

TMS 2016

145th Annual Meeting & Exhibition

**FEBRUARY 14-18 DOWNTOWN NASHVILLE,
TENNESSEE MUSIC CITY CENTER**

Connecting the Global Minerals, Metals, and Materials Community.

FINAL 
PROGRAM



**FOR MAPS
& FLOORPLANS**

See Page 2.



**AMERICAN
ELEMENTS**

THE MATERIALS SCIENCE MANUFACTURER®

catalog: americanelements.com

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|--|---|---|--|--|---|---|---|---|---------------------------------------|--|---|---|--|--|---|---------------------------------------|--------------------------------------|---|---|--|--|---|--|---|--|---|--|
| 1 H 1.00794 Hydrogen | | | | | | | | | | | | | | | | | 2 He 4.002602 Helium | | | | | | | | | | | | | | |
| 3 Li 6.941 Lithium | 4 Be 9.012182 Beryllium | | | | | | | | | | | | | | | | | 10 Ne 20.1797 Neon | | | | | | | | | | | | | |
| 11 Na 22.98976928 Sodium | 12 Mg 24.305 Magnesium | | | | | | | | | | | | | | | | | 18 Ar 39.948 Argon | | | | | | | | | | | | | |
| 19 K 39.0983 Potassium | 20 Ca 40.078 Calcium | 21 Sc 44.955912 Scandium | 22 Ti 47.867 Titanium | 23 V 50.9415 Vanadium | 24 Cr 51.9961 Chromium | 25 Mn 54.938045 Manganese | 26 Fe 55.845 Iron | 27 Co 58.933195 Cobalt | 28 Ni 58.6934 Nickel | 29 Cu 63.546 Copper | 30 Zn 65.38 Zinc | 31 Ga 69.723 Gallium | 32 Ge 72.64 Germanium | 33 As 74.9216 Arsenic | 34 Se 78.96 Selenium | 35 Br 79.904 Bromine | 36 Kr 83.798 Krypton | | | | | | | | | | | | | | |
| 37 Rb 85.4678 Rubidium | 38 Sr 87.62 Strontium | 39 Y 88.90585 Yttrium | 40 Zr 91.224 Zirconium | 41 Nb 92.90638 Niobium | 42 Mo 95.96 Molybdenum | 43 Tc (98.0) Technetium | 44 Ru 101.07 Ruthenium | 45 Rh 102.9055 Rhodium | 46 Pd 106.42 Palladium | 47 Ag 107.8662 Silver | 48 Cd 112.411 Cadmium | 49 In 114.818 Indium | 50 Sn 118.71 Tin | 51 Sb 121.76 Antimony | 52 Te 127.6 Tellurium | 53 I 126.90447 Iodine | 54 Xe 131.293 Xenon | | | | | | | | | | | | | | |
| 55 Cs 132.9054 Cesium | 56 Ba 137.327 Barium | 57 La 138.90547 Lanthanum | 58 Ce 140.12 Cerium | 59 Pr 140.90765 Praseodymium | 60 Nd 144.242 Neodymium | 61 Pm (145) Promethium | 62 Sm 150.36 Samarium | 63 Eu 151.964 Europium | 64 Gd 157.25 Gadolinium | 65 Tb 158.92535 Terbium | 66 Dy 162.5 Dysprosium | 67 Ho 164.93032 Holmium | 68 Er 167.259 Erbium | 69 Tm 168.93421 Thulium | 70 Yb 173.054 Ytterbium | 71 Lu 174.967 Lutetium | 72 Hf 178.48 Hafnium | 73 Ta 180.948 Tantalum | 74 W 183.84 Tungsten | 75 Re 186.207 Rhenium | 76 Os 190.23 Osmium | 77 Ir 192.217 Iridium | 78 Pt 195.084 Platinum | 79 Au 196.966569 Gold | 80 Hg 200.59 Mercury | 81 Tl 204.3833 Thallium | 82 Pb 207.2 Lead | 83 Bi 208.9804 Bismuth | 84 Po (209) Polonium | 85 At (210) Astatine | 86 Rn (222) Radon |
| 87 Fr (223) Francium | 88 Ra (226) Radium | 89 Ac (227) Actinium | 90 Th 232.03806 Thorium | 91 Pa 231.03688 Protactinium | 92 U 238.02891 Uranium | 93 Np (237) Neptunium | 94 Pu (244) Plutonium | 95 Am (243) Americium | 96 Cm (247) Curium | 97 Bk (247) Berkelium | 98 Cf (251) Californium | 99 Es (252) Einsteinium | 100 Fm (257) Fermium | 101 Md (258) Mendelevium | 102 No (259) Nobelium | 103 Lr (262) Lawrencium | 104 Rf (261) Rutherfordium | 105 Db (262) Dubnium | 106 Sg (266) Seaborgium | 107 Bh (264) Bohrium | 108 Hs (277) Hassium | 109 Mt (268) Meitnerium | 110 Ds (281) Darmstadtium | 111 Rg (289) Roentgenium | 112 Cn (285) Copernicium | 113 Uut (284) Ununtrium | 114 Fl (289) Flerovium | 115 Uup (288) Ununpentium | 116 Lv (293) Livermorium | 117 Uus (294) Ununseptium | 118 Uuo (294) Ununoctium |

Now Invent.™



Experience the Next Generation of Material Science Catalogs

On January 8, 2016, americanelements.com relaunched. Now with over 10,000 research papers in a new searchable Research Center. Printable GHS-compliant Safety Data Sheets. Thousands of new products. And much more. All on a new secure multi-language "Mobile Responsive" platform.

Now Invent...Reinvented!

PRESIDENT'S WELCOME MESSAGE



DEAR FRIENDS AND COLLEAGUES,

Welcome to the 145th installment of the TMS Annual Meeting & Exhibition! We are pleased to have so many of our colleagues from around the world gathered in one place for this important week of technical exchange, professional growth, and networking.

TECHNICAL EXCHANGE

Over the next several days, you'll have ample opportunity to learn about the latest developments in your field and related fields. I encourage you to take in as much as you can, but, with nearly 3,300 presentations to choose from, you may want to take advantage of the scheduling tools available through the **TMS2016 Mobile App** or the **TMS Personal Conference Scheduler**. (See page 9 for more information on how to use these tools.) A full listing of

technical program offerings begins on page 61.

NETWORKING

Don't be content to merely listen to presentations, however. Be sure to engage in frequent conversations with your fellow attendees—the kind of face-to-face interaction you can only find at a meeting like TMS2016. A number of designated networking receptions and events are planned throughout the week to facilitate these more casual interactions, starting with the Opening Celebration for all attendees on Sunday night. You can view a complete list of networking and social events beginning on page 30.

GLOBAL SHOWCASE

Make sure you carve out adequate time in your schedule to visit the **TMS2016 Exhibit Hall**, an international showcase of products, services, and publications from companies specializing in minerals, metals, and materials. The exhibit celebrates its 30th anniversary in 2016. Come and see what's been bringing companies back for 30 years.

GET INVOLVED

If you want to take the next step in your relationship with TMS—and become one of the volunteers who shapes the programming, publications, and activities of this society—attend one of the **TMS technical committee meetings** being held this week. Dates, times, and locations for these meetings can be found in the Calendar of Events beginning on page 11. We will also be holding a special session this year called **TMS 101: Fundamentals of TMS**. This half-hour presentation on Sunday evening offers an excellent introduction to the society and the opportunities available to you if you want to become more involved. Learn more about this session on page 19.

In short, make the most of this week with your colleagues. We are so glad you've joined us here in Music City!

Sincerely,

A stylized, handwritten signature in blue ink.

Patrice E.A. Turchi
2015 TMS President

MUSIC CITY CENTER

Level I



MUSIC CITY CENTER

Level 2



MUSIC CITY CENTER

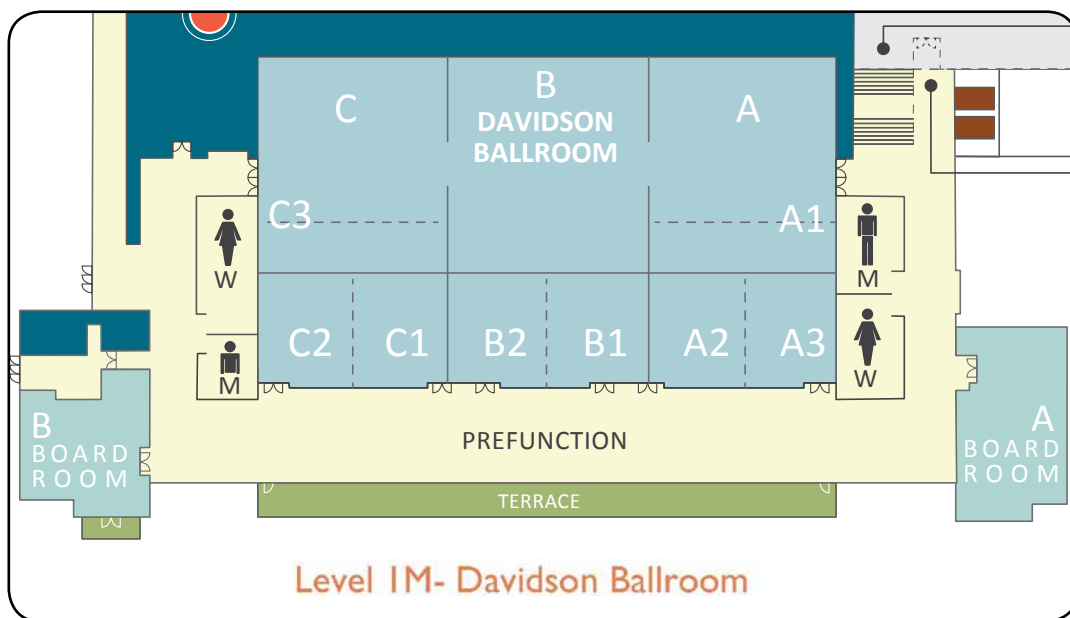
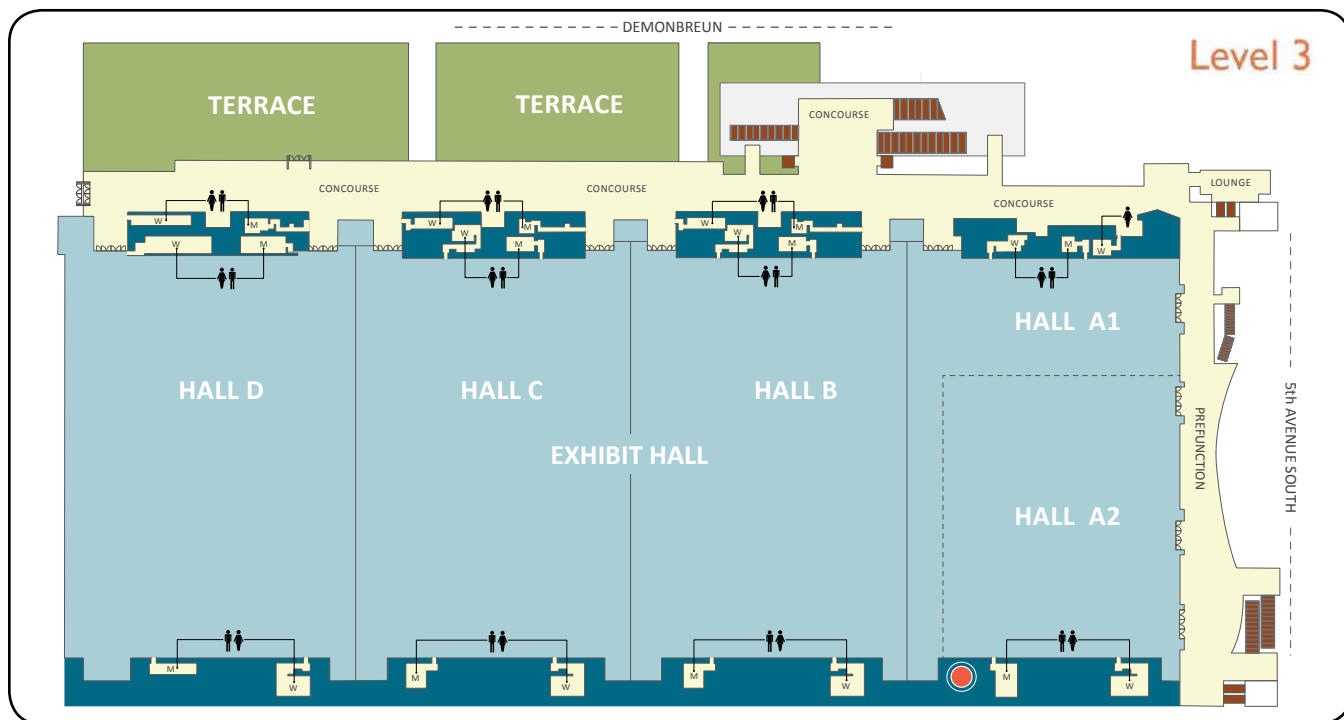
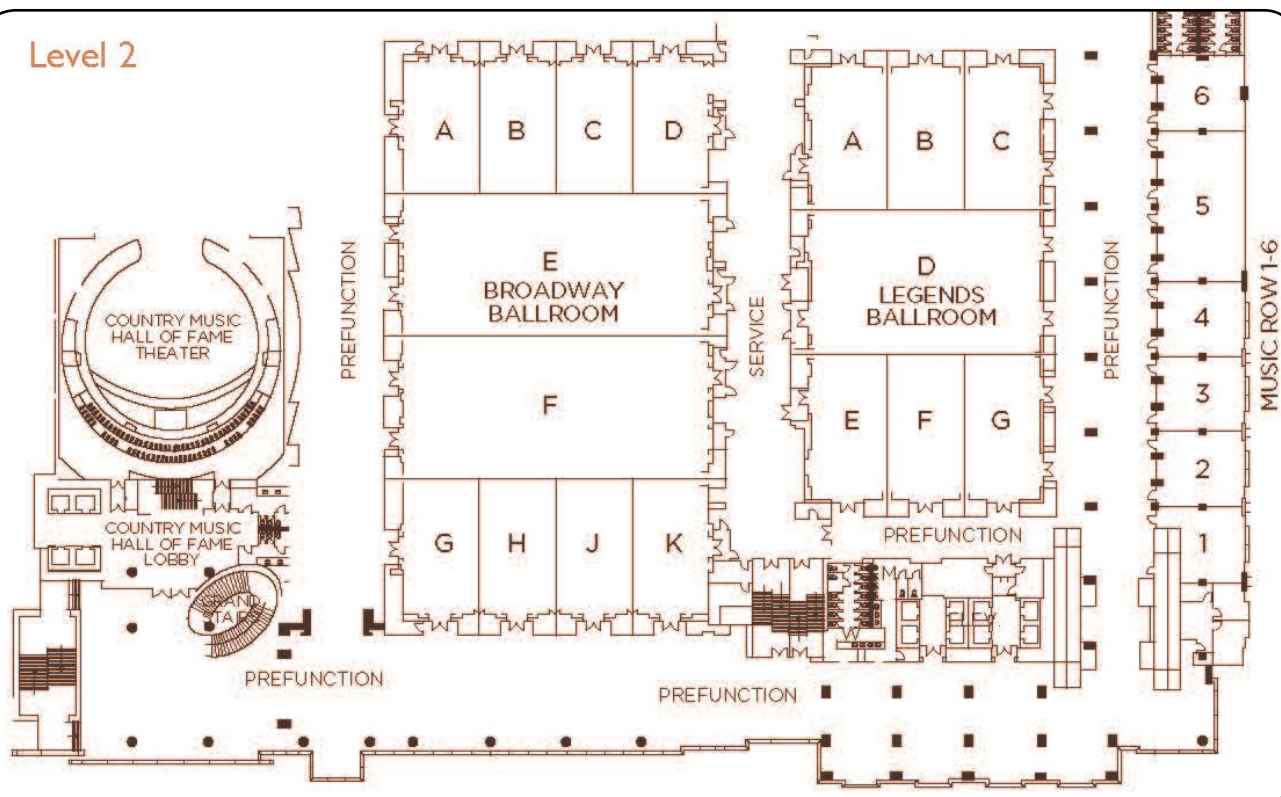


EXHIBIT FLOORPLAN

See Page 43.

OMNI NASHVILLE HOTEL

Level 2



Level 3

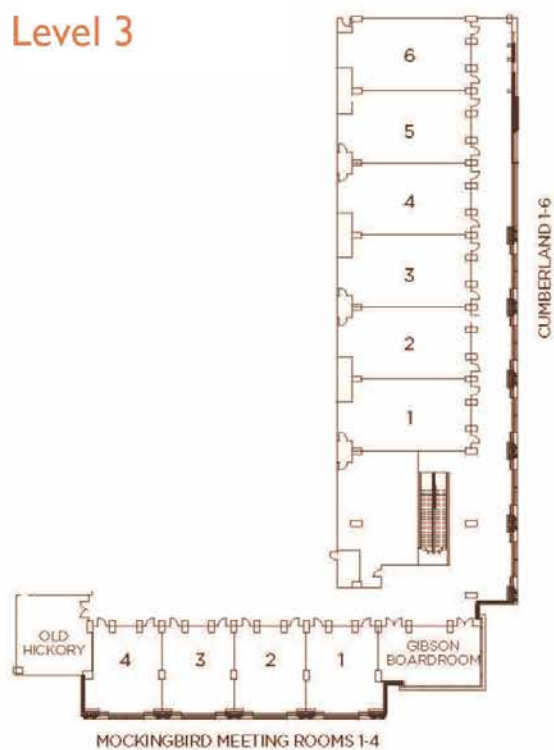


TABLE OF CONTENTS

| | | | |
|---|----|---|-----|
| Maps & Floor Plans | 2 | 2016 TMS-AIME Awards Ceremony & Banquet . . . | 32 |
| Registration & Meeting Logistics | 7 | TMS Volunteer Leadership | 37 |
| Meeting Policies | 10 | Proceedings | 38 |
| Calendar of Events | | Exhibit Directory | 41 |
| Saturday | 11 | Thanks to Our Sponsors | 60 |
| Sunday | 11 | Technical Program | |
| Monday | 13 | Program At-A-Glance | 62 |
| Tuesday | 14 | Monday | 78 |
| Wednesday | 16 | Tuesday | 122 |
| Thursday | 16 | Wednesday | 167 |
| Featured Sessions | 19 | Thursday | 211 |
| Honorary Symposia | 24 | Posters | 231 |
| Special Lectures | 25 | Index | 257 |
| Networking, Student & Social Events | 30 | | |

Broad Base. Best Solutions.



Improved profitability for each electrolytic cell

SGL LANCELOT® for in-situ profile measurements

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

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



Cathodes
SGL CARBON GmbH
www.sglgroup.com/cathodes



For further details please contact
lancelot@sglgroup.com

® registered trademarks of SGL CARBON SE. Patent pending



REGISTRATION

Your full-meeting registration badge provides you access to:

- All technical sessions
- A three-day pass to the TMS2016 Exhibition
- TMS Opening Celebration
- President's Welcoming Reception and Happy Hour Reception (located in the Exhibit Hall)
- Lunch in the Exhibit Hall on Wednesday
- Admission to the awards ceremony portion of the 2016 TMS—AIME Awards Banquet
- General Poster Sessions and Receptions
- TMS Materials Bowl Competition
- Technical Division Student Poster displays
- Admission to select social and networking events
- Online access to the complete collected proceedings of TMS2016

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



TICKETS FOR EVENTS


Certain receptions, luncheons, and other activities at TMS2016 require attendees to purchase a ticket in order to attend. If you purchased tickets in advance for one of these events, your ticket will be attached to your name badge. If you would like to add a ticketed event to your registration, please inquire at the registration area.

DOWNLOAD

THE TMS2016 MOBILE APPLICATION

(See Page 9 for details.)





NAVIGATING THE CONVENTION CENTER AND THE OMNI HOTEL

One of the best ways to keep your bearings during your time in Nashville is to download two apps:

- 1) **The TMS2016 Mobile Application.** The TMS2016 App will help you keep maps of the conference facilities and a schedule of your selected events in your pocket at all times. Search "TMS Annual Meeting" on the App Store or the Google Play™ Store to download.
- 2) **Music City Center Mobile Application.** This app is a detailed directional guide for getting around the convention center using your current location in the building (or, if location services are not enabled on your device, you can type in your location). Search "Music City Center" on the App Store or the Google Play™ Store to download.

Maps of the Music City Center and the Omni Nashville Hotel are also printed in this program beginning on page 4.

NAVIGATING DOWNTOWN NASHVILLE

The Music City Circuit—Nashville's clean diesel hybrid downtown bus system—is free for visitors to ride. The Green Circuit takes you between the Gulch and Riverfront Park. The Blue Circuit runs south to north serving key destinations in downtown Music City. For circuit maps and schedule, visit <http://nashvillemta.org/Nashville-MTA-Music-City-Circuit.asp>

NOTE ABOUT TIME

All times printed in this program refer to Central Standard Time.

NOTICE REGARDING TECHNICAL PROGRAM CANCELLATIONS

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

REGISTRATION & MEETING LOGISTICS

INTERNET ACCESS

The Music City Center offers free wireless internet in all public areas. No login or password is needed for access.

CHARGING STATIONS

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

BUSINESS CENTER—UPS STORE #6425

A UPS Store offering a number of business services is located on the 2nd Level of the Music City Center. Hours of operation are Monday through Friday, 9:00 a.m. to 5:00 p.m. (Closed Saturday and Sunday)

For more information, visit
www.theupsstorelocal.com/6425.

REFRESHMENTS

Hot and iced coffee, espresso drinks, donuts, muffins, oatmeal, and bagels are available for purchase at the Dunkin Donuts on the first level of the Music City Center. Hours of operation are Monday through Friday, 6:00 a.m. to 7:00 p.m. and weekends, 6:00 a.m. to 6:00 p.m.

For your convenience, on Monday and Tuesday there will be concession stands selling lunch options on Level 3 of the Music City Center. On Monday these will be available on the concourse outside of Hall A and on Tuesday they will be available in the TMS Exhibit Hall (Hall B).

TMS FOUNDATION Silent AUCTION

Location: Entrance to the TMS2016 Exhibit Hall, Music City Center

Hours

Monday: 2:00 p.m. to 6:30 p.m.
Tuesday: 10:00 a.m. to 5:30 p.m.
Wednesday: 10:00 a.m. to Noon

Own a Piece of Pop Culture History and Support a Great Cause

Browse and bid at the TMS Foundation Silent Auction. Autographed guitars, vinyl albums, movie posters, and original art are just some of the treasures that you can take home with a winning bid. Not into memorabilia? How about a luxury vacation or one-of-a-kind handcrafted item created by a TMS member? All proceeds from the Silent Auction benefit the student scholarship and leadership development programs for young professionals supported by the TMS Foundation.

Learn more about the TMS Foundation:
www.TMSFoundation.org

Get to know TMS!

TMS MEMBERSHIP Café

Hours of Operation

Sunday, February 14, 7:00 a.m. to 6:00 p.m.
Monday, February 15, 7:00 a.m. to 6:00 p.m.
Tuesday, February 16, 7:00 a.m. to 5:30 p.m.
Wednesday, February 17, 7:00 a.m. to 5:00 p.m.
Thursday, February 18, 7:00 a.m. to 2:00 p.m.

Located in the Exhibit Hall Concourse on Level 3 of the Music City Convention Center (near Registration)

The TMS Membership Café provides attendees with a comfortable spot to regroup, meet with colleagues, and learn about the benefits of TMS membership. By registering for TMS2016 at the full conference rate, you become an official member of the TMS family. Come to the Membership Café to learn all about what TMS has to offer.

REGISTRATION & MEETING LOGISTICS

ROOMS FOR NURSING MOTHERS

Designated rooms are available at the Music City Center and at the Omni Nashville Hotel for nursing mothers. To access these private rooms, contact TMS Meeting Services at the TMS Membership Café.

STAY INFORMED

The following tools will help you to stay informed of any last-minute schedule changes and news from conference events.

TMS2016 MOBILE APP

A lightweight alternative to the at-meeting program you are currently holding, the TMS2016 mobile application can serve as your compact, hand-held guide to the meeting. This free conference tool is available on the App Store and the Google Play™ Store. To download the App, search “TMS Annual Meeting” in your respective device store.

The App’s features include:

- Latest programming schedule
- Complete abstracts
- Ability to build your personal schedule and download to your device
- Speaker information
- Exhibit map
- Exhibitors and sponsors
- Venue information
- Access to TMS2016 News

The App is also linked to the TMS Personal Conference Scheduler, so if you already created a schedule with that program, you can view it through the App.

TMS2016 NEWS:

YOUR MEETING NEWSLETTER

Want to stay informed of everything that’s happening at the TMS 2016 Annual Meeting & Exhibition? *TMS2016 News*, a daily newsletter reporting conference activities and events, will be published each morning, Sunday through Thursday, during the conference. You can access the newsletter through the TMS2016 app at any time, through the TMS2016 website, or by clicking on the link in the notification e-mail we’ll send each morning.

Each issue will provide a reminder of the big events planned for the day, as well as recaps and photos from events happening around the meeting. So before you start your day at TMS2016, sit down with a cup of coffee and skim *TMS2016 News* so that you don’t miss a thing! (Not sure where to find a cup of coffee? The newsletter can tell you that, too.)

TWEET YOUR OWN UPDATES

Keep each other updated on meeting activities, interesting talks, and tips on the best local restaurants. Use #MyTMS2016 to tweet your observations to @TMSociety.

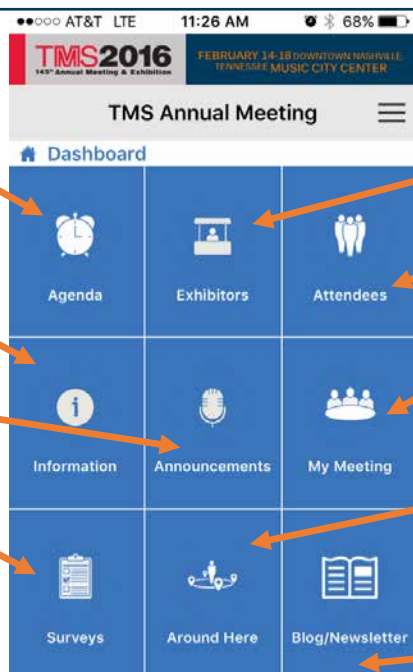
TMS2016 APP DASHBOARD

Get the full TMS2016 schedule including technical sessions/ presentations, socials, business meetings, and exhibition.

Find updates and information about special events, Collected Proceedings, venue maps, and general TMS2016 information.

Discover any major changes or important advisories (you can also opt to receive notification pop-ups).

Provide feedback about the TMS2016 mobile application, select sessions, and provide comments.



View a complete list of exhibiting companies, exhibit hall map, and schedule appointments.

Explore the names of other TMS2016 attendees and send messages.

Access saved sessions you want to attend, exhibitors you wish to visit, notes, and more.

Need transportation, restaurant options, or the nearest pharmacy? See what’s nearby.

Keep up with the latest TMS2016 news!

MEETING POLICIES

BADGES

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

GUEST SESSION ACCESS

Each full-conference attendee is permitted up to two guests for one session at which they are presenting. This does not include colleagues or exhibitors. This access is intended for family members who wish to listen to one talk presented by their relative. No one under the age of 18 is permitted to attend. Please provide the names of the guests who will be attending your presentations at the registration desk.

GUEST FUNCTION TICKETS

You may purchase additional tickets to social functions for your guests at registration.

REFUND POLICY

The deadline for all refunds was January 8, 2016. No refunds will be issued at the meeting. Fees and tickets are nonrefundable. TMS is not responsible for "no show" presenters. Presenters are scheduled and advertised in good faith based on the presenter's proposal to be included in the program.

ANTI-HARASSMENT POLICY

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

PHOTOGRAPHY AND RECORDING POLICY



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

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

ANTITRUST COMPLIANCE POLICY

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

AMERICANS WITH DISABILITIES ACT




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 at the TMS Membership Café.

CELL PHONE USE

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

RECYCLING

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

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

CALENDAR OF EVENTS

As of January 21, 2016

| Function | Date | Time | Facility | Room | Access |
|----------|------|------|----------|------|--------|
|----------|------|------|----------|------|--------|

Saturday, February 13

Committee and Business Meetings

| | | | | | |
|---|---------|--------------------|---------|----------------|---|
| Professional Registration Item Writers Workshop and Committee Meeting | 2/13/16 | 9:00 AM to 5:00 PM | Omni | Music Row 5 | R |
| TMS Financial Planning Committee Meeting | 2/13/16 | 2:00 PM to 5:00 PM | Omni | Music Row 6 | R |
| Professional Registration Committee Dinner | 2/13/16 | 6:00 PM to 8:00 PM | Offsite | Restaurant TBD | R |

Sunday, February 14

All-Conference Events

| | | | | | |
|---|---------|---------------------|-----|-----------------------------|---|
| Registration | 2/14/16 | 7:00 AM to 6:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| TMS Membership Cafe | 2/14/16 | 7:00 AM to 6:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Programming Support Desk | 2/14/16 | 12:00 PM to 6:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Set up for Poster Session I, "Meet the Candidate" Interactive Session, and Young Professional and Student Poster Sessions | 2/14/16 | 4:30 PM to 6:00 PM | MCC | Hall C | O |
| TMS 101: Fundamentals of TMS | 2/14/16 | 5:00 PM to 5:30 PM | MCC | 208A | O |
| TMS2016 Opening Celebration | 2/14/16 | 5:00 PM to 6:30 PM | MCC | Davidson Ballroom A | O |

Exhibition

| | | | | | |
|-----------------|---------|--------------------|-----|--------|---|
| Exhibit Move In | 2/14/16 | 8:00 AM to 5:00 PM | MCC | Hall B | R |
|-----------------|---------|--------------------|-----|--------|---|

Professional Development & Special Lectures

| | | | | | |
|--|---------|---------------------|-----|------|---|
| NSF Grant Proposal Writing Workshop | 2/14/16 | 8:30 AM to 12:00 PM | MCC | 206A | T |
| Energy Management in the Materials Industry Workshop | 2/14/16 | 8:30 AM to 12:30 PM | MCC | 206B | T |
| 12th Annual Lead-Free Solders and Interconnect Technology Workshop | 2/14/16 | 8:30 AM to 4:30 PM | MCC | 201A | T |
| Multiphysics Materials Simulations using the Open Source MOOSE Framework Workshop | 2/14/16 | 8:30 AM to 4:30 PM | MCC | 201B | T |
| Effects and Control of Impurities Along the Aluminum Value Chain Course | 2/14/16 | 8:30 AM to 4:30 PM | MCC | 203B | T |
| Avizo 3D Analysis Software for Materials Science | 2/14/16 | 1:00 PM to 4:30 PM | MCC | 205A | T |
| Explore CES Software Tools for Materials Related Critical Decision-Making in Industry, Research and Education Workshop | 2/14/16 | 1:00 PM to 4:30 PM | MCC | 206A | T |
| Practical Methods of "In-Plant" Testing of Carbon Anodes Used in Aluminum Smelting Workshop | 2/14/16 | 1:00 PM to 4:30 PM | MCC | 202A | T |
| Additive Manufacturing Materials and Processes Workshop | 2/14/16 | 1:00 PM to 5:30 PM | MCC | 204 | T |

■ MCC- Music City Center, ■ Omni- Omni Nashville Downtown Hotel

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

CALENDAR OF EVENTS

As of January 21, 2016

| Function | Date | Time | Facility | Room | Access |
|--|---------|----------------------|----------|---------------------|--------|
| Social Functions | | | | | |
| Materials Bowl Competition | 2/14/16 | 12:00 PM to 7:00 PM | MCC | Davidson Ballroom B | O |
| - Elimination Rounds | 2/14/16 | 12:00 PM to 4:00 PM | MCC | Davidson Ballroom B | O |
| - Championship Round | 2/14/16 | 6:30 PM to 7:00 PM | MCC | Davidson Ballroom B | O |
| Student Networking Mixer | 2/14/16 | 7:00 PM to 9:00 PM | MCC | Davidson Ballroom C | O |
| Social Functions | | | | | |
| TMS Fellows and Invited Guests Reception | 2/14/16 | 4:30 PM to 6:30 PM | MCC | Seating Lounge (L3) | I |
| Committee & Business Meetings | | | | | |
| New Board Member Orientation | 2/14/16 | 8:30 AM to 10:00 AM | Omni | Music Row 5 | I |
| TMS Board of Directors Meeting | 2/14/16 | 10:00 AM to 12:00 PM | Omni | Music Row 5 | I |
| Recycling and Environmental Technologies Committee Meeting | 2/14/16 | 12:00 PM to 1:30 PM | Omni | Cumberland 1 | O |
| Accreditation Committee Meeting | 2/14/16 | 12:30 PM to 2:30 PM | Omni | Cumberland 3 | O |
| Magnesium Committee Meeting | 2/14/16 | 1:30 PM to 3:00 PM | MCC | 205B | O |
| TMS Nominating Committee Meeting | 2/14/16 | 1:30 PM to 3:00 PM | Omni | Music Row 6 | I |
| Aluminum Committee Meeting | 2/14/16 | 2:00 PM to 4:00 PM | MCC | 205C | O |
| Materials Characterization Committee Meeting | 2/14/16 | 2:30 PM to 4:00 PM | Omni | Legends D | O |
| ABET Refresher Training | 2/14/16 | 3:00 PM to 5:00 PM | Omni | Cumberland 5 | O |
| PRICM-9 International Organizing Committee Meeting | 2/14/16 | 3:00 PM to 5:00 PM | Omni | Mockingbird 4 | I |
| Public & Governmental Affairs Committee Meeting | 2/14/16 | 3:30 PM to 5:00 PM | Omni | Cumberland 3 | O |
| Hydrometallurgy and Electrometallurgy Committee Meeting | 2/14/16 | 4:00 PM to 5:00 PM | Omni | Music Row 4 | O |
| Nanomaterials Committee Meeting | 2/14/16 | 4:00 PM to 5:00 PM | Omni | Cumberland 6 | O |
| TMS Program Committee Meeting | 2/14/16 | 4:00 PM to 6:00 PM | Omni | Music Row 5 | I |
| Diversity Committee Meeting | 2/14/16 | 4:30 PM to 6:00 PM | Omni | Legends B | O |
| JOM Advisor Orientation | 2/14/16 | 5:00 PM to 6:00 PM | Omni | Cumberland 4 | I |
| Nanomechanical Materials Behavior Committee Meeting | 2/14/16 | 5:45 PM to 6:45 PM | Omni | Legends E | O |
| Process Technology and Modeling Committee Meeting | 2/14/16 | 6:00 PM to 7:00 PM | Omni | Cumberland 3 | O |
| Thin Films and Interfaces Committee Meeting | 2/14/16 | 6:00 PM to 7:00 PM | Omni | Mockingbird 4 | O |
| Pyrometallurgy Committee Meeting | 2/14/16 | 6:00 PM to 7:30 PM | Omni | Legends F | O |
| Materials Innovation Committee Meeting | 2/14/16 | 6:00 PM to 7:30 PM | Omni | Cumberland 2 | O |
| Content Development and Dissemination Committee Meeting | 2/14/16 | 6:00 PM to 8:00 PM | Omni | Music Row 4 | I |
| Professional Development Committee Meeting | 2/14/16 | 6:00 PM to 8:00 PM | Omni | Music Row 6 | I |
| Mechanical Behavior of Materials Committee Meeting | 2/14/16 | 7:00 PM to 8:30 PM | Omni | Legends E | O |
| Alloy Phases Committee Meeting | 2/14/16 | 7:30 PM to 9:00 PM | Omni | Cumberland 6 | O |
| Phase Transformation Committee Meeting | 2/14/16 | 7:30 PM to 9:00 PM | Omni | Cumberland 1 | O |

■ MCC- Music City Center, ■ Omni- Omni Nashville Downtown Hotel

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

CALENDAR OF EVENTS

As of January 21, 2016

| Function | Date | Time | Facility | Room | Access |
|----------|------|------|----------|------|--------|
|----------|------|------|----------|------|--------|

Monday, February 15

All-Conference Events

| | | | | | |
|---|---------|---------------------|---|-----------------------------|---|
| Registration | 2/15/16 | 7:00 AM to 6:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Programming Support Desk | 2/15/16 | 7:00 AM to 6:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Presenters' Coffee | 2/15/16 | 7:00 AM to 8:00 AM | MCC | Hall C | O |
| TMS Membership Cafe | 2/15/16 | 7:00 AM to 6:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Set up for Poster Session I, "Meet the Candidate" Interactive Session, and Young Professional and Student Poster Sessions | 2/15/16 | 7:00 AM to 8:30 AM | MCC | Hall C | O |
| Technical Programming | 2/15/16 | 8:30 AM to 5:30 PM | See Technical Program section for complete schedule and locations | | O |
| Poster Session I and "Meet the Candidate" Interactive Session Gallery | 2/15/16 | 8:30 AM to 6:30 PM | MCC | Hall C | O |
| Morning Break | 2/15/16 | 9:50 AM to 10:30 AM | MCC | | O |
| Lunch Concession Stands (Cash Sales) | 2/15/16 | 12:00 PM to 2:00 PM | MCC | Hall A Concourse | O |
| Afternoon Break | 2/15/16 | 3:20 PM to 4:00 PM | MCC | | O |
| Young Professional Technical Division Poster Contest | 2/15/16 | 5:00 PM to 6:30 PM | MCC | Hall C | O |
| Technical Division Student Poster Contest (Judging) | 2/15/16 | 5:00 PM to 6:30 PM | MCC | Hall C | O |
| Young Professional Meet the Candidate Interactive Session | 2/15/16 | 6:30 PM to 8:30 PM | MCC | Hall C | O |
| Poster Session I Presentations and Reception | 2/15/16 | 6:30 PM to 8:30 PM | MCC | Hall C | O |

Exhibition

| | | | | | |
|---------------------------------|---------|--------------------|-----|--------|---|
| TMS 2016 Exhibition | 2/15/16 | 2:00 PM to 6:30 PM | MCC | Hall B | O |
| TMS Foundation Silent Auction | 2/15/16 | 2:00 PM to 6:30 PM | MCC | Hall B | O |
| President's Welcoming Reception | 2/15/16 | 5:00 PM to 6:30 PM | MCC | Hall B | O |

Professional Development & Special Lectures

| | | | | | |
|---------------|---------|--------------------|------|-----------|---|
| Meet-a-Mentor | 2/15/16 | 4:30 PM to 6:00 PM | Omni | Legends D | R |
|---------------|---------|--------------------|------|-----------|---|

Social Functions

| | | | | | |
|--|---------|---------------------|---------|-------------------------|---|
| Women in Materials Science & Engineering Breakfast | 2/15/16 | 7:00 AM to 8:00 AM | MCC | Davidson Ballroom C1-C2 | T |
| SMD Luncheon | 2/15/16 | 12:00 PM to 2:00 PM | Omni | Legends E&F | T |
| TMS Partner Society Reception | 2/15/16 | 4:30 PM to 5:30 PM | Omni | Mockingbird 4 | I |
| Young Professionals Reception | 2/15/16 | 6:00 PM to 7:00 PM | Omni | Legends B | O |
| Christopher W. Bale Honorary Dinner | 2/15/16 | 6:30 PM to 9:00 PM | Omni | Legends E&F | T |
| Gary Purdy Honorary Dinner | 2/15/16 | 6:30 PM to 9:00 PM | Omni | Legends C | T |
| President's Invitational Dinner | 2/15/16 | 6:30 PM to 9:30 PM | Offsite | City Winery | I |

■ MCC- Music City Center, ■ Omni- Omni Nashville Downtown Hotel

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

CALENDAR OF EVENTS

As of January 21, 2016

| Function | Date | Time | Facility | Room | Access |
|---|---------|----------------------|----------|---------------|--------|
| Committee & Business Meetings | | | | | |
| <i>Metallurgical and Materials Transactions A Board of Review</i> | 2/15/16 | 7:00 AM to 8:00 AM | Omni | Legends C | I |
| Past AIME Trustees Meeting | 2/15/16 | 7:00 AM to 9:00 AM | Omni | Mockingbird 4 | I |
| Membership & Student Development Committee Meeting | 2/15/16 | 8:30 AM to 9:45 AM | Omni | Music Row 4 | R |
| TMS Executive Committee Meeting | 2/15/16 | 10:00 AM to 11:00 AM | Omni | Music Row 6 | I |
| TMS Past Presidents Meeting | 2/15/16 | 11:30 AM to 1:00 PM | Omni | Legends A | I |
| Superalloys 2016 Program Committee Meeting | 2/15/16 | 12:00 PM to 2:00 PM | Omni | Music Row 4 | I |
| Powder Materials Committee Meeting | 2/15/16 | 12:30 PM to 2:00 PM | MCC | 203B | O |
| Integrated Computational Materials Engineering Committee Meeting | 2/15/16 | 12:15 PM to 1:45 PM | Omni | Legends B | O |
| Ad Hoc International Affairs Committee Meeting | 2/15/16 | 3:00 PM to 4:00 PM | Omni | Music Row 6 | I |
| Superalloys 2016 Organizing Committee Meeting | 2/15/16 | 5:00 PM to 7:00 PM | Omni | Music Row 5 | I |
| Advanced Characterization, Testing and Simulation Committee Meeting | 2/15/16 | 5:45 PM to 6:45 PM | MCC | 103B | O |
| Composite Materials Committee Meeting | 2/15/16 | 5:45 PM to 6:45 PM | MCC | 110A | O |
| Biomaterials Committee Meeting | 2/15/16 | 6:00 PM to 7:00 PM | MCC | 207A | O |
| Energy Conversion and Storage Committee Meeting | 2/15/16 | 6:00 PM to 7:00 PM | MCC | 104D | O |
| Nuclear Materials Committee Meeting | 2/15/16 | 6:00 PM to 7:00 PM | MCC | 101B | O |
| Solidification Committee Meeting | 2/15/16 | 6:00 PM to 7:00 PM | MCC | 105A | O |
| Surface Engineering Committee Meeting | 2/15/16 | 6:00 PM to 7:00 PM | MCC | 101D | O |
| Chemistry and Physics of Materials Committee Meeting | 2/15/16 | 6:00 PM to 7:30 PM | MCC | 108 | O |
| Materials & Society Committee Meeting | 2/15/16 | 6:00 PM to 8:00 PM | Omni | Music Row 4 | O |
| Additive Manufacturing Bridge Committee Meeting | 2/15/16 | 7:00 PM to 8:00 PM | MCC | 205B | O |
| Magnetic Materials Committee Meeting | 2/15/16 | 7:00 PM to 8:00 PM | MCC | 209C | O |

Tuesday, February 16

All-Conference Events

| | | | | | |
|---|---------|---------------------|---|-----------------------------|---|
| Registration | 2/16/16 | 7:00 AM to 5:30 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Programming Support Desk | 2/16/16 | 7:00 AM to 6:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Presenters' Coffee | 2/16/16 | 7:00 AM to 8:00 AM | MCC | Hall C | O |
| TMS Membership Cafe | 2/16/16 | 7:00 AM to 5:30 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Poster Session I and "Meet the Candidate" Interactive Session Gallery | 2/16/16 | 8:30 AM to 12:00 PM | MCC | Hall C | O |
| Technical Programming | 2/16/16 | 8:30 AM to 5:30 PM | See Technical Program section for complete schedule and locations | | O |
| Morning Break | 2/16/16 | 9:50 AM to 10:30 AM | MCC | | O |
| Poster Session I Dismantle | 2/16/16 | 12:00 PM to 2:00 PM | MCC | Hall C | |
| Afternoon Break | 2/16/16 | 3:20 PM to 4:00 PM | MCC | | O |
| Poster Session II set-up | 2/16/16 | 4:30 PM to 6:00 PM | MCC | Hall C | |

■ MCC- Music City Center, ■ Omni- Omni Nashville Downtown Hotel

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

CALENDAR OF EVENTS

As of January 21, 2016

| Function | Date | Time | Facility | Room | Access |
|--|---------|----------------------|----------|-------------------------|--------|
| Exhibition | | | | | |
| TMS2016 Exhibition | 2/16/16 | 10:00 AM to 5:30 PM | MCC | Hall B | O |
| TMS Foundation Silent Auction | 2/16/16 | 10:00 AM to 5:30 PM | MCC | Hall B | O |
| Lunch Concession Stands (Cash Sales) | 2/16/16 | 12:00 PM to 2:00 PM | MCC | Hall B | O |
| Happy Hour Reception | 2/16/16 | 4:30 PM to 5:30 PM | MCC | Hall B | O |
| Professional Development & Special Lectures | | | | | |
| Young Professional Tutorial Luncheon | 2/16/16 | 12:00 PM to 12:45 PM | Omni | Legends D | T |
| Young Professional Tutorial Lecture | 2/16/16 | 12:45 PM to 2:00 PM | Omni | Legends D | O |
| Student Events | | | | | |
| Student Career Forum | 2/16/16 | 2:15 PM to 4:15 PM | Omni | Legends B | O |
| Social Functions | | | | | |
| EPD/MPMD Luncheon | 2/16/16 | 12:00 PM to 2:00 PM | Omni | Legends E&F | T |
| TMS-AIME Awards Reception | 2/16/16 | 6:00 PM to 6:30 PM | MCC | Davidson Ballroom Foyer | O |
| TMS-AIME Awards Ceremony | 2/16/16 | 6:30 PM to 7:45 PM | MCC | Davidson Ballroom B | O |
| TMS-AIME Awards Banquet | 2/16/16 | 7:45 PM to 9:30 PM | MCC | Davidson Ballroom A | T |
| Committee & Business Meetings | | | | | |
| <i>Metallurgical and Materials Transactions B</i> Board of Review | 2/16/16 | 7:00 AM to 8:00 AM | Omni | Music Row 4 | I |
| Electronic Packaging and Interconnection Materials Committee Meeting | 2/16/16 | 7:00 AM to 8:00 AM | Omni | Legends B | O |
| Fellows Award Committee Meeting | 2/16/16 | 7:30 AM to 8:30 AM | Omni | Mockingbird 4 | R |
| Young Professionals Committee Meeting | 2/16/16 | 8:15 AM to 9:45 AM | Omni | Legends D | O |
| Honors & Professional Recognition Committee Meeting | 2/16/16 | 8:30 AM to 9:30 AM | Omni | Mockingbird 4 | R |
| Pan American Congress Organizing Committee Meeting | 2/16/16 | 9:00 AM to 10:30 AM | Omni | Music Row 6 | I |
| TMS-CSM 2017 Energy Materials Conference Discussion | 2/16/16 | 10:30 AM to 11:30 AM | Omni | Music Row 5 | I |
| TMS-CSM Leadership Meeting | 2/16/16 | 11:30 AM to 1:00 PM | Omni | Music Row 6 | I |
| Education Committee Meeting | 2/16/16 | 12:30 PM to 2:00 PM | Omni | Music Row 5 | O |
| TMS-SMM Leadership Meeting | 2/16/16 | 2:00 PM to 3:00 PM | Omni | Music Row 6 | I |
| Titanium Committee Meeting | 2/16/16 | 5:00 PM to 6:00 PM | Omni | Music Row 4 | O |
| Shaping and Forming Committee Meeting | 2/16/16 | 5:00 PM to 6:30 PM | Omni | Music Row 5 | O |
| Energy Committee Meeting | 2/16/16 | 5:30 PM to 6:30 PM | Omni | Mockingbird 4 | O |
| Corrosion and Environmental Effects Committee Meeting | 2/16/16 | 5:30 PM to 6:30 PM | MCC | 104E | O |
| Refractory Metals & Materials Committee Meeting | 2/16/16 | 5:30 PM to 6:30 PM | MCC | 106B | O |
| Computational Materials Science & Engineering Committee Meeting | 2/16/16 | 5:45 PM to 6:45 PM | MCC | 207D | O |
| High Temperature Alloys Committee Meeting | 2/16/16 | 5:45 PM to 7:15 PM | MCC | 105B | O |

■ MCC- Music City Center, ■ Omni- Omni Nashville Downtown Hotel

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

CALENDAR OF EVENTS

As of January 21, 2016

| Function | Date | Time | Facility | Room | Access |
|----------|------|------|----------|------|--------|
|----------|------|------|----------|------|--------|

Wednesday, February 17

All-Conference Events

| | | | | | |
|---|---------|---------------------|---|-----------------------------|---|
| Registration | 2/17/16 | 7:00 AM to 5:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Programming Support Desk | 2/17/16 | 7:00 AM to 6:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Presenters' Coffee | 2/17/16 | 7:00 AM to 8:00 AM | MCC | Hall C | O |
| Poster Session II Set-Up | 2/17/16 | 7:00 AM to 8:30 AM | MCC | Hall C | O |
| TMS Membership Cafe | 2/17/16 | 7:00 AM to 5:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Technical Programming | 2/17/16 | 8:30 AM to 5:30 PM | See Technical Program section for complete schedule and locations | | O |
| Poster Session II Gallery | 2/17/16 | 8:30 AM to 6:30 PM | MCC | Hall C | |
| Morning Break | 2/17/16 | 9:50 AM to 10:30 AM | MCC | | O |
| Afternoon Break | 2/17/16 | 3:20 PM to 4:00 PM | MCC | | O |
| Poster Session II Presentations and Reception | 2/17/16 | 6:30 PM to 8:30 PM | MCC | Hall C | O |

Exhibition

| | | | | | |
|-------------------------------|---------|----------------------|-----|--------|---|
| TMS2016 Exhibition | 2/17/16 | 10:00 AM to 2:00 PM | MCC | Hall B | O |
| TMS Foundation Silent Auction | 2/17/16 | 10:00 AM to 12:00 PM | MCC | Hall B | O |
| Attendee Luncheon | 2/17/16 | 12:00 PM to 2:00 PM | MCC | Hall B | T |

Social Functions

| | | | | | |
|-------------------------------|---------|---------------------|------|-------------|---|
| LMD Luncheon | 2/17/16 | 12:00 PM to 2:00 PM | Omni | Legends E&F | T |
| TMS2017 Programming Reception | 2/17/16 | 5:30 PM to 7:00 PM | Omni | Legends C | I |

Committee & Business Meetings

| | | | | | |
|--|---------|---------------------|------|-------------|---|
| TMS Audit Committee Meeting | 2/17/16 | 7:30 AM to 8:00 AM | Omni | Music Row 6 | R |
| TMS Annual Business Meeting | 2/17/16 | 8:25 AM to 8:30 AM | Omni | Music Row 5 | O |
| TMS Board of Directors Meeting | 2/17/16 | 8:30 AM to 11:45 AM | Omni | Music Row 5 | I |
| Bladesmithing Committee Meeting | 2/17/16 | 9:00 AM to 10:00 AM | Omni | Music Row 6 | O |
| TMS Foundation Board of Trustees Meeting | 2/17/16 | 2:30 PM to 5:00 PM | Omni | Music Row 5 | I |
| REWAS Committee Meeting | 2/17/16 | 5:30 PM to 7:00 PM | Omni | Music Row 6 | O |

Thursday, February 18

All-Conference Events

| | | | | | |
|--------------------------|---------|--------------------|-----|-----------------------------|---|
| Registration | 2/18/16 | 7:00 AM to 5:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Programming Support Desk | 2/18/16 | 7:00 AM to 5:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Presenters' Coffee | 2/18/16 | 7:00 AM to 8:00 AM | MCC | Hall C | O |

■ MCC- Music City Center, ■ Omni- Omni Nashville Downtown Hotel

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

CALENDAR OF EVENTS

As of January 21, 2016

| Function | Date | Time | Facility | Room | Access |
|-----------------------------|---------|---------------------|---|-----------------------------|--------|
| TMS Membership Cafe | 2/18/16 | 7:00 AM to 2:00 PM | MCC | Exhibit Hall Concourse (L3) | O |
| Poster Session II Gallery | 2/18/16 | 8:30 AM to 12:00 PM | MCC | Hall C | |
| Technical Programming | 2/18/16 | 8:30 AM to 5:30 PM | See Technical Program section for complete schedule and locations | | O |
| Morning Break | 2/18/16 | 9:50 AM to 10:30 AM | MCC | Multiple-Locations | O |
| Poster Session II dismantle | 2/18/16 | 12:00 PM to 2:00 PM | MCC | Hall C | |
| Afternoon Break | 2/18/16 | 3:20 PM to 4:00 PM | MCC | Multiple-Locations | O |
| Social Functions | | | | | |
| Repeat Attendee Luncheon | 2/18/16 | 12:00 PM to 1:30 PM | Omni | Legends E&F | I |

■ MCC- Music City Center,
 ■ Omni- Omni Nashville Downtown Hotel
O - Open to all attendees **R** - Restrictions Apply **I** - Invitation Only **T** - Ticketed Event, Pre-registration required

Alumina Technology

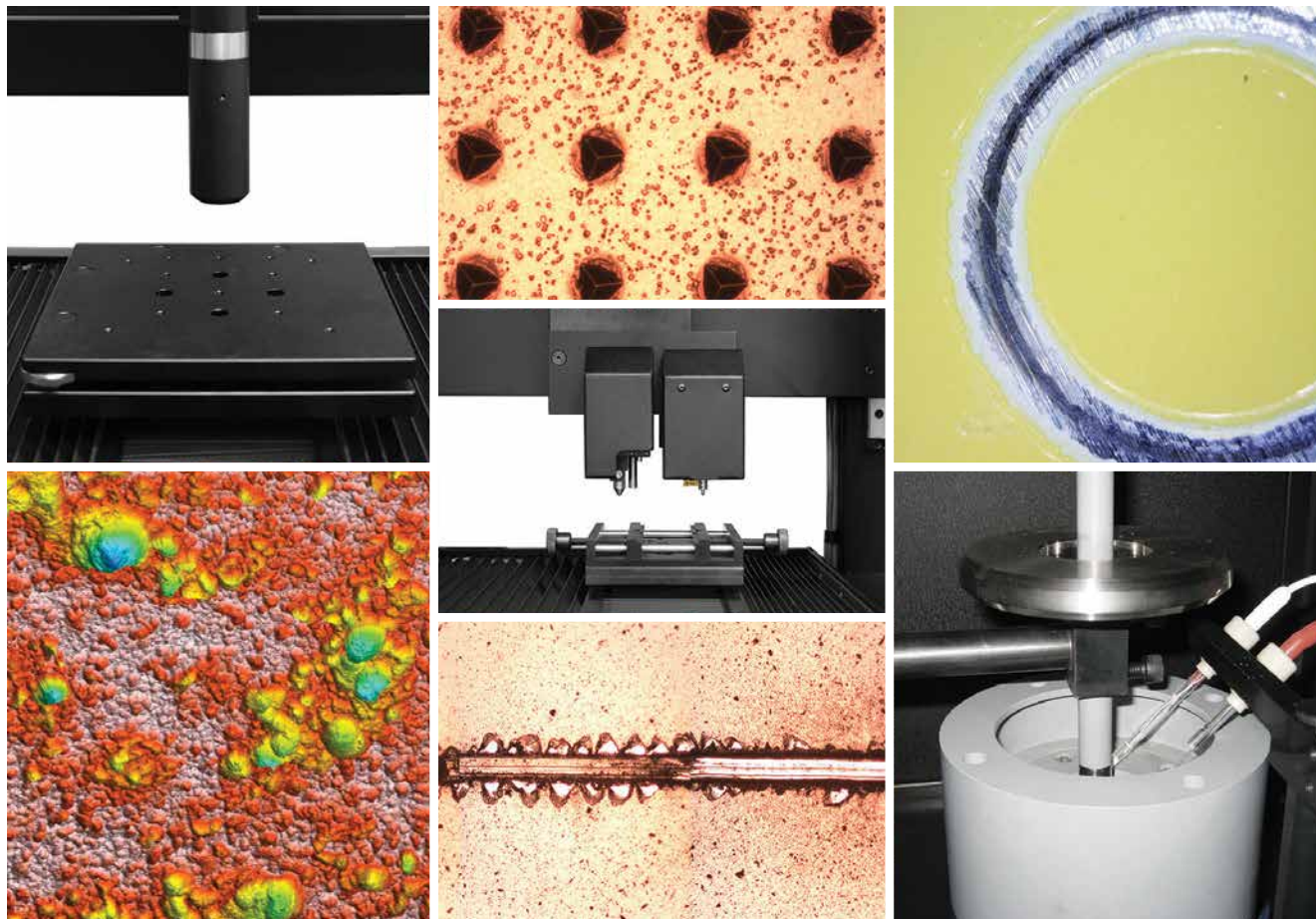
Advanced refinery solutions
tailored to your bauxite quality

Drawing on more than 100 years of Bayer process development, design and operating experience, our proven technology solutions are supported by a unique set of training, commissioning and support services.

For inquiries: antonio.pucci@riotinto.com

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

RioTinto



Nanovea began designing and manufacturing instruments after years of experience in providing solutions for profilometry, mechanical and tribology applications. Firmly aligned with its vision, Nanovea aims to simplify advanced measurement technology to stimulate materials engineering for the common good. Ease of use, advanced automation and the dedication to superior accuracy are the driving forces behind Nanovea's full range of Profilometers, Mechanical Testers and Tribometers. Unlike other manufacturers, Nanovea also provides Laboratory & consulting services. Thus, clients are given access to years of experience in finding solutions to improve quality control and materials development. Nanovea offers many critically important tests including surface roughness, nanoindentation, scratch and wear testing among many others. Nanovea's instruments can be found internationally in distinguished educational and industrial organizations ranging from automotive to cosmetic, biotechnology to medical devices to microelectronics and space applications. Thousands of clients rely on Nanovea for accurate solutions, technically superior instruments, experienced assistance and comprehensive laboratory services.

TMS 101: FUNDAMENTALS OF TMS

Date: Sunday, February 14, 2016

Time: 5:00 p.m. to 5:30 p.m.

Location: Music City Center, 208A

Sponsored by the TMS Professional Development Committee

Want to get more involved in TMS, but don't know where to start? Attend **TMS 101: Fundamentals of TMS**. This half-hour presentation will provide a brief overview of how TMS works and a concise, practical explanation of how you can get more involved in the society's activities. Led by experienced TMS volunteers, TMS 101 will help you to take advantage of the many networking and professional development opportunities within the organization.

This session is open to all TMS2016 attendees but will be especially valuable to new members, international members, and graduate students.

All participants are invited to continue networking at the TMS2016 Opening Celebration immediately following this session. Here, you will be encouraged to further discuss opportunities to participate in TMS activities, such as joining a TMS technical committee or contributing to programming and publications.

Presenters:



Jeffrey W. Fergus,
Associate Dean,
Auburn University



Clarissa Yablinsky,
Scientist, Los Alamos National
Laboratory

TMS2016 LIGHT METALS

KEYNOTE SESSION

Pushing Boundaries—Innovative Thinking in Light Metals Production

Date: Monday, February 15, 2016

Time: 8:30 a.m. to 10:30 a.m.

Location: Music City Center, Room 202

Presenters:



"Aluminum: Modern, Innovative, Attractive"

Martin Iffert,
CEO, Trimet Aluminium SE



"Lightweighting: What is the Future for the Automotive Industry?"

Stephane Delalande, Deputy
Scientific Director, PSA Peugeot
Citroën

WANT TO GET INVOLVED?

**ATTEND ONE OF THE MANY
OPEN TECHNICAL COMMITTEE
MEETINGS BEING HELD THIS
WEEK TO MEET COLLEAGUES
WITH SIMILAR INTERESTS
AND BECOME A CONTRIBUTING
MEMBER OF THE TMS
COMMUNITY.**

FEATURED SESSIONS

MAGNESIUM TECHNOLOGY

KEYNOTE SESSION

Date: Monday, February 15, 2016

Time: 8:30 a.m. to 2:30 p.m.

Location: Music City Center, Room 204

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

“Challenges for Implementation of Magnesium into More Applications”

Karl Kainer, Helmholtz-Zentrum Geesthacht, Germany

“Development of Magnesium Alloys for High Speed Trains in China”

Eric Nyberg, Pacific Northwest National Laboratory, USA

“Korea’s R&D Activities Towards the Application of Wrought Mg Alloys”

Nack J. Kim, POSTECH, Korea South

“Mg Alloys Strengthened by Complex Phases”

Alok Singh, National Institute for Materials Science, Japan

“Developments in High Magnesium-Content Bulk Metallic Glasses and Future Possibilities”

Kevin Laws, University of New South Wales, Australia

“A Perspective: Potential Growth in the Global Magnesium Industry – Where is our Research Leading Us?”

Martyn Alderman, Magnesium Elektron, Great Britain

REWAS 2016 PLENARY SESSION:

REWAS 2016 Materials Matter: Deriving Value from Resource Recovery at Multiple Materials Scales

Date: Tuesday, February 16, 2016

Time: 8:30 a.m. to Noon

Location: Music City Center, Room 104B

This special plenary session will be a highlight of the REWAS2016 technical program. REWAS is a trans-disciplinary conference—held as part of the TMS 2016 Annual Meeting & Exhibition—where materials professionals can exchange ideas with

those in other research fields and stakeholders to synergistically define the way toward a resource-efficient industry and society.

The following invited speakers will deliver their presentations and participate in panel discussions with the audience.

“Gold’s Evolving Role in the Circular Economy”

Trevor Keel, Consultant to the World Gold Council

“Automotive Recycling Innovations in Aluminum”

Sil Colalancia, Novelis

“Digitalizing the Circular Economy -System-Integrated-Material-Production”

Markus Reuter, Helmholtz Institute Freiberg for Resource Technology, and 2016 TMS Extraction & Processing Division Distinguished Lecturer

“Industrial Symbiosis and Materials Management: Physical Resource Sharing Among Proximate Firms”

Marian Chertow, Yale School of Forestry & Environmental Studies

“Water at the Heart of the Circular Economy”

Edwin Piñero, Veolia North America

“Environmental Impacts of Additive Manufacturing”

William P. Flanagan, General Electric Company

REWAS2016 CO-SPONSORING SOCIETIES



Mining and Materials Processing Institute of Japan (MMIJ)



Gesellschaft der Metallurgen und Bergleute (GDMB)



Federation of European Materials Societies (FEMS)



Southern African Institute of Mining & Metallurgy (SAIMM)



The Metallurgy and Materials Society of the Canadian Institute of Mining, Metallurgy and Petroleum (MetSoc of CIM)

2016 BLADESMITHING SYMPOSIUM

KEYNOTE PRESENTATION

Date: Tuesday, February 16, 2016

Time: 8:35 a.m.

Location: Music City Center, Room 104A



“Connections: Superplasticity, Damascus Steels, Laminates, the Giza Pyramid, and Carbon Dating”
Jeffrey Wadsworth, Battelle

In the mid-1970's, a race was underway to develop superplasticity in steels. This keynote presentation will describe how that research program led to a series of investigations into historical materials starting with Damascus Steels. The archaeometallurgy of swords and knives will be discussed starting with the early development of wood, bone, horn, and stone knives and evolving to the present time where modern Bladesmiths use an astonishing range of sophisticated materials and manufacturing methods.

ABOUT THE BLADESMITHING SYMPOSIUM

The 2016 Bladesmithing Symposium builds upon the phenomenal success of the Bladesmithing Competition held at TMS2015 last year and serves as a bridge to the next Bladesmithing Competition planned for TMS2017 in San Diego, California. Students and student teams will present their work associated with or inspired by the 2015 Bladesmithing Competition.

MATERIALS INNOVATION

KEYNOTE SESSION:

Multidisciplinary Materials Design

Optimization Under Uncertainty

Date: Wednesday, February 17, 2016

Time: 8:30 a.m.

Location: Music City Center, Room 207B

This special keynote session is organized by the TMS Materials Innovation Committee and will feature the following presentations:

“Morphing the Design Box: New Design Paradigms Enabled by Additive Manufacturing”
Rick Barto, Lockheed Martin

“Model-Based Materials Definitions for Design and Structural Analysis”
David Furrer, Pratt & Whitney

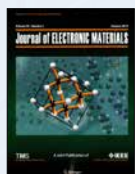
“Statistical Rigor Versus Statistical Confidence in the Optimal Design of Materials”
Michael McKerns, California Institute of Technology

“A Set-Based Approach for Hierarchical Materials Design”
Carolyn Seepersad, University of Texas at Austin

TMS Member Benefits



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



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

WILEY
Publications

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

TMS
Meetings

Receive discounts on registration fees for select upcoming meetings sponsored by TMS. Go to **www.tms.org/Meetings** to see a list of upcoming TMS events.

FEATURED SESSIONS

TMS2016 ACTA MATERIALIA SYMPOSIUM

Date: Wednesday, February 17, 2016

Time: 3:30 p.m.

Location: Music City Center Room 103C

This special symposium will honor two TMS members who will be accepting their prestigious Acta Materialia Awards at the TMS 2016 Annual Meeting & Exhibition. The session will include presentations by the award recipients:



"Structural Control for Enhanced Functional Materials"

Sungho Jin,

University of California, San Diego
Recipient of the 2016 Acta Materialia Gold Medal



"Even 'Green' Technologies Create Environmental Impact: A Case Study Perspective"

Julie Schoenung,

University of California, Irvine
Recipient of the 2016 Acta Materialia Hollomon Materials & Society Award

Symposium Sponsored by:



VOLUNTEER WITH TMS

Get Involved: Visit volunteer.tms.org.

WE CONVEY QUALITY

Defined Cooling of Hot Bath Material



For the Primary Aluminium Smelting Process

- Cooling from 850 °C down to below 100 °C
- Reduction of HF emission
- Clean and environmentally safe conveying and cooling



AUMUND Foerdertechnik GmbH

Saalloffer Str. 17 • 47495 Rheinberg • Germany
metallurgy@aumund.de • www.aumund.com

TMS 2017

146th Annual Meeting & Exhibition

**THE WORLD COMES HERE.
AND YOU SHOULD TOO.**



SAVE THE DATE

February 26 – March 2, 2017

San Diego, California, USA

TMS2017 welcomes two co-located international conferences, both included with your TMS2017 registration.



**3rd Pan American
Materials Congress**

San Diego, California
February 26-March 2, 2017

3rd Pan American Materials Congress

Hosted by TMS in cooperation with 7 materials societies spanning North and South America.

Energy Materials 2017

Energy Materials 2017

Organized by TMS and the Chinese Society for Metals

Join your colleagues from nearly 70 nations at the meeting that the global minerals, metals, and materials community calls home.

Call for Papers opens in May 2016.



HONORARY SYMPOSIA

Each year, the TMS Technical Divisions honor accomplished individuals with high-quality honorary symposia, inviting leaders in the honorees' fields to discuss progress and recent developments on important topics. The following honorary symposia are planned for the TMS 2016 Annual Meeting & Exhibition:

ADVANCED MAGNETIC MATERIALS



A Functional Materials Division Symposium in Honor of Michael E. McHenry

Dates: Monday, February 15 to Thursday, February 18

Location: Music City Center, Room 209C

This symposium will discuss recent developments in the processing, characterization, property evaluation, and product development of advanced magnetic materials. The contributions of Michael E. McHenry will be highlighted, and the current status and recent advances in relevant research areas will be discussed.

CAST SHOP TECHNOLOGY



A Light Metals Division Symposium in Honor of Wolfgang Schneider

Dates: Monday, February 15 to Thursday, February 18

Location: Music City Center, Room 202A

Part of the light metals program—where experts from the aluminum industry and academia from all over the world meet and share information—Cast Shop Technology will cover the following topic areas: sustainable operation, life cycle assessment, recycling impact and awareness, charge materials, upstream and downstream furnace treatment, melting, fluxing, filtration, degassing, DC casting, open mold ingot casting, automation, process modeling and control, environmental issues, grain refinement, cast structures and defects, and safety.

FRONTIERS IN SOLIDIFICATION



A Materials Processing & Manufacturing Division Symposium in Honor of Michel Rappaz

Dates: Monday, February 15 to Wednesday, February 17

Location: Music City Center, Room 105A

This symposium follows the now well-established symposium series “Frontiers in Solidification.” It is intended to present the latest results of modeling of solidification microstructures, such as solid-liquid interfaces and their anisotropies, nucleation phenomena, morphological instabilities, dendrites, eutectics, peritectics, fluid flow effects, segregation, and defects.

PHASE TRANSFORMATIONS IN MULTI-COMPONENT SYSTEMS



A Materials Processing & Manufacturing Division Symposium Honoring Gary R. Purdy

Dates: Monday, February 15 to Wednesday, February 17

Location: Music City Center, Room 110B

The modern materials for automotive, energy, and construction applications upon which modern societies depend, all rely on the understanding of phase transformations in alloy systems. It is to this area that Gary R. Purdy has made seminal contributions over a dedicated period of more than 50 years. This symposium is dedicated to Purdy on the occasion of his 80th birthday.

THERMODYNAMIC APPLICATIONS, OPTIMIZATIONS AND SIMULATIONS IN HIGH-TEMPERATURE PROCESSES



*An Extraction & Processing
Division Symposium in Honor of
Christopher W. Bale's 70th Birthday*

Dates: Monday, February 15 to
Wednesday, February 17

Location: Music City Center, Room
106C

Christopher Bale has devoted his entire career to the development of "FactSage," which is one of the thermodynamic software/database packages used widely in high-temperature processes, and to the education of the industrial and academic communities in the applications of thermodynamic calculations to industrial high-temperature processes. This symposium will be a prestigious event, attracting industrial and academic leaders in the field of high-temperature processes, stimulating discussion, and facilitating industry networking.

SPECIAL LECTURES

MONDAY, FEBRUARY 15

2016 WILLIAM HUME-ROTHERY AWARD LECTURE

Date: Monday, February 15, 8:40 a.m.

Location: Music City Center, Room 107A

*Presented as part of the Hume-Rothery Award
Symposium: Thermodynamics of Materials*



Speaker: Brent Fultz, Rawn
Professor of Materials Science and
Applied Physics, California Institute
of Technology

Lecture Title: "The Origin of
Entropy in Materials"

About the Topic: Most of the entropy of materials comes from vibrations of atoms—vibrational entropy is typically an order-of-magnitude larger than other sources, such as configurational entropy. Historically, differences in vibrational entropy between different phases have been subtle and troublesome to assess. Some trends and rules emerged over the years, such as how the formation of short, stiff bonds tends to reduce the vibrational entropy. The situation at high temperatures is complicated, but arguably more important for materials processing. At elevated temperatures, the harmonic and quasiharmonic approximations are unreliable. All materials have

phonon-phonon interactions at high temperatures because interatomic potentials are not perfectly harmonic. Metals also have electron-phonon interactions, and magnon-phonon interactions are important for iron, for example. For less-complicated materials, it is exciting that we can now measure or calculate accurately the different parts of entropy at elevated temperatures, even when the material is far from a harmonic solid.

STRUCTURAL MATERIALS DIVISION LUNCHEON LECTURE*

Date: Monday, February 15, Noon to 2:00 p.m.

Location: Omni Nashville Hotel, Legends E&F



Speaker: Michael J. Mills, Taine G. McDougal Professor of Engineering, The Ohio State University

Lecture Title: "Importance of Advanced Characterization Techniques for Understanding of

Deformation Behavior in Structural Materials"

About the Topic: The international initiative on Integrated Computational Materials Engineering holds great promise for accelerating the insertion of new materials in high performance structural applications. Achieving this aim relies upon the fidelity of materials models and their ability to capture the connectivity between processing, microstructure and performance. This presentation will focus on advancements in our ability to characterize deformation mechanisms at finer length-scales—from atomic to grain-level behavior. For instance, in the Ni-base superalloys, a surprising variety of governing mechanisms are observed as a function of microstructure and deformation condition. In particular, at elevated temperature, the strain rate and temperature dependence of deformation depends on the onset of several deformation mechanisms that are distinct from the "classic" APB shearing process that dominates at lower temperature. Using electron-microscopy-based techniques, new insights into the governing deformation mechanisms in several important structural materials are being developed. Another example to be discussed are the high-temperature shape-memory alloys for which the interplay between dislocation plasticity and martensitic transformation determines the macroscopic behavior that is highly desirable for new actuator applications. The important role played by characterization in motivating modeling at several important length-scales (including atomistic, phase field and crystal plasticity) will also be discussed.

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

FEDERATION OF EUROPEAN MATERIALS SOCIETIES (FEMS) INTERNATIONAL SCHOLAR

Date: Monday, February 15, 2:00 p.m.

Location: Music City Center, Room 213

Presented as part of the Fatigue in Materials: Fundamentals, Multiscale Modeling and Prevention Symposium



Speaker: Henry Proudhon, Centre des Matériaux, Mines ParisTech

Lecture Title: "Finite Element Simulations of Short Fatigue Crack Propagation in Three Dimensional Microstructures Obtained by X-ray

Tomography"

About the Topic: Combining in situ fatigue loading with absorption and diffraction contrast tomography, unique data sets can now be obtained to study the effect of the local microstructure on the very first stages of fatigue crack propagation. Crystal plasticity finite element simulations can now advantageously take experimental data as input to study the physical mechanisms at work. Two situations will be presented. First, the initiation of fatigue cracks on second phase particles in a commercial Al-Cu-Li alloy via 3D finite element calculations are compared to experimental observations. A criterion to assess if the crack will grow crystallographically is proposed. Second, the growth of a short fatigue crack in a beta-titanium polycrystalline sample imaged by X-ray tomography is simulated. The model uses a damage indicator to assess the local crack growth rate and direction; remeshing routines are used to achieve propagation over several grains and the results are compared to the tomographic experiment.

TUESDAY, FEBRUARY 15

EXTRACTION & PROCESSING DIVISION DISTINGUISHED LECTURER

Date: Tuesday, February 16, 2016, 9:30 a.m.

Location: Music City Center, Room 104B

Part of the REWAS 2016 Plenary Session:

Materials Matter: Deriving Value from Resource Recovery at Multiple Materials Scales



Speaker: Markus A. Reuter, Director, Helmholtz Institute Freiberg for Resource Technology, Helmholtz-Zentrum Dresden-Rossendorf

Lecture Title: "Digitalizing the Circular Economy—System-Integrated-Material-Production"

About the Topic: Metals have always been a pillar of society—presently more so than ever, as they are key to enabling our sustainability aspirations. The complex Web of Metals (WoM) is the crucial basis for enabling a sustainable Circular Economy (CE) society. Digitalization and quantification of the WoM—or Internet-of-Metallurgical-Things (IoMT)—are keys to driving CE innovation. Examples of specialized technology and flow sheet needs are presented with consideration given to a "whole of chain" or Systems-Integrated-Metal-Production (SIMP) approach.

EXTRACTION & PROCESSING DIVISION/MATERIALS PROCESSING & MANUFACTURING DIVISION JOINT LUNCHEON LECTURE*

Date: Tuesday, February 16, Noon to 2:00 p.m.

Location: Omni Nashville Hotel, Legends E&F



Speaker: David L. Bourell, Temple Foundation Professor, The University of Texas at Austin

Lecture Title: "Additive Manufacturing or 3D Printing: Origins, Applications and Future Possibilities"

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

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

YOUNG PROFESSIONAL TUTORIAL LUNCHEON LECTURE

Date: Tuesday, February 16

Luncheon: Noon to 12:45 p.m. (Tickets must be purchased in advance)

Lecture: 12:45 p.m. to 2:00 p.m. (Open to all meeting attendees)

Location: Omni Nashville Hotel, Legends D



Speaker: Elif Ertekin, University of Illinois

Lecture Title: "Introducing Innovations in Teaching While Staying on the Research Track"

About the Topic: Drawing from personal experiences, Ertekin will present a discussion on how she learned (and continues to learn) to introduce innovations in the classroom while staying on the research track. She will give some examples of what worked (and what didn't) and how it is possible not only to achieve balance, but also how to use one to improve the other.

(Young Professional Tutorial Luncheon Lecture continued on page 28.)



Speaker: Michael D. Sangid,
School of Aeronautics and
Astronautics, Purdue University

Lecture Title: "Accentuating the 'I'
in ICME"

About the Topic: Integrated
Computational Materials

Engineering (ICME) is quietly revolutionizing materials science. The coordinated efforts of national ICME initiatives aim to deliver the required infrastructure and training to accelerate innovation, discovery, development, validation, and use of advanced materials and manufacturing processes as an integral part of next-generation multi-disciplinary design with a focus on designing for affordability. A primary barrier to the widespread deployment of ICME efforts is the integration of these practices within the design systems, structural analysis, and manufacturing communities. We are past the days of doing research and throwing it over the wall. This luncheon will serve as an open discussion on opportunities to share our materials knowledge, research, and tools with a wider audience, including engineers from other disciplines representing design, structures, manufacturing, and optimization.

WEDNESDAY, FEBRUARY 17

LIGHT METALS DIVISION LUNCHEON LECTURE*

Date: Wednesday, February 17, Noon to 2:00 p.m.

Location: Omni Nashville Hotel, Legends E&F



Speaker: Gregory R. Wittbecker,
Vice President—Industry Analysis,
Alcoa Global Primary Products

Lecture Title: "2016 Aluminum
Fundamentals: A Producer's View"

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

THURSDAY, FEBRUARY 18

JAPAN INSTITUTE OF METALS INTERNATIONAL SCHOLAR

Date: Thursday, February 18, 9:40 a.m.

Location: Music City Center, Room 107

*Presented as part of the Phase Transformations
and Microstructural Evolution Symposium*



Speaker: Motomichi Koyama,
Department of Mechanical
Engineering, Kyushu University

Lecture Title: "Effective Utilization
of ϵ -Martensite in Fe-High Mn
Austenitic Steels: Aspects of
Deformation-Induced Reverse

Transformation"

About the Topic: ϵ -martensite in high Mn austenitic steels has been reported to cause brittle cracking, deteriorating mechanical properties. However, in some specific conditions, ϵ -martensite plays crucial roles on improvement of low-cycle fatigue resistance, uniform elongation, and yield/tensile strength. A key phenomenon to positively utilize ϵ -martensite is deformation-induced reverse transformation from ϵ -martensite to austenite. For instance, reversible deformation-induced ϵ -martensitic transformation like twinning/detwinning suppresses damage accumulation during low-cycle fatigue, drastically improves fatigue life. Furthermore, reversely-transformable pre-existing ϵ -martensite increases yield/tensile strength without any deterioration of elongation. These phenomena can be interpreted by thermodynamics and crystallographic similarity to mechanical twinning.



Refractory competence for the nonferrous metal industry

**We look forward to meeting
you at TMS 2016, booth 508!**

RHI is the leading global partner for the nonferrous metal industry.

We offer a complete programme comprising outstanding products and services ranging from basic and nonbasic bricks as well as monolithics, prefabricated products, slide gate plates, and gas purging plugs.

Customers can rely on our state of the art, all-inclusive solutions for processes, lining concepts, special machinery, and repair systems as well as computer simulations including CFD or FEM to support metallurgical process and furnace integrity improvements.

www.rhi-ag.com EXCELLENCE
IN REFRACTORIES

RHI

NETWORKING, STUDENT & SOCIAL EVENTS

SUNDAY, FEBRUARY 14

TMS2016 MATERIALS BOWL



Date: Sunday, February 14

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

Championship Round: 6:30 p.m. to 7:00 p.m.

Location: Music City Center, Davidson Ballroom B
Open to all attendees

Celebrating its 10th Anniversary! Even if you aren't competing in this materials-themed quiz-show competition, you are welcome to attend the elimination rounds or the final championship round. Play along to test your knowledge of minerals, metals, and materials science and engineering or to cheer on your favorite school.

TMS2016 OPENING CELEBRATION

Date: Sunday, February 14

Time: 5:00 p.m. to 6:30 p.m.

Location: Music City Center, Davidson Ballroom A
Open to all attendees

Kick off the TMS 2016 Annual Meeting & Exhibition with this social networking event. Refreshments will be provided.

STUDENT NETWORKING MIXER



Date: Sunday, February 14

Time: 7:00 p.m. to 9:00 p.m.

Location: Music City Center, Davidson Ballroom C
Open to all attendees

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

MONDAY, FEBRUARY 15

WOMEN IN MATERIALS SCIENCE & ENGINEERING BREAKFAST



Date: Monday, February 15

Time: 7:00 a.m. to 8:00 a.m.

Location: Music City Center, Davidson Ballroom C1-C2

Tickets Required

Sponsored by **RioTinto**

Organized by the TMS Diversity Committee, this annual event offers an opportunity for TMS members to network and discuss issues specific to women in the science and engineering professions. For 2016, this event includes a hot breakfast buffet, thanks to sponsor Rio Tinto.

MEET A MENTOR



Date: Monday, February 15

Time: 4:30 p.m. to 6:00 p.m.

Location: Omni Nashville Hotel, Legends D
Pre-Registration Required

This event matches mentors and mentees for scheduled meetings in an informal atmosphere.

NETWORKING, STUDENT & SOCIAL EVENTS

PRESIDENT'S WELCOMING RECEPTION



Date: Monday, February 15

Time: 5:00 p.m. to 6:30 p.m.

Location: Music City Center, Hall B

All attendees are invited to meet in the exhibit hall for appetizers, beverages, and networking with exhibitors and other colleagues. Music will be provided by Craig Duncan & Friends, a Nashville-based trio that plays traditional Tennessee and authentic bluegrass music.

YOUNG PROFESSIONAL HAPPY HOUR RECEPTION

Date: Monday, February 15

Time: 6:00 p.m. to 7:00 p.m.

Location: Omni Nashville Hotel, Legends B

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

"MEET THE CANDIDATE" INTERACTIVE SESSION

Date: Monday, February 15

Time: 6:30 p.m. to 8:30 p.m.

Location: Music City Center, Hall C

Graduate students, postdocs, and early career professionals display their qualifications—not just their current research—at a special poster session sponsored by the TMS Young Professional Committee. This event allows young professionals to network with employers looking for high-caliber personnel for positions in national laboratories, academia, and industry.

TUESDAY, MARCH 17

STUDENT CAREER FORUM

Date: Tuesday, February 16

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

Location: Omni Nashville Hotel, Legends B

Organized by the TMS Young Professional Committee, this session will feature speakers from various stages of their careers and diverse materials science backgrounds to discuss how to navigate a successful career path in the fields of minerals, metals, and materials.

EXHIBIT HALL HAPPY HOUR

Date: Tuesday, February 16

Time: 4:30 p.m. to 5:30 p.m.

Location: Music City Center, Hall B

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



TMS2016 AWARDS CEREMONY AND BANQUET

SCHEDULE OF EVENTS*

Reception: 6:00 p.m.

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

Dinner: 7:45 p.m.

Entertainment to follow dinner

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



MUSIC CITY CENTER
TUESDAY
FEBRUARY 16
2016
DAVIDSON
BALLROOM
LEVEL IM

RECOGNIZING EXCELLENCE IN MINERALS, METALS, AND MATERIALS

The 2016 TMS-AIME Awards Ceremony and Banquet will be an elegant event, designed to honor the significant professional achievements of members of the minerals, metals, and materials communities. The ceremony includes presentations of awards from both TMS and the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME), of which TMS is a member society. Additional awards, including two from Acta Materialia, will also be presented to TMS members during this ceremony.

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

BANQUET ENTERTAINMENT

Following dinner, attendees will be treated to a performance by Jon Randall and Jessi Alexander, a pair of singer/songwriters from Nashville, Tennessee.

Jon Randall earned a Grammy award as part of Emmylou Harris's band, the Nash Ramblers, and has since released four studio albums. As a songwriter, Randall has had songs cut by some of

Nashville's top artists including Brad Paisley and Alison Krauss who recorded the Grammy-nominated song "Whiskey Lullaby" in 2005. Randall has toured and recorded for Lyle Lovett, Patty Loveless, Mary Chapin Carpenter, Trisha Yearwood, Earl Scruggs, and Kid Rock among others. He recently co-wrote the two-week No. 1 "Drink on It" for Blake Shelton and "Am I the Only One" for Dierks Bentley.

Jessi Alexander released her debut album, *Honeysuckle Sweet*, in 2005. Today, she is one of Nashville's most prolific and successful songwriters. She has continued to dominate the charts with cuts including Reba McEntire's "When Love Gets A Hold Of You" and Blake Shelton's hits "Drink On It" (which spent two weeks at #1) and "Mine Would Be You" (which spent three weeks at #1).

INSTALLATION OF THE 2016 TMS PRESIDENT STANLEY M. HOWARD



During the 2016 TMS-AIME Awards Banquet, TMS will install Stanley M. Howard, professor of materials and metallurgical engineering at the South Dakota School of Mines and Technology (SDSM&T), as the society's 2016 president. Howard has served on the TMS Executive Board, TMS Board of Directors as the TMS Financial Planning Officer, and currently serves on the TMS Foundation Board of Trustees. He received his B.S. and Ph.D. in metallurgical engineering from the Colorado School of Mines and is a licensed professional engineer.



TMS has been Howard's professional society home throughout his career. He became a member as a student and has served TMS on many committees including Nominating, Professional Registration, Audit, Retirement, Waste Minimization and Recycling, Education, Physical Chemistry of Extractive Processes, Student Affairs, and EPD Publications. He has also served on the Board of Directors of Alpha Sigma Mu, the EPD Scholarship Selection Committee, and the AIME's Hoover Award Selection Committee.

Howard has held leadership and service positions at his university, including chair of the Department of Materials and Metallurgical Engineering, Faculty Senate Chair and Chair of the Faculty, and Material Advantage Advisor. He is a recipient of the AIME Mineral Industry Education Award and the SDSM&T Presidential Award for Outstanding Service; former president of Group V Metals, a technology services and licensing company; and a volunteer in numerous community organizations. Howard has received visiting faculty appointments to Oak Ridge National Laboratory, Stanford Research Laboratory, and Kerr-McGee Technical Center; served as a technical auditor on the Yucca Mountain Nuclear Waste Repository; holds

patents on beryllium replacement alloys; and has provided technical consultation for industrial firms, universities, and governmental agencies.

2016 TMS-AIME AWARDS CEREMONY PRESENTERS

The ceremony will be hosted by **James J. Robinson**, TMS executive director, and will include comments from **Patrice Turchi**, 2015 TMS president, and **Stanley Howard**, 2016 TMS president. In addition, some of the society's most esteemed members present the awards:

- **Garry Warren**, president of AIME, and **Michele Lawrie-Munro**, executive director of AIME, will present the AIME Awards.
- **Carolyn Hansson**, University of Waterloo, and **George "Rusty" Gray III**, Los Alamos National Laboratory, will present the Acta Materialia Awards.
- **Julie Christodoulou**, Office of Naval Research, will present the Student and Mid-Career Awards.
- **Iver Anderson**, Iowa State University, will present the TMS Elite Awards.
- **Jeffrey Wadsworth**, Battelle Memorial Institute, will present the TMS Fellow Awards.

SOCIETY AWARDS

Fellow Award—Class of 2016

Brajendra Mishra

Professor, Worcester Polytechnic Institute

G. Robert Odette

Professor, University of California, Santa Barbara

George Pharr

Professor, University of Tennessee

Ian Robertson

Professor, University of Wisconsin

James Smialek

Senior Research Scientist, NASA

Bruce Wessels

Professor, Northwestern University

Brimacombe Medalist—Class of 2016

David Bahr

Head and Professor, Purdue University

Carelyn Campbell

Leader, Thermodynamics and Kinetics Group, National Institute of Standards and Technology

Xingbo Liu

Professor and Associate Chair for Research, West Virginia University

James Yurko

Director of Materials Engineering, Silicon Valley Consumer Products Company

Application to Practice Award

Guanghai Lang

Board Chair, Sunstone Development Co. Ltd.

Bruce Chalmers Award

Michael Aziz

Professor, Harvard University

Morris Cohen Award

Gerbrand Ceder

Chancellor's Professor of Materials Science and Engineering, University of California, Berkeley

Early Career Faculty Fellow Award

Elif Ertekin

Assistant Professor, University of Illinois

Michael Sangid

Assistant Professor, Purdue University

Educator Award

Challapalli Suryanarayana

Professor, University of Central Florida

William Hume-Rothery Award

Brent Fultz

Professor, California Institute of Technology

Leadership Award

Enrique Lavernia

Dean and Distinguished Professor, University of California, Irvine

Alexander Scott

Distinguished Service Award

Tirumalai "Sri" Srivatsan

Professor, University of Akron

Cyril Stanley Smith Award

Carlos Tomé

Technical Staff Member, Los Alamos National Laboratory



2016 TMS-AIME AWARDS CEREMONY

AIME AWARDS

AIME Honorary Membership

Siegfried Hecker

Director, Los Alamos National Laboratory

AIME-EPD James Douglas Gold Medal

Daniel Kappes

President, Kappes, Cassiday & Associates

AIME Robert Lansing Hardy Award

Edouard Asselin

Professor, University of British Columbia

AIME Champion H. Mathewson Award

Laura Bartlett

Assistant Professor, Texas State University

Dieter Isheim

Research Assistant Professor, Northwestern University

Julia Medvedeva

Associate Professor, Missouri University of Science and Technology

Nadezhda Medvedeva

Leading Researcher, Institute of Solid State Chemistry

Kai Song

Senior Applications Engineer, FEI Company

David Van Aken

Curators' Teaching Professor, Missouri University of Science and Technology

AIME Rossiter W. Raymond Memorial Award

William Joost

Technology Development Manager, U.S. Department of Energy

AIME Henry DeWitt Smith Scholarship

Jessica Buckner

Student, University of Texas

Janet Gbur

Student, Case Western Reserve University

ACTA MATERIALIA AWARDS

Acta Materialia Gold Medal Award

Sungho Jin

Professor Emeritus, University of California, San Diego

Acta Materialia Hollomon Materials & Society Award

Julie Schoenung

Professor, University of California, Davis

EXTRACTION & PROCESSING DIVISION (EPD) AWARDS

Distinguished Lecturer

Markus Reuter

Director and Professor, Helmholtz-Zentrum Dresden-Rossendorf, Helmholtz Institute Freiberg for Resource Technology

Pyrometallurgy Best Paper Award

Nikolaos Tzouganatos

Paul Scherrer Institute

Mark Dell'Amico

Consultant

Christian Wieckert

Project Leader, Paul Scherrer Institute

Jim Hinkley

Senior Research Scientist, CSIRO Energy Technology

Aldo Steinfeld

Professor, ETH Zurich

Science Award

Metallurgical and Materials Transactions A

Mahmoud Abdellatif, Materials Science—Beamline Scientist, SESAME

Andrea Lausi

Head MCX Beamline, Elettra-Sincrotrone Trieste

Jasper R. Plaisier

Researcher MCX Beamline, Elettra-Sincrotrone Trieste

Paolo Scardi

Professor, University of Trento

Science Award

Metallurgical and Materials Transactions B

Subrata Roy

Metallurgist, New Gold

Hamidreza Zebardast

Corrosion Engineer, Acuren

Edouard Asselin

Professor, University of British Columbia

Technology Award

Ashutosh Sharma

Institute Chair Professor & C.V. Seshadri Chair Professor, Indian Institute of Technology Kharagpur

Sumit Bhattacharya

Student, Northwestern University

Siddhartha Das

Professor, Indian Institute of Technology, Kharagpur

Karabi Das

Professor, Indian Institute of Technology, Kharagpur

FUNCTIONAL MATERIALS DIVISION (FMD) AWARDS

John Bardeen Award

Ilesanmi Adesida

Professor, University of Illinois

Distinguished Scientist/Engineer Award

Nikhilesh Chawla

Professor, Arizona State University

Vincent Harris

Distinguished Professor and W.L. Smith Chair, Northeastern University

LIGHT METALS DIVISION (LMD) AWARDS

Light Metals Award

Nan Zhang

Student, Clemson University

Fadi Abu-Farha

Assistant Professor, Clemson University

Distinguished Service Award

Stephen Lindsay

Manager, Process Technology, Alcoa Inc.

Technology Award

Ray Peterson

Technology Director, Real Alloy

Energy Best Paper Award - Professional

Lejun Zhou

Lecturer, Central South University

Wanlin Wang

Director, Central South University

Kechao Zhou

Central South University

Energy Best Paper Award - Student

Zuotai Zhang

Professor, Peking University

Yongqi Sun

Student, Peking University

JOM Best Paper Award

David Wong

Project Manager, University of Auckland

Pascal Lavoie

Chief Engineer, University of Auckland

Paul Fraser

Research Fellow, CSIRO Oceans and Atmosphere

Jooil Kim

Scripps Institution of Oceanography

Light Metals Subject Award - Alumina & Bauxite

Peter-Hans ter Weer

Director, TWS Services & Advice BV

Light Metals Subject Award - Aluminum Reduction Technology

Zhao ZhiBin

Student, Northeastern University

Yuqing Feng

Senior Research Scientist, CSIRO



Bing-liang Gao

Professor, Northeastern University

Zhao-wen Wang

Professor, Northeastern University

Zhong-ning Shi

Professor, Northeastern University

Xianwei Hu

Associate Professor, Northeastern University

Light Metals Subject Award - Electrode Technology for Aluminum Production

Winfried Boenigk

Head of R&D, RÜTGERS Basic Aromatics GmbH

Claudia Boltersdorf

RÜTGERS Basic Aromatics GmbH

Christopher Kuhnt

Project Manager, RÜTGERS Basic Aromatics GmbH

Jens Stiegert

Director of Sales, RÜTGERS Basic Aromatics GmbH

Les Edwards

Chief Technology Officer, RAIN CII Carbon LLC

Marvin Lubin

Customer Tech Support Manager, RAIN CII Carbon LLC

Light Metals Subject Award - Recycling

Bingyi Song

Student, Kunming University of Science and Technology

Wenlong Jiang

Kunming University of Science and Technology

Bin Yang

Kunming University of Science and Technology

Baoqiang Xu

Kunming University of Science and Technology

Qitong Yang

Kunming University of Science and Technology

Shuai Xu

Kunming University of Science and Technology

Dachun Liu

Kunming University of Science and Technology

Light Metals Subject Award - Warren Peterson Cast Shop for Aluminum Production

Robert Fritzsch

Student, Norwegian University of Science and Technology

Mark Kennedy

Chief Technology Officer, Proval Partners SA

Shahin Akbarnejad

Ph.D. Fellow, Royal Institute of Technology

Ragnhild E. Aune

Professor, Norwegian University of Science and Technology

Magnesium Technology Best Paper Award - Application

Piotr Korczak

Assistant, Institute of Non-Ferrous Metals

Bartłomiej Płonka

Head of the Light Metals Processing Plant, Institute of Non-Ferrous Metals

Dariusz Lezniak

Professor, AGH University of Science & Technology

Marek Nowak

Head of the Laboratory of Corrosion and Surface Engineering, Institute of Non-Ferrous Metals

Krzysztof Remsak

Engineering and Technical Specialist, Institute of Non-Ferrous Metals

Sonia Boczkal

Lecturer, Institute of Non-Ferrous Metals

Magnesium Technology Best Paper Award- Fundamental Research

Taisuke Sasaki

Researcher, National Institute for Materials Science

Tilak Bhattacharjee

University of Kyoto

Byeong Chan Suh

National Institute for Materials Science

Taiki Nakata

Student, Nagaoka University of Technology

Shigeharu Kamado

Professor, Director for RCAMT, Nagaoka University of Technology

Nack Joon Kim

Professor, Pohang University of Science & Technology

Kazuhiro Hono

NIMS Fellow and Director of Magnetic Materials Center, National Institute for Materials Science

Magnesium Technology Student Paper Award

Jishnu Bhattacharyya

Student, University of Virginia

Sean Agnew

Associate Professor, University of Virginia

Peidong Wu

Professor, McMaster University

Wilburn Whittington

Research Associate, Mississippi State University

Haitham El Kadiri

Assistant Professor, Mississippi State University

Magnesium Technology Best Poster Award

Sivanesh Palanivel

Graduate Research Assistant, University of North Texas

Rajiv S. Mishra

Professor, University of North Texas

Raymond Brennan

Materials Engineer, U.S. Army Research Laboratory

Kyu C. Cho

Materials Engineer, U.S. Army Research Laboratory

MATERIALS PROCESSING & MANUFACTURING DIVISION (MPMD) AWARDS

Distinguished Service Award

Amit Misra

Professor, University of Michigan

STRUCTURAL MATERIALS DIVISION (SMD) AWARDS

Distinguished Scientist/Engineer Award

Nikhilesh Chawla

Professor, Arizona State University

Distinguished Service Award

Raul Rebak

Corrosion and Materials Scientist, GE Global Research

JOM Best Paper Award

G. Robert Odette

Professor, University of California

YOUNG PROFESSIONAL AWARDS

EPD Young Leaders Professional Development Awards

Laura Bartlett

Assistant Professor, Texas State University

Alexander Senaputra

Application Chemist, Cytec Industries

Tao Wang

Metallurgical Engineer, Nucor Steel

FMD Young Leaders Professional Development Awards

Babak Arfaei

Research Assistant Professor, Universal Instruments

Vincenzo Lordi

Lawrence Livermore National Laboratory

Partha Mukherjee

Scientist, Texas A&M University



2016 TMS-AIME AWARDS CEREMONY

Tolou Shokuhfar

Associate Professor, University of Illinois

Luisa Whittaker-Brooks

Assistant Professor, University of Utah

Yu Zhong

Florida International University

LMD Young Leaders Professional Development Awards

Nadia Ahli

Lead Engineer, Process Development, Emirates Global Aluminium

Mehul Bhatia

Postdoctoral Researcher, Arizona State University

Jan-Marten Seitz

Project Manager and R&D Specialist, Syntellix AG

MPMD Young Leaders Professional Development Awards

Marko Knezevic

Postdoctoral Fellow, New Hampshire University

Samantha Lawrence

Postdoctoral Appointee, Sandia National Laboratories

Soumya Nag

Metallurgist, General Electric

Garritt Tucker

Assistant Professor, Drexel University

Christopher Weinberger

Assistant Professor, Drexel University

SMD Young Leaders Professional Development Awards

Lauren Garrison

Weinberg Fellow, Oak Ridge National Laboratory

E-Wen Huang

Assistant Professor, National Chiao Tung University

Eun Soo Park

Professor, Seoul National University

Reza Shahbazian-Yassar

Assistant Professor, University of Illinois

Julie Tucker

Assistant Professor, Oregon State University

Natasha Vermaak

Assistant Professor, Lehigh University

TMS/JIM Young Leaders International Scholar

Saryu Fensin

Postdoctoral Researcher, Los Alamos National Laboratory

Federation of European Materials Society Young Leader

Henry Proudhon

Research Associate, MINES Paristech, Centre des Matériaux

Japan Institute of Metals Young Leader

Motomichi Koyama

Assistant Professor, Kyushu University

STUDENT AWARDS

J. Keith Brimacombe Presidential Scholarship

Ivan Au

University of Alberta

EPD Scholarships

Maureen Chorney

Montana Tech of the University of Montana

Jordan Dick

South Dakota School of Mines and Technology

Mark Mazzucco

South Dakota School of Mines and Technology

Kerry McQuaid

Colorado School of Mines

FMD Gilbert Chin Scholarship

Ziyin Huang

Drexel University

LMD Scholarships

Daniel Balder

University of Minnesota

Cory Potter

University of Alabama at Birmingham

Hannah Woods

Purdue University

MPMD Scholarships

Bill Nguyen

Drexel University

Gregory Strader

University of Utah

SMD Scholarships

Rebecca Stern

University of Connecticut

TMS Best Paper Contest: Graduate Division

First Place:

Zhiqian Sun

University of Tennessee

Second Place:

Gian Song

University of Tennessee

OFFICERS:

EXECUTIVE COMMITTEE

2015 President

Patrice E.A. Turchi

Scientific Capability and Group Leader, Lawrence Livermore National Laboratory

2015 Vice President/Incoming 2016 President

Stanley M. Howard

Materials and Metallurgical Engineering Professor, South Dakota School of Mines and Technology

Incoming 2016 Vice President

David H. DeYoung

Director, Global Primary Products Business Technology, Alcoa

Past President

Hani Henein

Professor and Director of the Advanced Materials and Processing Laboratory, University of Alberta

Financial Planning Officer

Joy Forsmark

Technical Expert, Light Cast Metals, Ford Motor Company

FUNCTIONAL AREA DIRECTORS

Membership & Student Development

Amy J. Clarke

Scientist, Los Alamos National Laboratory

Programming

Srinivas Chada

Component Packaging Engineer, Schlumberger HFE

Professional Development

Jeffrey Fergus

Professor, Auburn University

Content Development & Dissemination

Eric N. Brown

Explosive Science and Shock Physics Division Leader, Los Alamos National Laboratory

Public & Governmental Affairs

Edward D. Herderick

Additives Technologies Leader, GE Corporate

TECHNICAL DIVISION DIRECTORS

Extraction & Processing Division

Mark Schlesinger

Professor, Missouri University of Science and Technology

Functional Materials Division

Roger Narayan

Associate Professor, University of North Carolina

Light Metals Division

David H. DeYoung

Director, GPP Business Technology, Alcoa Inc.

Incoming Light Metals Division

Alan A. Luo

Professor, Materials Science and Engineering, and Professor, Integrated Systems Engineering, The Ohio State University

Materials Processing & Manufacturing Division

James C. Foley

R&D Manager, Los Alamos National Laboratory

Incoming Materials Processing & Manufacturing Division

Corbett C. Battaile

Principal Member, Technical Staff, Sandia National Laboratories

Structural Materials Division

Rajiv S. Mishra

Professor, University of North Texas

Incoming Structural Materials Division

Ellen K. Cerreta

Group Leader, Materials in Radiation and Dynamic Extremes Group, Los Alamos National Laboratory

Collected Proceedings

Individual Volumes for Purchase

- 7th International Symposium on High-Temperature Metallurgical Processing
- CFD Modeling and Simulation in Materials Processing 2016
- Characterization of Minerals, Metals, and Materials 2016
- Energy Technology 2016: Carbon Dioxide Management and Other Technologies
- EPD Congress 2016
- Light Metals 2016
- Magnesium Technology 2016
- Rare Metal Technology 2016
- REWAS 2016
- Shape Casting: 6th International Symposium
- TMS 2016 Supplemental Proceedings



For more information on TMS publications, visit www.tms.org/publications.

PLAN TO ATTEND!

ELECTROMETALLURGY 2016 2ND INTERNATIONAL SYMPOSIUM



September 11–15, Québec City Convention Center

The 2nd International Symposium on Electrometallurgy – building on the previous Symposium in Orlando, Florida (2012), will bring together industry, consulting engineers and researchers.

This symposium is held within the Conference of Metallurgists hosted by IMPC 2016.

Topics discussed at the symposium:

- Electrefining: Improving productivity electrolyte control and by-product recovery
- Electrowinning: Impurity effects and deposit control
- Electrowinning: Anode technology
- Molten Salt Electrometallurgy: New and future applications
- Electrometallurgy: Innovative Applications
- Electrochemical Technologies and Fundamentals for Metals, Minerals, and Materials
- Electrochemical treatment of effluents
- Process Modelling and optimization
- Emerging Technologies

**This Symposium is organized by MetSoc of CIM
and co-organized by TMS.**

SHORT COURSE ON ELECTROMETALLURGY

A one day short course will be offered before the Symposium on Saturday, Sept. 10 that will cover presentations on the fundamentals and practices of Electrometallurgy.

TECHNICAL TOUR

A one-day tour to Canadian Copper Refinery and Canadian Electrolytic Zinc is planned for COM 2016-IMPC2016. Please visit our website for updates.

ABOUT THE CONGRESS



XXVIII | Québec City, Canada

IMPC 2016

The IMPC has been a major driving force for the promotion of scientific and technical knowledge in mineral processing and extractive metallurgy across the globe, becoming the most prestigious event in its field in the world today.



**What to expect
at IMPC 2016?**

**TRANSFORMATIONAL
TECHNICAL PROGRAM**

FOUR-DAY CONGRESS

DAILY THEMED PLENARIES

16 TECHNICAL TOPICS + **8** SHORT COURSES + **INDUSTRIAL TOURS**

600 ORAL PRESENTATIONS

150 POSTERS

70 EXHIBITORS

1000 PARTICIPANTS

**VAST NETWORKING
& BUSINESS OPPORTUNITIES**

NETWORK WITH PEERS AND PARTNERS

REGISTRATION OPENS SPRING 2016

com2016.metsoc.org

Get Some Satisfaction

Own the guitar autographed by the current lineup of the Rolling Stones. It's up for bid—along with other pieces of pop culture history.



(Located at the Exhibit Hall entrance)

Monday, February 15
2:00 p.m. to 6:30 p.m.

Tuesday, February 16
10:00 a.m. to 5:30 p.m.

Wednesday, February 17
10:00 a.m. to Noon

Here's just a sampling of what you can bid on, while making sure future generations benefit from the TMS Foundation's student scholarships and young professional programs.

Star Wars



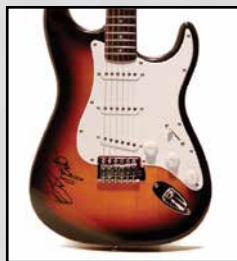
- Autographed *Star Wars: The Force Awakens* Movie Poster
- Autographed *Star Wars* Masterpiece: Episodes I–VI Poster

Television



- Autographed *Star Trek* (Original Series) Cast Photo
- Autographed *The Big Bang Theory* Cast Photo
- Bart Simpson Sketch Autographed by Matt Groening

Music



- Guitar Autographed by Bruce Springsteen
- Vinyl Albums Autographed by Paul McCartney and Ringo Starr, Bob Dylan, and Johnny Cash

Movies



- Poster Autographed by Six *James Bond* Actors
- Autographed *Harry Potter* Series Cast Poster
- Autographed *Nightmare Before Christmas* Movie Poster

Not interested in memorabilia? How about luxury vacations or one-of-a-kind handcrafted items donated by TMS members?

Visit www.tms.org/TMS2016Auction for details on each item.

Enjoy browsing and good luck bidding!



MECFOR & Brochot

The combined expertise and specific know-how of
two renown aluminium industry suppliers

**Visit us at
TMS2016
Booth 519**

300

Specialized Vehicles
(AGV, LTV, BTV, Tilters,
Cashouse vehicles)

130

Pot Ramming
Machines

40

Complete Anode Rodding
shops and Anode
handling systems

25

Anode Slot
Cutting Machines

Delivered to primary smelters
and secondary plants worldwide.



Richard A. Zalzal

Vice President, International Sales
zalzal.richard@mecfor.com

Rafael Castellano

Sales Director, USA & Northern Europe
castellano.rafael@mecfor.com

JeanPhilippe Villain

Director, Brochot Products & Services
villain.jeanphilippe@mecfor.com

Michael Guernonprez

Vice President, Business Development
guernonprez.michael@mecfor.com

NEW!



Alumina ♦ Fused Quartz ♦ Zirconia ♦ Sapphire

Crucibles ♦ Furnace Tubes ♦ Thermocouple Insulators

Rods ♦ Plates & Disks ♦ Quartz Cuvettes

Alumina & Sapphire Sample Pans for Thermal Analysis

Custom Components

VISIT US AT BOOTH 337

ADVALUE TECHNOLOGY

3470 S. Dodge Blvd., Tucson, AZ 85713

Tel: 520-514-1100 ♦ Fax: 520-747-4024

sales@advaluetech.com ♦ www.advaluetech.com



AdValue Technology

**24-hour Shipment of Many In-stock Standard Sizes
Custom Fabrication for Special Requests**