous Oxide Anodes for Chlorine Evolution in Industrial Electrolysis Using Chloride-Based Solutions: *Akari Miwa*¹; Masatsugu Morimitsu¹; ¹Doshisha University

W-9: Characterization of an Aged Ti49Ni26Au25 Shape Memory Alloy: *Todd Butler*¹; Mohamed Abdalla²; B. Hornbuckle¹; Ronald Noebe³; Glen Bigelow³; Gregory Thompson¹; Mark Weaver¹; ¹Univ of Alabama; ²Tuskegee University; ³NASA Glenn Research Center

W-10: Characterization of Oxide Bifilm Inclusion Defects in Vacuum Cast Ni-Base Superalloy: *Max Kaplan*¹; Gerhard Fuchs¹; ¹University of Florida

W-11: Combined Cavitation and Particle Erosion of Brass: Amarendra H.J.¹; *Gajanan Chaudhari*¹; S.K. Nath¹; ¹IIT Roorkee

W-12: Determination of Interfacial Heat Transfer and Air-gap Formation during ingot Casting into Permanent Metal Moulds: *Jason Swan*¹; ¹University of Birmingham

W-13: Development of 3D Porous Nickel Electrodes for Hydrogen Production: *Valentin Pérez-Herranz*¹; Isaac Herráiz-Cardona¹; Emma Ortega¹; José Garcia-Antón¹; ¹Universidad Politécnica de Valencia

W-14: Development of Fretting Fatigue Parameter: *Hyukjae Lee*¹; ¹Andong National University

W-15: Development of Ru_{1-x}Ti_xO₂/Ti Anodes by Low Temperature Thermal Decomposition for Nickel Electrowinning: *Masaru Matsuda*¹; Masatsugu Morimitsu¹; ¹Doshisha University

W-16: Effect of Al₂Ca Addition and Mg Content on Microstructure and Tensile Properties of Diecast Al-9Si-2Cu-Mg Alloys: *Jung Ho Seo*¹; Nam-Seok Kim¹; Young-Ok Yoon¹; Shae K. Kim¹; ¹Korea Institute of Industrial Technology

W-17: Effect of Be and CaO on the Ignition Resistance of Mg Melts: *Lee Jin-Kyu*¹; Yang Won-Seok¹; Kim Shae K.¹; ¹Korea Institute of Industrial Technology

W-18: Effect of Ca Addition on Creep and Mechanical Properties in Mg-4Zn Alloys: *Gun Young Oh*¹; Hyun Kyu Lim¹; Shae K Kim¹; ¹KITECH

W-19: Effect of Carbon on Structural Changes in Ni₃Al Phase: Andrzej Janas¹; Ewa Olejnik¹; Beata Grabowska¹; *Jacek Nawrocki*²; ¹AGH University of Science and Technology; ²WSK Rzeszow S.A.

W-20: Effect of Carbon on Wear Resistance in Self-Lubricating Fe-Cr-C-Mn-Cu Alloys: Ki Nam Kim¹; *Myung Chul Park*¹; Gyeong Su Shin¹; Min Ho Shin¹; Seon Jin Kim¹; ¹Hanyang Univ.

W-21: Effect of Dispersed SiC and Y₂O₃ Particles on the High-Temperature Oxidation of AZ91D Magnesium Alloys: *Min Jung Kim*¹; Chenguang Zhao¹; Seulki Kim¹; Dong Bok Lee¹; ¹Sungkyunkwan University

W-22: Effect of Hydrothermal Process on the Relative Surface Area of Porous Ni-Based BMG Foam: *Ji Su Kim*¹; Do-Hyang Kim²; Min-Ha Lee¹; ¹Kitech; ²Yonsei University

W-23: Effect of Porosity on Room Temperature Thermal Conductivity and Mechanical Properties of Porous Ti₂AlC: *Liangfa Hu*¹; Sandip Basu²; Rogelio Benitez²; Ibrahim Karaman¹; Miladin Radovic¹; ¹Materials Science and Engineering Program, Texas A&M University; ²Department of Mechanical Engineering, Texas A&M University

W-24: Effect of Powder Morphology, Powder Preheating, Nozzle Geometry on the Properties and Deposition Behavior of Titanium Coating in Cold Spray: *Kee-Ahn Lee*¹; Jae-Nam Hwang¹; Ji-Sang Yu¹; Hyung-Jun Kim²; ¹Andong National University; ²RIST

W-25: Effect of Processing Parameters on Morphology of Electrodeposited CZTS Thin Films: *Marilene Serna*¹; Eguiberto Galego¹; Lalgudi Ramanathan¹; ¹CNEN-IPEN/SP

W-26: Effect of Reactive Extrusion on the Mechanical Properties of PLA Blends: *Gustavo Brito*¹; Shirley Cavalcanti¹; Pankaj Agrawal¹; Edcleide Araujo¹; Tomás Mélo¹; ¹Federal University of Campina Grande - UFCG

W-27: Effect of the Seed Layer on the Growth of ZnO Nanorod Arrays: *Kyung-Bong Park*¹; Jun-Ho Shin¹; Hyukjae Lee¹; ¹Andong National University

W-28: Effect of Thiodiglycolamide Addition to Di-n-hexyl Sulfide on the Pd(II) Extraction Rate: *Hirokazu Narita*¹; Mikiya Tanaka¹; Shinji Ueno²; ¹National Institute of Advanced Industrial Science and Technology; ²N. E. CHEMCAT

W-29: Effect of TiO₂ Composite Photoelectrode on the Photovoltaic Efficiency of Dye-Sensitized Solar Cells: *Kyung-Bong Park*¹; Jin-Il Park¹; Hyukjae Lee¹; ¹Andong National University

W-30: Effects of Different Gas Additions in Hydrogen for Hydrogen Storage Capacity on Li-Based Hydrides after Pressure Cycling: *Wen-Ming Chien*¹; Joshua Lamb¹; Dhanesh Chandra¹; ¹University of Nevada, Reno

W-31: Effects of Heat Treatment on the Anisotropic Fatigue Behavior of Rolled Aluminum 2024: *Jaclyn Avallone*¹; ¹ASU

W-32: Effects of Modified Sintering on Mechanical Properties of Nd-Fe-B Sintered Magnets: *Jin Woo Kim*¹; Se Hoon Kim¹; Sun Yong Song¹; Young Do Kim¹; ¹Hanyang University

W-33: Effects of Mo, W, Si on the Solid Particle Erosion Resistance of Austenitic Fe-12Cr-0.4C-5Mn-xMo/W/Si Alloys: *Ki Nam Kim*¹; Hye Won Kim¹; Jae Yong Yun¹; Jun Ki Kim²; Seon Jin Kim¹; ¹Hanyang Univ.; ²Korea Institute of Industrial Technology

W-34: Effects of Pulsed Magnetic Annealing on the Grain Boundary of Primary Recrystallized Microstructure in the Grain-Oriented Silicon Steel: *Junjun Huang*¹; Lihua Liu¹; Xin Xia¹; Xiang Jiang¹; Lijuan Li¹; Qijie Zhai¹; ¹Shanghai University

W-35: Elastic Properties of Ti-Nb-Ta-Zr-O Alloys: *Masakazu Tane*¹; Takayoshi Nakano²; Shigeru Kuramoto³; Masashi Hara³; Mitsuo Niinomi⁴; Naohisa Takesue⁵; Takeshi Yano⁵; Hideo Nakajima¹; ¹The Institute of Scientific and Industrial Research, Osaka University; ²Graduate School of Engineering, Osaka University; ³Toyota Central Research and Development Laboratories Incorporated; ⁴Institute for Materials Research, Tohoku University; ⁵Graduate School of Science, Fukuoka University

W-36: Electrochemical Capacitance of Polyaniline, Evaluated in Acid and Neutral Systems: *Omar Martinez Alvarez*¹; Ma. Concepcion Arenas Arrocena²; Héctor Hugo Rodríguez Santoyo¹; José Ulises Cruz Perez¹; ¹Universidad Politécnica de Guanajuato; ²Universidad Nacional Autónoma de México

W-37: Electrochemical Recovery of Zinc Present in the Spent Pickling Baths Coming from Hot Dip Galvanizing Processes: *Valentín Pérez-Herranz*¹; Jordi Carrillo-Abad¹; Montserrat Garcia-Gabaldón¹; Emma Ortega¹; ¹Universidad Politécnica de Valencia

W-38: Electronic Transport in Quasiperiodic Graphene p-n-p Junctions: *Manoel Vasconcelos*¹; Luciano da Silva¹; ¹Universidade Federal do Rio Grande do Norte

W-39: Estimating Stress Exponent of Advanced Materials through Spherical Indentation Creep Test: *In-Chul Choi*¹; Byung-Gil Yoo¹; Yong-Jae Kim¹; Moo-Young Seok¹; Jae-il Jang¹; ¹Hanyang University

W-40: Evaluation of Mechanical Properties of Polymer Matrix with Bionanocomposites Poly (Lactid Acid) - PLA: *Shirley Cavalcanti*¹; Gustavo Brito¹; Pankaj Agrawal¹; Edcleide Araújo¹; Tomás Mélo¹; ¹UFCG

W-41: Evaluation of Structural Strength in Tank Car: *Sung Cheol Yoon*¹; Jeongguk Kim¹; ¹Korea Railroad Research Institute

W-42: Evolution of Internal Strain and Microstructure in Depleted Uranium in the Presence of Hydrides: *Elena Garlea*¹; T. A. Sisneros²; D. W. Brown²; S. C. Vogel²; J. S. Morrell¹; ¹Y-12 National Security Complex; ²Los Alamos National Laboratory

W-43: Existence of Niobium in Ductile Iron and Its Effect on the Morphology of Graphite Ball: *Sun Xiaoliang*¹; ¹Shanghai University

W-44: Experimental Indicators of Materials Processing Progress in Mechanical Alloying: *Priya Radhi Santhanam*¹; Edward Dreizin¹; ¹New Jersey Institute of Technology

W-45: Experimental Study on the Behavior of Slag Entrapment and Inclusion Removal in 44 t Ladle with Argon Blowing: *Shu-Guo Zheng*¹; ¹Northeastern University

W-46: Fabrication and Property Evaluation of Titanium Sputtering Target by Spark Plasma Sintering: *Hyun-Kuk Park*¹; Ik-Hyun Oh¹; Hee-Jun Youn¹; Jung-Han Ryu¹; ¹KITECH / Automotive Components Center

W-47: Fabrication of Lotus-Type Porous Copper by Centrifugal Casting Technique: *Yun-Soo Lee*¹; Hyeong-Tae Kim¹; Myoung-Gyun Kim²; Soong-Keun Hyun¹; ¹Inha University; ²Research Institute of Industrial Science & Technology (RIST)

W-48: Fabrication of Porous Cu by Freezing CuO/Camphor-Naphthalene Slurry: *Myung-Jin Suk*¹; Sung-Tag Oh²; Si-Young Chang³; ¹Kangwon National University; ²Seoul National University of Science and Technology; ³Korea Aerospace University

W-49: Fabrication of Sintered-Body Ti from Hydride Dehydride Ti Powder for Machine Tool and It's Mechanical Properties: *Ik-Hyun Oh*¹; Hyun-Kuk Park¹; ¹KITECH / Automotive Components Center

W-50: Finite Element Simulation of the Roll Forming Process of HSLA Steel Profiles: *Guadalupe Maribel Hernández Muñoz*¹; Patricia del C. Zambrano Robledo¹; Martha Patricia Guerrero Matal¹; Luis Leduc Lezama¹; ¹Universidad Autonoma de Nuevo Leon

W-51: First-Principles Coupled Calphad Modeling of BaO-TiO₂ and La₂O₃-TiO₂ Pseudo-Binary Systems: *Lei Zhang*¹; Chad Althouse¹; James Saal²; Dongwon Shin³; Shunli Shang¹; Yi Wang¹; Zi-Kui Liu¹; ¹Pennsylvania State University; ²Northwestern University; ³Oak Ridge National Laboratory

W-52: Friction and Wear of AZ31B Magnesium Alloy during Sliding against Tool Steel: *Yong-Suk Kim*¹; Hyuk Woo Kwon¹; ¹Kookmin University

W-53: Friction Stir Welding of High Melting Temperature Material Plate: *Sang-Hyuk Kim*¹; Kwang-Jin Lee¹; Ik-Hyun Oh¹; Kee-Do Woo²; ¹Korea Institute of Industrial Technology; ²Chonbuk National University

W-54: Grain Refining Effect of Al₂Ca in A383.0 Al Alloy: *Nam-Seok Kim*¹; Jung-Ho Seo¹; Young-Ok Yoon¹; Shae K. Kim¹; ¹Korea Institute of Industrial Technology

W-55: Heat and Moisture Transfer and Shrinkage during Drying of Ceramic Materials: *José Nascimento*¹; Ariosvaldo Sobrinho¹; Antonio Lima¹; Luiz Pontes²; Mirtes Carvalho³; Karla Campos⁴; ¹UFCG; ²LMPC/UFPB; ³UAEC/UFCG; ⁴UFCG/LMI



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W-56: Hidrotalcite with Gentamicine, of the Type Mg_{0.68}Al_{0.32}(OH)₂(NO₃)_{0.32}·0.1H₂O, Formed by Chemical Coprecipitation in Controlled Atmosphere: *Hector Hugo Rodriguez-Santoyo*¹; Omar Martínez-Alvarez²; ¹Universidad Politecnica de Guanajuato

W-57: High Temperature Compressive Deformation Behavior of Ni-Fe-Cr-Al Based Porous Metal: Sung-Whan Choi¹; Jung-Yeol Yun²; Young-Min Kong³; Byung-Kee Kim³; *Kee-Ahn Lee*¹; ¹Andong National University; ²Korea Institute of Materials Science; ³University of Ulsan

W-58: High Temperature Mechanical Behavior Fe-12Cr ODS Containing Nb: *SungSoo Kim*¹; Dae Whan KIM¹; Jin Sung Jang¹; ¹Korea Atomic Energy Research Institute

W-59: Hydrogen Absorption in CexGd1-x Alloys: *Joseph Bloch*¹; ¹NRCN

W-60: Impact of the Sequence of Strain Hardening and Precipitation Hardening on Mechanical Properties of Grade 6201 AlMgSi Alloy Wire: *Beata Smyrak*¹; ¹AGH - University of Science and Technology

W-61: Improved Room-Temperature Hydrogen Sensing Characteristics of Nanocrystalline Tin Oxide Through Fabrication of Nanowire Arrays: *Rameech McCormack*¹; Nozomi Shirato²; Amit Kumar¹; Umesh Singh¹; Hyoung Cho¹; Ramki Kalyanaraman²; Sudipta Seal¹; ¹University of Central Florida - MMAE; ²University of Tennessee Knoxville - MMAE

W-62: Industrial Use of a New Ultrasound Spray for Cooling and Wet Gas Treatment in the Pyrometallurgical Processes: *Milorad Cirkovic*¹; Vlastimir TRUJIC¹; Željko KAMBEROVIC¹; ¹Mining and Metallurgy Institute Bor

W-63: Influence of Heat Treatment on the Corrosion of Steels in CCS Environment: Anja Pfenning¹; Sabrina Schulz¹; *Axel Kranzmann*²; Thomas Werlitz¹; Stephan Wetzlich¹; Enrico Bülow¹; Jan Tietböhl¹; Christian Frieslich¹; ¹HTW Berlin; ²BAM

W-64: Influence of Hf on Inhibiting Precipitation in Ni-rich NiTiPdHf Shape Memory Alloys: *Anne Coppa*¹; Ron Noebe²; Glen Bigelow²; Mark Weaver¹; Greg Thompson¹; ¹The University of Alabama; ²NASA Glenn Research Center

W-65: Influence of Process and Thermo-physical Parameters on the Heat Transfer at Electron Beam Melting of Cu and Ta: *Katia Vutova*¹; Veliko Donchev¹; Vania Vassileva¹; Georgi Mladenov¹; ¹Institute of electronics, Bulgarian Academy of Sciences

W-66: Infrared Thermographic Characterization of Tensile Fracture in Railway Steels: *Jeongguk Kim*¹; ¹Korea Railroad Research Institute

W-67: Investigating Strain-Induced Martensitic Transformation in Steel through In-Situ TEM Test: Yong-Jae Kim¹; *In-Chul Choi*¹; Byung-Gil Yoo¹; Takahito Ohmura²; Jae-Il Jang¹; ¹Hanyang University; ²National Institute for Materials Science

W-68: Investigation of the Polymer Composite Materials Reinforced by Hybrid Carbon and Basalt Fibers: *Nikoloz Chikhradze*¹; Guram Abashidze¹; Levan Japaridze¹; ¹Mining Institute/Georgian Technical University

W-69: Laboratory Testing Results of Kinetics And Processing Technology of the Polymetallic Sulphide Concentrate Blagojev Kamen - Serbia: *Milorad Cirkovic*¹; Željko Kamberovic¹; Vlastimir Trujic¹; ¹Mining and Metallurgy Institute Bor

W-70: Manufacturing and Macroscopic Properties of Cold Sprayed Cu-Ga Coating Material for Sputtering Target: *Kee-Ahn Lee*¹; Young-Min Jin¹; Byeong-Cheol Choi¹; Dong-Yong Park²; Hyung-Jun Kim³; ¹Andong National University; ²Tae-Kwang Tech.; ³RIST

W-71: Material Characterization of TRISO Particles Using Nanoindentation: *Jenny Martos*¹; ¹UC Berkeley

W-72: Mechanical Properties of Nanocomposites Based on PA6 Blends: *Pankaj Agrawal*¹; Gustavo Brito¹; Bartira Cunha¹; Shirley Nobrega¹; Edcleide Aratijo¹; Tomás Mélo¹; ¹Federal University of Campina Grande - UFCG

W-73: Mechanical Behavior of Porous NiAl Fabricated by Unidirectional Solidification: *Ji-Woon Lee*¹; Soong-Keun Hyun¹; Mok-Soon Kim¹; Takuya Ide²; Hideo Nakajima²; ¹Inha University; ²Osaka University

W-74: Microstructural Characterization of Aged MAR-M247(Nb) Nickel-Based Superalloy: *Renato Baldan*¹; Carlos Nunes¹; Gilberto Coelho¹; Paulo Ricardo Azevedo Silva¹; ¹USP - University of São Paulo

W-75: Microstructure and Property Modifications in Mould Steels Treated by Pulsed Electron Beam: *Kemin Zhang*¹; ¹Shanghai University of Engineering Science

W-76: Modeling Cyclic Creep Relaxation in Fiber-Reinforced Gasketing Materials: *James Williams*¹; Ali Gordon¹; ¹University of Central Florida

W-77: Modeling of Al/W Granular Porous Composites during Dynamic Deformation: *Karl Olney*¹; Vitali Nesterenko¹; David Benson¹; ¹UCSD

W-78: Morphology of Nanocrystalline ZnO Prepared from Aqueous Solutions: *Eguiberto Galego*¹; Marilene Serna¹; Lalgudi Ramanathan¹; ¹CNEN-IPEN/SP

W-79: Nanocomposite of Platinum Particle by Liquid Chemical Phase Reduction: *Jin Ho Lee*¹; Jin Woo Kim¹; Se Hoon Kim¹; Young Do Kim¹; ¹Hanyang University

W-80: Organic Coatings to Prevent Molten Aluminum Water Explosions in Aluminum Plants: *Alex Lowery*¹; Joe Roberts²; ¹Wise Chem LLC; ²Pyrotek Inc.

W-81: Oxidation Resistances of Al₂Ca Added Al-5Mg Alloy: *Shae K. Kim*¹; Gun-Young Oh¹; Young-Ok Yoon¹; ¹KITECH

W-82: Phase Decomposition in Isothermally-Aged Fe-Cr Alloys: *Victor Lopez-Hirata*¹; Erika Avila-Davila²; Hector Dorantes-Rosales¹; Maribel Saucedo-Muñoz¹; ¹Instituto Politecnico Nacional (ESIQIE); ²Instituto Tecnológico de Pachuca

W-83: Physical Modeling on the Effect of Nozzle Clogging on Mold Flow: *Suzhou Wu*¹; ¹Wuhan University of Science and Technology

W-84: Plasticity and Fracture of Vintage Steel under Varying Stress-States, Strain Rates and Temperatures: *Ruth Hidalgo-Hernandez*¹; Paul Allison¹; Mark Horstemeyer²; Kennan Crane¹; Vince Charito¹; ¹US ARMY Corps of Engineers -ERDC; ²Mississippi State University

W-85: Polaritons in Photonic Crystal at THz Frequency Range: *Umberto Fulco*¹; Eudenilson Albuquerque¹; ¹Universidade Federal do Rio Grande do Norte

W-86: Porosity Characterization of Surrogates for Oxide Nuclear Fuels: A Statistical Analysis of Correlations among Grain Boundary Misorientation, Pore Distribution and Processing Conditions: *Robert McDonald*¹; Karin Rudman¹; ¹Arizona State University

W-87: Potential Fiberboard Material from Cow Manure and Disposable Water Bottle: *Boon-Chai Ng*¹; Marlene Murray¹; Craig Bradfield¹; Roy Pritish¹; ¹Andrews University

W-88: Preparation of Pb Free Solder (Cu–Ag–Sn) Particles by Ultrasonic Spray Pyrolysis and Hydrogen Reduction (USP-HR) Method: Çigdem Toparli¹; Burcak Ebin¹; Sebahattin Gürmen¹; ¹Istanbul Technical University

W-89: Processing and Characterization of NiTi-MAX Phase Composites Prepared by Spark Plasma Sintering: Ankush Kothalkar¹; Liangfa Hu¹; Francesco Schaff¹; Sandip Basu¹; Miladin Radovic¹; Ibrahim Karaman¹; ¹Texas A&M University

W-90: Processing of c-BN Film from B4C Target Using R.F. Magnetron Sputtering: Seungkeun Oh¹; Youngman Kim¹; ¹Chonnam National University

W-91: Reciprocal Space Configurational Kinetics of Amorphous Systems: Volodymyr Bugaev¹; Mariya Rasshchupkyna¹; Alexander Udyansky²; Miguel Castro-Colin¹; Peter Wochner¹; ¹Max Planck Institute for Intelligent Systems; ²Max Planck Institute for Iron Research GmbH

W-92: Refinement of Ligaments of Nanoporous Ag Ribbons by Controlling the Surface Diffusion of Ag: Tingting Song¹; Yulai Gao¹; Zhonghua Zhang²; Qijie Zhai¹; ¹Shanghai University; ²Shandong University

W-93: Relationship between Heat Input and Microstructure and Mechanical Properties of Laser Beam Welded Superalloy Inconel 718: Akin Odabası¹; Necip Ünü²; Gültekin Göller²; M. Niyazi Eruslu²; E. Sabri Kayalı²; ¹Firat University; ²Istanbul Technical University

W-94: Role of Work Hardening during Sliding Wear of Heat Treated 2024 Al Alloy: Yong-Suk Kim¹; Hyuk Woo Kwon¹; Gonam Kim¹; ¹Kookmin University

W-95: Silver Uptake from Dilute Cyanide Solution Using Activated Charcoal: Bihter Zeytuncu¹; Onuralp Yucel¹; ¹Istanbul Technical University

W-96: Structural and Electrical Characteristics of Ba2DyNbO6: Suharto Chjatterjee¹; Koushik Biswas²; Mukul Pastor²; Mukul Pastor²; ¹Ace Calderys Ltd; ²Indian Institute of Technology, Karagpur, India

W-97: Study of Stacking Fault Formation Probability under Loading in High Manganese Steels: Mihyun Kang¹; Wanchuck Woo¹; Vyacheslav Em¹; Yong Kook Lee²; Eunjo Shin¹; Back-Seok Seoung¹; ¹KAERI (Korea Atomic Energy Reserch Institute); ²Yonsei University

W-98: Synergistic Extraction and Solvent Extraction of Uranium from Sulfate Solutions – A Comparative Study: Rajesh Kumar Jyothi¹; Chul-Joo Kim¹; Jin-Young Lee¹; Joon-Soo Kim¹; Ho-Sung Yoon¹; ¹Korea Institute of geoscience and Mineral Resources (KIGAM)

W-99: Synthesis and Characterization of Metallic Oxides: Eduardo Brocchi¹; Rodrigo Souza¹; Marina Doneda²; Jose Campos³; Ana Cristina Wimmer¹; Rogério Navarro¹; ¹PUC-Rio; ²VALE; ³CBPF

W-100: Synthesis and Characterization of Nacre-Inspired Nanocomposites: Omar Rodriguez-Negron¹; Carlos Morales-Del Valle¹; Ruth Hidalgo-Hernandez²; Robert Moser²; Paul Allison²; Mei Chandler²; Charles Weiss²; Philip Malone²; ¹UPRM/ ARMY ERDC; ²US ARMY ERDC

W-101: Synthesis and Electrochemical Performance of LiMnBO3 as a Novel Li-Ion Battery Materials: Hyukjae Lee¹; Yong-Suk Lee¹; ¹Andong National University

W-102: Synthesis of SiC Nanoparticles for Ink-Jet Printing: Jong-Woong Kim¹; Young-Sung Kim²; Sung-Jei Hong¹; Hyun-Min Cho¹; ¹Korea Electronics Technology Institute; ²Seoul National University of Science & Technology

W-103: Synthesis, Characterization and Application of Core-Shell Oxide Nanoparticles: Yuanbing Mao¹; Suresh Alaparthi¹; ¹University of Texas-Pan American

W-104: TEM Study of Crystal Defects in Laves Phase Alloys: Ke Wang¹; Kwo Young²; Leonid Bendersky¹; ¹NIST; ²Energy Conversion Devices

W-105: The Effect of Die-Shape and Die Parameters in ECAP on the Microstructure and Flow Properties of Some 2-Phase Alloys: Nithyanand Prabhu¹; B Kashyap¹; P Hodgson²; Rahul Kulkarni¹; Pabitra Palai³; V Srinivas⁴; ¹Indian Institute of Technology Bombay; ²Deakin University; ³Tata Steel; ⁴Vizag Steel Plant

W-106: The Effect of High Superheat on the Solidification Structure and Carbon Segregation of Ferrite-Based Alloy: Honggang Zhong¹; Yi Tan¹; Huigai Li¹; Xiping Mao²; Qijie Zhai¹; ¹Shanghai University; ²Guangzhou Zhujiang Iron and Steel Co., Ltd.

W-107: The Effect of Oxygen Vacancies on the Stability and Reactivity on Rutile TiO2 (110) and Its Reconstructions: Jackelyn Martinez¹; Tzu-Ray Shan¹; Susan Sinnott¹; Simon Phillipot¹; ¹University of Florida

W-108: The Formation and Characterization of Al Metal Matrix Composite Reinforced by Ni60Nb20Zr20 Amorphous Powders: Pee-Yew Lee¹; ¹National Taiwan Ocean University

W-109: The Formation of an Eutectic Mixture for Predicting the Ideal Solubility of Thermally Stable and Unstable Compounds: Rodolfo Pinal¹; Ryan McCain¹; ¹Purdue University

W-110: The Importance Role of Sulfur in Autogenous Copper Smelting Technology: Ljubisa Mistic¹; Vlastimir Trujic¹; Tatjana Trujic¹; ¹Mining and Metallurgy Institute

W-111: The Solid-State Sn/Ni Interfacial Reaction Under Three-Point Bending: Chih-Ming Chen¹; Wen-Kai Liao¹; ¹National Chung Hsing University

W-112: The Study of Thermal Properties and Devitrification Behaviors of Al-RE-TM Amorphous System: Song-Yi Kim¹; Gwang-Yeob Lee¹; Min-Ha Lee¹; ¹Kitech

W-113: The Variability of Small Crack Growth in Notched Bars of IN100: D'Anthony Ward¹; Andrew Rosenberger²; Dennis Buchanan³; ¹University of Dayton ; ²Air Force Research Laboratory; ³University of Dayton Research Institute

W-114: Thermal Analysis of the Composition of Poly(Acrylic Acid)/Carboxymethylstarch Used as a Polymeric Binder: Beata Grabowska¹; Mariusz Holtzer¹; Sonja Eichholz²; Krzysztof Hodor²; Ewa Olejnik¹; ¹AGH University of Science and Technology; ²Applications Laboratory Thermal Analysis, NETZSCH-Gerätebau GmbH

W-115: Thermal Radiation Spectra in Photonic Crystals: Luciano da Silva¹; Manoel Vasconcelos¹; ¹Universidade Federal do Rio Grande do Norte

W-116: Thermographic Defects Evaluation of Railway Bogies: Jeongguk Kim¹; ¹Korea Railroad Research Institute

W-117: Thermographic Monitoring of Braking in Railway Brake Shoe: Jeongguk Kim¹; Sung-Cheol Yoon¹; ¹Korea Railroad Research Institute

W-118: Titania Based One-Dimensional Nanomaterials for Lithium Ion Batteries: Hyukjae Lee¹; Young-Jun Kim²; Jong-Hwan Park¹; ¹Andong National University; ²Korea Electronics Technology Institute

W-119: Toxic Metals in Ash Residue from Electronic Waste Dismantling and Incineration Practices: Kathleen Hibbert¹; Oladele Ogunseitan¹; ¹University of California, Irvine



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W-120: Wettability and Interfacial Microstructure of Pb-Free Sn_{3.5}Ag Alloy Powders on Cu Substrate: *Jin Zhao*¹; Weipeng Zhang²; Tingting Song²; Yulai Gao²; Qijie Zhai²; ¹Shanghai university; ²Shanghai University

Biological Materials Science Student Poster Contest: Poster Session

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division, TMS: Biomaterials Committee
Program Organizers: Nima Rahbar, University of Massachusetts Dartmouth; Candan Tamerler, Istanbul Technical University; Po-Yu Chen, National Tsing Hua University; Molly Gentleman, Texas A&M University

Monday PM
March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

I-1: Addition of Apatite Microparticle to Cell Cultures- Effects on Differentiation: *Amanda Farley*¹; Laura Datko¹; Marian Kennedy²; Delphine Dean¹; ¹Clemson Bioengineering; ²Clemson Materials Science and Engineering

I-2: Adhesion and Interfacial Fracture Toughness between Hard and Soft Materials: *Nima Rahbar*¹; Sina Youssefian¹; ¹Umass Dartmouth

I-3: Cellulose-based Nanocomposite as a Potential Scaffold in Cardiovascular Tissue Engineering: *Parisa Pooyan*¹; Rina Tannenbaum¹; Hamid Garmestani¹; ¹Georgia Institute of Technology

I-4: Comparison of Composites with Biological or Synthetic Hydroxyapatite Scaffolds: *Steve Lee*¹; Ekaterina Novitskaya¹; Antoni Tomsia²; Po-Yu Chen³; Joanna McKittrick¹; ¹University of California, San Diego; ²Lawrence Berkeley National Laboratory; ³National Tsing Hua University

I-5: Effects of Heat Treatment and Moisture on Mechanical Properties of Bamboo: *Peter Kotowski*¹; Nima Rahbar¹; ¹Umass Dartmouth

I-6: In Vitro Restoration of Tooth Root via Protein-Derived Mineralization Peptides: *Mustafa Gungormus*¹; Ersin Oren¹; Hanson Fong¹; Jeremy Horst¹; Malcolm Snead²; Ram Samudrala¹; Martha Somerman¹; Candan Tamerler¹; Mehmet Sarikaya¹; ¹University of Washington; ²University of Southern California

I-7: Kinetics of Phosphate Ion Cerium Oxide Nanoparticle Interaction and Effect on Redox Activity of Bare and Functionalized Cerium Oxide Nanoparticles: *David Letter*¹; Amit Kumar¹; Vanessa Moosavifazel¹; Soumen Das¹; William Self¹; Sudipta Seal¹; ¹AMPAC

I-8: Nanotechnology For Drug Formulation: Improving Solubility of Insoluble Drugs: *Aeriel Murphy*¹; Dennis Leung²; ¹University of Alabama; ²Merck Sharp & Dohme Corporation Inc.

I-9: Molecular Modeling of Adhesion Between Hydrogels and Polyurethane Fibers: *Hossein Salahshoor*¹; Nima Rahbar¹; ¹University of Massachusetts Dartmouth

I-10: Cortical Bone Fractures Initiate at Fatigue Microcracks Located Near Elevated Intracortical Porosity but not Elevated Mineralization: *Travis Turnbull*¹; Ryan Roeder¹; ¹University of Notre Dame

EMPMD 2012 Technical Division Student Poster Contest

Sponsored by: The Minerals, Metals and Materials Society, TMS Electronic, Magnetic, and Photonic Materials Division

Monday PM
March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

SP-1: Vertically Aligned Carbon Nanotubes as Active Electrodes for Metal Substrate Supercapacitors: *Radu Reit*¹; Justin Nguyen¹; William Ready¹; ¹Georgia Tech Research Institute

SP-2: Controlling Phase Evolution in Thin Film PZT by Switching pO₂ during Crystallization: *Patrick Wanninkhof*¹; Sung Wook Min¹; Jacob Jones¹; ¹University of Florida

SP-3: Correlation between Multi-scale Microstructure and Creep Properties of Micron Scale Coarse Grained Solder Interconnects: *Subhasis Mukherjee*¹; ¹University of Maryland, College Park

SP-4: Effect of Doped Atom Magnetism On electronic Transport through C₅₉X and

C₆₉X(X = B and N) Molecular Junctions: *Hamidreza Vanaie*¹; Mojtaba Yaghobi²; Zahra Sedaghat³; ¹Islamic Azad University ; ²Islamic Azad University; ³Tehran University of Medical Sciences

SP-5: Fabrication and Design of a Thin Film Triode Type Carbon Nanotube Field Emitter as an Electron Source: *Graham Sanborn*¹; Jud Ready¹; Stephan Turano¹; ¹GT

SP-6: Improving Charge Transfer Characteristic of Graphene for Triiodide Reduction in Dye-Sensitized Solar Cells: *Santanu Das*¹; P Sudhagar²; Ved Verma¹; Dong Hoon Song²; Eisuke Ito³; S. Y. LEE³; Yong Soo Kang²; Wonbong Choi¹; ¹Florida International University; ²Hanyang University; ³RIKEN-ASI

SP-7: Mechanical Behavior of DGEBA-DAPSONE Epoxy Networks from Molecular Dynamics Simulations: *Abhishek Kumar*¹; Veera Sundararaghavan¹; ¹Aerospace Department

SP-8: Nanotechnology and Its Applications: *Abhijeet Gaikwad*¹; ¹JBIMS

SP-9: New Numerical Method to Calculate the True Optical Absorption of Hydrogenated Nanocrystalline Silicon Thin Films and Solar Cells: *Fatiha Besahraoui*¹; ¹Oran University

SP-10: Surface Morphology and Phase Distribution of Zn and Zn-Co Alloy Coatings, Obtained by Direct Current: *Meysam Heydari Gharahcheshmeh*¹; Ahmed Touhami²; ¹University of Texas at Brownsville ; ²University of Texas at Brownsville

SP-11: The Temperature and Excitation Intensity Effects on the Photoluminescence Spectra of InAs/InP Quantum Dots: *Fatiha Besahraoui*¹; ¹Oran University

SP-12: Towards Ultra-thick Battery Electrodes: Aligned Carbon Nanotube - Enabled Architecture: *Kara Evanoff*¹; Javed Khan²; Alexander Balandin²; Alexandre Magasinski¹; W. Jud Ready¹; Thomas Fuller¹; Gleb Yushin¹; ¹Georgia Institute of Technology; ²University of California

SP-13: Applying Taguchi Method for Optimization of Pulsed TIG Welding Process Parameters of AZ31 Magnesium Alloy Weldments: *Alireza Amirkhani*¹; Alireza Ebrahimi²; Rasool Azari Khosroshahi²; ¹Tekin Joosh Asia Company; ²Sahand University of Technology

EPD 2012 Technical Division Student Poster Contest

Sponsored by: The Minerals, Metals and Materials Society, TMS, TMS Extraction and Processing Division

Monday PM
March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

SP-14: Aluminum-zinc Dealloying: A Comparative Analysis of Processing Methods for Porous Metals: *Rafael Soler-Crespo*¹; Elvin

Estremera¹; Ulises Barajas-Valdes¹; Amarilis Decllet¹; Oscar Suarez¹; Arturo Hernandez-Maldonado¹; ¹University of Puerto Rico - Mayaguez

SP-15: Delaminating and Recycling of Printed Circuit Boards using Supercritical Carbon Dioxide: *Mariela Robledo¹*; ¹Arizona State University

SP-16: A Novel Synthesis Method for Titanium Dioxide Pigment – Eliminating Direct CO₂ Emissions: *Scott Middlemas¹*; *Z. Zak Fang¹*; *Peng Fan¹*; ¹University of Utah

SP-17: Dielectric and Magnetic Losses of Iron Oxides in Microwave Ironmaking: *Zhiwei Peng¹*; ¹Michigan Technological University

SP-18: Dimethyl Sulfoxide: An Alternative to NMP for Electrochemical Performance of Cathode Active Materials in Lithium Ion Battery: *Oluwatosin Bankole¹*; *Lixu Lei¹*; ¹Southeast University,

SP-19: Electrochemistry of Enargite: Reactivity in Alkaline Solutions: *Robert Gow¹*; *Courtney Young¹*; *Hsin Huang¹*; *Greg Hope²*; *Yasushi Takasaki³*; ¹Montana Tech; ²Griffith University; ³Akita University

LMD 2012 Technical Division Student Poster Contest

Sponsored by: The Minerals, Metals and Materials Society, TMS Light Metals Division

Monday PM
March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

SP-20: Feasibility Study of the Fabrication of a Niobium Diboride/Aluminum Composite: *Jose Moreno Quiles¹*; *Neshma Lopez¹*; ¹University of Puerto Rico - Mayaguez

SP-21: Mechanical Behavior of Cast Mg AZ31-B Alloy Produced by Magnetic Suspension Melting Process: *Paige Boehmcke¹*; *Nagy El-Kaddah¹*; *Ariel Murphy¹*; ¹Univ of Alabama

SP-22: Effect of Precipitates on Shear Banding during Deformation of Mg Alloys: *Frank Sapienza¹*; *Zachary Bryan¹*; *Michele Manuel¹*; ¹UF

SP-23: The Effect of Scandium Additions on the Degradation Behavior of Magnesium in Simulated Body Fluid: *Nancy Nguyen¹*; *Harpreet Brar¹*; *Michele Manuel¹*; ¹University of Florida

SP-24: Evaluation of the Mechanical Response of a Bcc Mg-Li-Al/C Composite: *Ryan Hooper¹*; *Zachary Bryan¹*; *Michele Manuel¹*; ¹University of Florida

SP-25: Experiments and Modeling of Low-Cycle Fatigue of Extruded 6061 Aluminum Alloy: *Andrew Brammer¹*; *J Jordan¹*; ¹The University of Alabama

SP-26: Application of Computational Thermodynamics and Precipitation Kinetics to Light Weight Al Alloy Design: *Danielle Belsito¹*; *Richard Sisson¹*; ¹Worcester Polytechnic Institute

SP-27: A Study of Biodegradable Mg-Ca-Sr Alloys: *Ida Berglund¹*; *Harpreet Brar¹*; *Malisa Sarntinoranont¹*; *Benjamin Keselowsky¹*; *Michele Manuel¹*; ¹University of Florida

SP-28: New Numerical Method to Calculate the True Optical Absorption of Hydrogenated Nanocrystalline Silicon Thin Films and Solar Cells: *Fatiha Besahraoui¹*; ¹Oran University

SP-29: Oxidation Behavior of Zr₅₆Al₁₆Co₂₈ Metallic Glasses: *Wenhuan Cao¹*; *Jiliang Zhang¹*; *Chan Hung Shek¹*; ¹City University of Hong Kong

SP-30: Sensitivity Analysis of Crack Initiation Life of a 2-grain Model of Ti-6Al-4V: *Daniel Sparkman¹*; *Harry Millwater¹*; *Somnath Ghosh²*;

¹University of Texas at San Antonio; ²John Hopkins University

SP-31: Effects of Pulsed Magnetic Annealing on the Grain Boundary of Primary Recrystallized Microstructure in the Grain-Oriented Silicon Steel: *Junjun Huang¹*; *Lihua Liu¹*; *Xin Xia¹*; *Xiang Jiang¹*; *Lijuan Li¹*; *Qijie Zhai¹*; ¹Shanghai University

SP-32: The Role of Solute Nature on the Deformation Behavior and Texture Evolution in Magnesium Alloys: *Zachary Bryan¹*; *Ryan Hooper¹*; *Michele Manuel¹*; ¹University of Florida

SP-33: The Temperature and Excitation Intensity Effects on the Photoluminescence Spectra of InAs/InP Quantum Dots: *Fatiha Besahraoui¹*; ¹Oran University

SP-34: X-Ray Radiography of Magnesium MMCs Processed by Electromagnetic Acoustic Transduction: *Hunter Henderson¹*; *Zachary Bryan¹*; *Orlando Rios²*; *Alexander Melin²*; *Gail Ludtka²*; *George Lopp¹*; *Yu-Min Su¹*; *Michele Manuel¹*; ¹University of Florida; ²Oak Ridge National Laboratory

MPMD 2012 Technical Division Student Poster Contest

Sponsored by: The Minerals, Metals and Materials Society, TMS Materials Processing and Manufacturing Division

Monday PM
March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

SP-35: Novel Three-Dimensional Printing Technology for Advanced Modeling and Casting of A356 Impeller: *Blake Whitley¹*; ¹The University of Alabama

SP-36: Processing of Aluminum Wires and Its Effect on Their Electrical Properties: *Grace Rodriguez¹*; ¹University of Puerto Rico

SP-37: Frequency and Temperature Dependent Dynamic Mechanical Properties of Metal Matrix – Barium Titanate Composites: *Jack Tilka¹*; *Zachary Bryan¹*; *Jacob Jones¹*; *Michele Manuel¹*; ¹University of Florida

SP-38: Novel Manufacturing Processes for Ultra-fine Grained Microstructure in 9310 Steel: *Thomas Kozmel¹*; ¹Illinois Institute of Technology

SP-39: Automatic Combination of Multi-tile EBSD Datasets: *Adam Shiveley¹*; *Adam Pilchak²*; *Paul Shade²*; *Jay Tiley²*; *Donna Ballard²*; ¹Southwestern Ohio Council for Higher Education; ²United States Air Force

SP-40: Electro-Chemical Mechanical Polishing (ECMP) For Electron Microscopy: *Kevin Shiveley II¹*; *Jay Tiley²*; *Adam Shiveley³*; *Gopel Viswanathan⁴*; *Christopher Crouse⁴*; ¹Universal Technology Corporation; ²United States Air Force; ³Southwestern Ohio Council for Higher Education; ⁴Universal Energy Systems

SP-41: Synthesis and Characterization of Nacre-inspired Nanocomposites: *Omar Rodriguez-Negron¹*; *Carlos Morales-del Valle²*; *Ruth Hidalgo-Hernandez³*; *Paul Allison³*; *Robert Moser³*; *Mei Chandler³*; *Charles Weiss³*; *Phillip Malone³*; ¹UPRM/ ARMY ERDC; ²UPRM; ³ARMY ERDC

SP-42: Synthesis and Properties of Bulk Graphene NanoPlatelets Consolidated by Spark Plasma Sintering: *Andy Nieto¹*; ¹Florida International University



TMS 2012

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SMD 2012 Technical Division Student Poster Contest

Sponsored by: The Minerals, Metals and Materials Society, TMS Structural Materials Division

Monday PM
March 12, 2012

Room: Atlantic Hall
Location: Dolphin Resort

SP-43: Characterization and Quantification of X65, X80, and X100 Pipeline Steels for Statistical Microstructural Analysis: *Elisa Duesing*¹; Elizabeth Rust²; Brian Welk¹; Dan Huber¹; John Sosa¹; Hamish Fraser¹; ¹Center for the Accelerated Maturation of Materials; ²The Ohio State University

SP-44: Analysis of Hafnium Addition Effects to Microstructural and Mechanical Properties in the Nickel-Titanium-Hafnium System for Shape-Memory Optimization: *Blake Whitley*¹; ¹The University of Alabama

SP-45: Design of pH and Thermal Sensitive Hydrogels for Catheter Based Minimally Invasive Heart Surgery: *Min Zhang*¹; James Bush¹; Travis Busbee¹; Zhenqing Li¹; Jianjun Guan¹; ¹Ohio State Univ

SP-46: Serial Sectioning and 3D Reconstruction of Grains to Obtain Metric and Topological Properties: *Amy Adams*¹; David Rule¹; Veena Tikare¹; Burton Patterson¹; Robert DeHoff¹; ¹University of Florida

SP-47: Atomistic Prediction of Precipitate Strengthening in Nanoscale Metallic Multilayers: *Niaz Abdolrahim*¹; Ioannis Mastorakos¹; Hussein Zbib¹; ¹washington state university

SP-48: A Review of First-Principles Investigations of Iron Based Alloys Using DFT: *Krista Kalac*¹; Julia Medvedeva¹; ¹Missouri S&T

SP-49: Characterization of Transformation Toughening in Shape Memory Alloy Reinforced Composites: *Fatmata Barrie*¹; Michele Manuel¹; ¹University of Florida

SP-50: Creep Deformation Mechanisms in Grade 91 Steel: *Triratna Shrestha*¹; Indrajit Charit¹; Mehdi Basirat¹; Gabriel Potirniche¹; Karl Rink¹; ¹University of Idaho

SP-51: Crystal Structure and Disorder of Refractory High-Entropy Alloys: *Soumyadipita Maiti*¹; Walter Steurer²; ¹ETH Zurich ; ²ETH Zurich

SP-52: Design of Aluminum-Based Metal Matrix Composite with Self-Healing Capabilities: *Charles Fisher*¹; Michele Manuel¹; ¹University of Florida

SP-53: Analysis of Serrated Flow in Ni-10Pd during High Temperature Instrumented Microindentation: *Bin Gan*¹; Sammy Tin¹; ¹Illinois Institute of Technology

SP-54: High Temperature Deformation of Ti-Al-Nb-Cr-Mo Alloys: *Glenn Bean*¹; Fereshteh Ebrahimi¹; Hans Seifert²; Michele Manuel¹; ¹University of Florida; ²Karlsruhe Institute of Technology

SP-55: Influence of Austenite Stability on Steel Low Cycle Fatigue Response: *Greg Lehnhoff*¹; Kip Findley¹; ¹Colorado School of Mines

SP-56: Mechanical Characterization of Hierarchical Biological Structures: *Rogie Rodriguez*²; Wayne Hodo²; Paul Allison²; Mei Chandler²; Jen Seiter²; Aimee Poda²; Mark Chappell²; Brandon Lafferty²; ¹UPRM/US Army ERDC; ²US ARMY ERDC

SP-57: New Numerical Method to Calculate the True Optical Absorption of Hydrogenated Nanocrystalline Silicon Thin Films and Solar Cells: *Fatiha Besahraoui*¹; ¹Oran University

SP-58: Recycling of the Alloy AZ91D Departing from Scrap in the Shape of Shavings Contaminated with Mineral Oil: Roberto Lucci¹; Roger López Padilla¹; ¹Universidad Tecnológica Nacional Facultad Regional Córdoba

SP-59: Rheological Performance and Compressive Strength of Superplasticized Mortar Cements with SiO₂ Nanoparticles Additions: *Luis Zapata*¹; Genock Portela¹; O. Marcelo Suárez¹; Orlando Carrasquillo²; ¹University of Puerto Rico, Mayagüez; ²US Army Corps of Engineers

SP-60: Atom Probe Tomography of Simulated Fission Product Segregation in CeO₂: *Billy Valderrama*¹; Hunter Henderson¹; In-Wook Park²; Jianling Lin²; John Moore²; Clarissa Yablinsky³; Todd Allen³; Michele Manuel¹; ¹University of Florida; ²Colorado School of Mines; ³Univeristy of Wisconsin-Madison

SP-61: The Development of Nanostructured In₂O₃ Oxide by Electron Stimulated Oxidation on InP and InSb Surfaces: *Fatiha Besahraoui*¹; ¹Oran University

SP-62: The Temperature and Excitation Intensity Effects on the Photoluminescence Spectra of InAs/InP Quantum Dots: *Fatiha Besahraoui*¹; ¹Oran University

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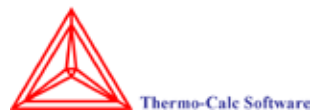
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