

TMS 2015

144th Annual Meeting & Exhibition

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



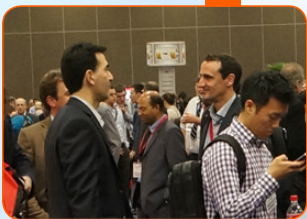
*Connecting the global minerals,
metals, and materials community.*



PROGRAM PREVIEW



**Register today at
www.tms.org/TMS2015/AB**



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TMS2015

144th Annual Meeting & Exhibition

Connecting the global minerals, metals, and materials community.

Join Us!

More than 4,000 scientists and engineers from the minerals, metals, and materials community will gather at the TMS 2015 Annual Meeting & Exhibition. At this event, The Minerals, Metals & Materials Society (TMS) provides a forum where experts in a variety of fields can share research, network, and grow professionally.

What You Can Do at TMS2015

- Learn from the research of your peers at 70 technical symposia
- Forge relationships with potential collaborators at networking events
- Build strong business contacts in the exhibit hall
- Gain knowledge from expert instructors at professional development courses
- Make new friends and connect with old ones at social events

Who Attends

Scientists and engineers working in industry, academia, and government from nearly 70 countries attend the TMS Annual Meeting & Exhibition each year. They represent all areas of the minerals, metals, and materials community and all phases of career development, from students and young professionals to experienced professionals and retired experts.

What Your Registration Package Includes

By registering for TMS2015, you'll receive access to:

- More than 3,000 technical presentations delivered at 70 symposia
- Featured keynotes, honorary symposia, special award lectures, and all poster sessions
- A three-day pass to the TMS2015 Exhibit
- Electronic access to the complete collected proceedings
- TMS2015 Opening Celebration
- President's Welcome Reception
- Exhibit Hall Happy Hour
- 2015 TMS-AIME Awards Ceremony

How to Register

Register by **February 9, 2015**, to receive the discounted advance registration rate. Online registration and printable registration forms are available at www.tms.org/TMS2015/AB.

Registration Fees

Type	Before February 9	After February 9
Member	\$595	\$730
Nonmember Presenter*	\$745	\$880
Nonmember*	\$780	\$915
Senior Member	\$425	\$560
Student Member	\$100	\$125
Student Nonmember*	\$130	\$155
Daily Registration Member	\$415	\$470
Daily Registration Nonmember*	\$460	\$515
Exhibit Daily Only	\$50	\$50

* Register as a nonmember and your registration will include 2015 membership in The Minerals, Metals & Materials Society. For student nonmembers, registration will include 2015 Material Advantage membership.

Proceedings

Free online access to TMS 2015 Annual Meeting & Exhibition proceedings content will be provided to attendees in all registration classes. Approximately one week prior to the meeting, preregistered attendees will receive information on how to download proceedings content. The Collected Proceedings are also available to meeting registrants for \$50 on one DVD through the TMS2015 registration form.

Housing

Activities and programming at the TMS 2015 Annual Meeting & Exhibition will be held at the Walt Disney World Swan and Dolphin Resort (the TMS headquarters hotel) and at Disney's Yacht & Beach Convention Center. TMS has reserved room blocks for attendees at these hotels, as well as at Disney's Caribbean Beach Resort and Disney's Coronado Springs Resort.

Book a hotel room for your stay through Travel Planners, the official TMS2015 reservation service, for the best rates with no booking or service fees. The deadline to book housing is **February 10, 2015**, so make your reservations early to guarantee a room at the hotel of your choice.

Technical Programming

A strong technical program lies at the core of the TMS 2015 Annual Meeting & Exhibition. The meeting will present 70 symposia covering a wide range of topics related to minerals, metals, and materials and featuring more than 3,000 individual presentations by scientists and engineers from around the world. The symposia are divided into the following technical tracks, to show attendees the range of topics covered by this meeting:

- Additive Manufacturing and Joining Processes
- Advanced Characterization of Materials
- Advanced Materials, Properties and Performance
- Advances in Processing and Fabrication
- Extraction and Processing
- Functional Materials and Nanomaterials
- ICME and Computational Modeling
- Light Metals
- Materials for Energy and Sustainability
- Nuclear Reactor Materials and Fuels
- Special Sessions

FOCUS ON SUSTAINABILITY

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



A Special Symposium Planned for TMS2015

With impending and burgeoning societal issues affecting both developed and emerging nations, the global engineering community has a responsibility and an opportunity to truly make a difference and contribute. This symposium will focus on what materials and resources are integral to meeting basic societal sustainability needs in critical areas of energy, transportation, housing, and recycling.

Keynote Presentations

Light Metals Keynote Session

Latest Developments in Smelting of Light Metals

Three smelting processes dominate the production of light metals:

- The Hall-Heroult cell for aluminium
- The Kroll process for titanium
- The Pidgeon process for magnesium

In each case the original inventors felt these processes would be superseded. This has not happened despite much research effort over the years. At this session, presenters will review the status of the latest programs and developments in potential alternative processes and share these developments across the research community of all three light metals.

Speakers will include:

- **John Grandfield**, Grandfield Technology Pty Ltd, Australia, Session Chair
- **Jim Metson**, University of Auckland and Ministry of Business Innovation and Employment, New Zealand
- **James Klausner**, University of Florida and U.S. Department of Energy Advanced Research Projects Agency-Energy (ARPA-E), USA
- **Aldo Steinfeld**, ETH Zurich and Paul Scherrer Institute, Switzerland
- **Kathie McGregor**, CSIRO Process Science and Engineering, Australia
- **Zak Fang**, University of Utah, USA
- **James Sever**, Nevada Clean Magnesium, USA
- **Mark Cooksey**, CSIRO, Australia
- **Per Bjørn Engseth**, Silmag Production AS
- **Asuncion Arandda**, Institute for Energy Technology- IFE, Norway

Magnesium Technology Symposium Keynote

“Reducing Weight for Transportation Applications: Technology Challenges and Opportunities”



Alan Taub, Chief Technical Officer, American Lightweight Materials Manufacturing Innovation Institute; Professor, University of Michigan

Honorary Symposia

Advances in the Science and Engineering of Casting Solidification

A Materials Processing & Manufacturing Division Symposium Honoring Doru Michael Stefanescu

Constitutive Response and Modeling of Structural Materials

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

Micromechanics of Structurally Inhomogeneous Materials

A Functional Materials Division Symposium in Honor of Armen Khachaturyan

Memorial Symposium

MHD 2015

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

Award Lectures



2015 William Hume-Rothery Award Lecture

"Solidification of Multicomponent Alloys"

William Boettinger, National Institute of Standards and Technology (NIST)



Extraction & Processing Division Distinguished Lecturer

"Green Technology for Metals Production"

Uday B. Pal, Boston University



Institute of Metals/Robert Franklin Mehl Award

"The Role of Materials Science in Microelectronics: Past, Present, and Future"

Subhash Mahajan, University of California, Davis

Division Luncheon Lectures



Light Metals Division Luncheon Lecture

"The Role of the National Network of Manufacturing Institutes in Improving U.S. Manufacturing Competitiveness"

Alan Taub, Chief Technical Officer, American Lightweight Materials Manufacturing Innovation Institute; Professor, University of Michigan



Structural Materials Division Luncheon Lecture

"Additive Manufacturing: Origins, Applications and Future Possibilities"

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

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

Ed McGowan, Director, Safety, Health and Environmental, FLSmidth

Plan Your Meeting Now



A preliminary technical program for TMS2015 will be available online in late-November. Begin building your schedule for the meeting now at ProgramMaster.org. Any schedule you build now through ProgramMaster will be compatible with the TMS2015 Mobile App, to be released early 2015.

Networking Events



Make new connections and meet up with old friends at the meeting's networking and social events, including:

- **TMS2015 Opening Celebration**
- **President's Welcome Reception**
- **Exhibit Hall Happy Hour**
- **Women in Science Breakfast**

All of these events except the Women in Science Breakfast are included in your registration fee. Tickets for the Women in Science Breakfast can be purchased for \$25 through the meeting registration form.

For Young Professionals



The following activities at TMS2015 have been designed with professionals aged 40 and under in mind:

- **Young Professional Tutorial Luncheon Lecture** (See details below)
- **Young Professional Happy Hour Reception**
- **Technical Division Young Professional Poster Contest**
- **Meet the Candidate Employment Poster Session**—It's not too late to participate in this event that connects job seekers with potential employers. Submit an abstract by December 1!

Young Professional Tutorial Luncheon Lecture



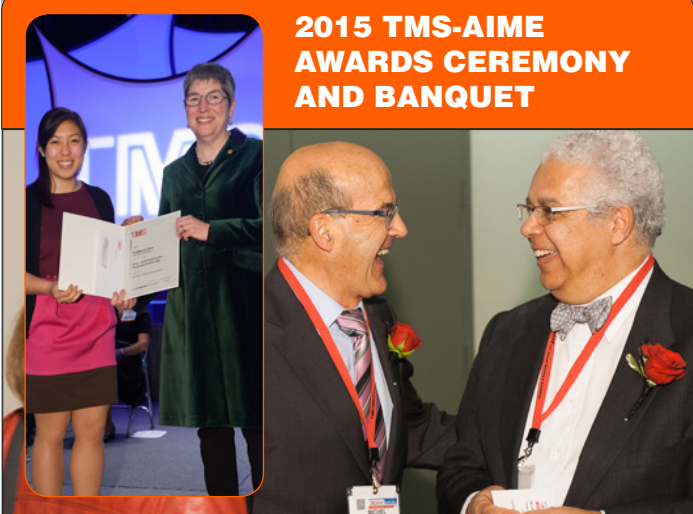
"Teaching Sustainable Chemical Metallurgy in 2015"
Antoine Allanore, Massachusetts Institute of Technology



"Material Science: A Field Present in Every-Day Life and A Unifying Discipline, but Often Not on Students' Radar"
Peter Hosemann, University of California

These lectures are open to all attendees, but lunch can be purchased through the TMS2015 registration form for \$48.

2015 TMS-AIME AWARDS CEREMONY AND BANQUET



The 2015 TMS-AIME Awards Ceremony and Banquet will be an elegant event, designed to honor the significant professional achievements of members of the minerals, metals, and materials community. The ceremony includes presentations of awards from both TMS and the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME), of which TMS is a member society, and the installation of the 2015 TMS president. The banquet will be a black-and-white themed dinner featuring live music and a performance by a professional magician. The ceremony portion of the evening is open to all TMS2015 attendees. Tickets for the banquet may be purchased for \$95 through the TMS2015 registration form.



**NEW FOR 2015:
Meet a Mentor
Monday, March 16**

This event is designed to connect early-career professionals (mentees) with professionals who have ten or more years of experience in their field (mentors). Mentors and mentees can discuss technical expertise, advice on becoming involved with TMS, or general career tips. The event is free, but advance registration is required. Sign up through the Networking section of the TMS2015 website.

For Students

The following networking events and contests are designed specifically to help undergraduate and graduate students make the most of their meeting experience:

- **Technical Division Student Poster Contest**
- **Student Networking Mixer**
- **Student Career Forum**
- **TMS2015 Materials Bowl**—It's not too late to participate in this materials-themed knowledge and trivia competition. Register your student chapter by December 15!

NEW FOR 2015: Student Sendoff Lunch

As the meeting begins to wind down, take this final opportunity on Wednesday to relax and swap stories with the friends that you've met over the course of the week. Boxed lunches will be provided for all student attendees.

TMS 2015 Exhibition



Exhibit Dates

March 16-18, 2015

All TMS2015 registrants receive a three-day pass to the TMS 2015 Exhibition—a global showcase for the latest products, technologies, and services in the minerals, metals, and materials industries.

To date, more than 70 companies have purchased booths in the TMS2015 exhibit hall. Spots are still available for exhibiting companies. Contact Caron Gavrish at cgavrish@tms.org or visit the TMS2015 website for details on how to join the exhibition.

**NEW
FOR 2015:**

A CALL TO ARMS



This year, TMS meeting attendees are challenged to display their forging skills as part of the meeting's first-ever bladesmithing competition. The blade entries, along with videos depicting their creation, will be on display in the exhibition hall.

Cash prizes will be awarded to the best blades.

Register by December 15, 2014 to enter the competition at www.tms.org/bladesmithing

Sponsorship opportunities are available. Contact Caron Gavrish at cgavrish@tms.org

PROFESSIONAL DEVELOPMENT

LEARN. NETWORK. ADVANCE.



A dozen workshops and short courses led by expert instructors will be offered in conjunction with TMS2015 to help attendees expand their knowledge and skillsets. Visit www.tms.org/PD2015 for complete course descriptions and registration information. All courses will be held on Sunday, March 15, prior to the start of the meeting's technical programming.

Additive Manufacturing Materials and Processes Workshop

Familiarize yourself with current additive manufacturing (AM) processes; current AM practice for metals, polymers and ceramics; modeling of AM processes, microstructural evolution, and service properties; and current challenges and research opportunities.

Aluminum Melting Workshop

This workshop will foster informal discussions and debate on important elements of aluminum melting, including recycling of scrap and preparation of the metal for casting. Presenters will share fundamental background information and best practices for critique and discussion.

Characterization Techniques for Magnetic Materials Workshop

Renowned experts in the field will present the fundamentals of structural, compositional and functional characterization techniques applied to magnetic materials. Computational methods will also be covered in this course.

Explore the Use of the CALPHAD Modeling Tools for Your Daily Practice

This workshop will provide an overview of the CALPHAD approach, its basic principles, and its applications, from the basics of phase diagrams and the CALPHAD approach to applications of this approach to multicomponent systems for material design and development.

Friction Stir Welding and Processing Short Course

Focusing on both the fundamental and practical aspects of friction stir welding and processing, this course is designed to provide a basic understanding of the process and the linkage to performance by introducing aspects from basic process design, controls, tools, and metallurgical aspects.

11th Annual Lead-Free Solders and Interconnect Technology Workshop

Through presentations and extensive discussions, this workshop will provide a bridge between companies, academic research groups, national laboratories, and consortia, and will lead to the materials science fundamentals necessary for further understanding and future industry applications.

Mentorship for Young Scientists: Developing Scientific Survival Skills Workshop

This workshop is a short version of the graduate course "Survival Skills for Scientists" developed and taught by Federico Rosei at the University of Quebec. The central theme is that succeeding in science requires skills (often referred to as "soft professional skills") beyond basic scientific skills.

Multiphysics Materials Simulations Using the Open Source MOOSE Framework Workshop

The Multiphysics Object Oriented Simulation Environment (MOOSE) is an open-source framework aiding in the development of scientific simulation tools widely used for materials studies at the engineering and mesoscales. This tutorial will cover everything necessary to use MOOSE and its modules in the creation of new materials applications.

Nano- and Micro-Mechanical Measurements in Harsh Environments Workshop

This tutorial focuses on the practical, hands-on requirements for testing in "extreme" environments. International experts in nano- and micro-mechanical testing at high temperature, cryogenic temperatures, in-situ irradiation, and corrosive liquid environments will discuss their experimental approaches for best practices and obtaining reliable data that can be used for engineering purposes.

Supplier Technology Workshops: Anode Carbon and Reduction

Enjoy one-on-one time with aluminum companies at these unique workshops, consisting of presentations by companies that develop technology, products and capability, or services to support the aluminum industry. Two concurrent sessions will focus on anode carbon and reduction issues. If you are interested in becoming a Supplier Presenter, please contact MaryTherese Gallagher at mgallagher@tms.org.

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**Join your peers in the
minerals, metals, and materials
community at TMS2015 for:**

- More than 3,000 presentations on a broad range of technical topics
- A vibrant exhibition of products and services, including a display of the 2015 TMS Bladesmithing Competition entries
- Special presentations delivered by leaders in the field
- A broad selection of professional development courses
- Extensive networking opportunities

TMS

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