



TMS2013

142nd Annual Meeting & Exhibition

March 3-7, 2013

Henry B. Gonzalez Convention Center
San Antonio, Texas, USA

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

PROGRAM PREVIEW



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www.tms.org/TMS2013

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**SEE THE
2013 TMS-AIME
HONORS & AWARDS
WINNERS INSIDE**



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Join The Minerals, Metals & Materials Society (TMS) for the **TMS 2013 Annual Meeting & Exhibition**, a venue where materials scientists and engineers can share research, network, and grow professionally. This preview of the 2013 conference provides a look at technical program highlights, social and networking events, featured presentations, and continuing education opportunities, as well as instructions on how to register and where to stay.

Now in its 27th year, the TMS 2013 Annual Meeting Exhibition is a global showcase for products and services designed specifically for the markets. This three-day event, held **March 4-6**, is open to all full-conference registrants, making it a dynamic meeting place where top suppliers to the metals industry join specialists in materials testing and characterization.

Who Attends

Materials scientists and engineers working in industry, academia, and government from more than 68 countries present papers, exhibit, and network at the TMS Annual Meeting & Exhibition each year. Attendees include those from all phases of their careers: from students and young professionals to experienced professionals and retirees. Last year's meeting, in Orlando, Florida, attracted more than 4,300 attendees.

Technical Program

Over the course of four days, nearly **3,800 technical presentations** will be delivered at more than **330 technical sessions** in the following programming tracks:

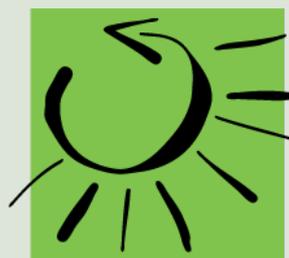
- Advanced Characterization, Modeling, and Performance
- High-Performance Materials
- Light Metals: Aluminum, Magnesium, and Titanium
- Materials and Society: Energy Technology, Policy, and Education
- Materials Processing and Production
- Nanoscale and Amorphous Materials
- REWAS 2013 – Enabling Materials Resource Sustainability

Registration Rates

	Advance Fees	On-Site Fees
Member	\$575	\$675
Non-Member Presenter <small>(Includes TMS Membership for 2013)</small>	\$690	\$790
Non-Member <small>(Includes TMS Membership for 2013)</small>	\$725	\$825
Senior Member	\$425	\$525
Student Member	\$100	\$125
Student Non-Member <small>(Includes Material Advantage Membership for 2013)</small>	\$130	\$155
Daily Registration Member	\$395	\$450
Daily Registration Non-Member <small>(Includes TMS Membership for 2013)</small>	\$445	\$495
Exhibit Daily Only	\$50	\$50

Not a Member?

Register at the Non-Member Rate and you'll receive TMS membership for 2013.



REWAS
2013
Enabling Materials
Resource
Sustainability

The REWAS 2013 sessions are designed to provide an interdisciplinary and multi-disciplinary platform for metals and materials professionals and others to address sustainability in industry and society. By taking a **material-focused perspective**, as well as a product-focused perspective, bridges between the two can be forged.

Materials experts will be the key to realizing, enabling, and understanding sustainability via a broad, systems-level perspective to their work. REWAS 2013 was organized to showcase this emerging perspective in materials research with targeted symposia in these three key areas: **realizing, enabling, and understanding sustainability.**

2013 TMS-AIME Honors & Awards Winners

The TMS 2013 Annual Meeting & Exhibition is about more than technical exchange; it's also about recognizing the people behind the technology. Join us at the 2013 TMS-AIME Honors & Awards Banquet to celebrate this year's award recipients with live entertainment, gourmet dining, and an extravagant dessert buffet. Register for this event in advance through the meeting registration form and meet the TMS members who will be honored at this year's banquet and other events throughout this brochure.

Alexander Scott Distinguished
Service Award



Ray Peterson
Aleris International Inc

AIME Honorary
Membership



Bhakta Rath
Naval Research Lab

Application to
Practice Award



Timothy Wehs
Johns Hopkins
University

Bruce Chalmers
Award



Sindo Kou
University of Wisconsin



**Global R&D Trends:
Implications for Material Sciences**

The Acta Materialia Materials and Society Award
Special Symposium

In the last century, investments in research and development (R&D) have been critical to ensuring the deployment of new materials required to solve the world's most pressing needs. R&D support is considered a leading indicator of a nation's innovative capacity and a precursor to its future growth, productivity, and sustainability. Exploring the connections between fundamental R&D and materials science, within the context of a complex and often volatile global economy, is the focus of this symposium, planned to highlight the achievements of Jeffrey Wadsworth, a member and Fellow of TMS, who will accept the prestigious Acta Materialia Materials and Society award at TMS2013.

Speakers:



Jeffrey Wadsworth
President and Chief Executive Officer, Battelle Memorial Institute
Keynote Presentation: "The Evolving R&D Model: International Trends and U.S. Competitiveness"



Craig R. Barrett
Retired Chief Executive Officer/Chairman of the Board, Intel Corporation
Topic: Research and Development—The Key to Competitiveness in the 21st Century



Siegfried S. Hecker
Co-Director, Center for International Security and Cooperation
Emeritus Director, Los Alamos National Laboratory
Topic: Challenges for a Global Nuclear Energy Future



William Nix
Professor Emeritus, Lee Otterson Professor of Materials Science and Engineering, Stanford University
Topic: Linking the Challenges of Materials Technology with Opportunities in Materials Research



Subra Suresh
Director, National Science Foundation
Topic: Global Science and Engineering

**TMS2013 Keynote Session:
Impurities in the Aluminum Supply Chain**

This keynote session will include invited presentations from leading industry experts that examine the role and outlook for impurities across the aluminum supply chain.

Planned Presentations:



"Raw Material Impurities and the Challenge Ahead"

Stephen Lindsay, Alcoa Inc.



"Impacts of Impurities Introduced into the Aluminium Reduction Cell"

James Metson, University of Auckland



"Changes in Global Oil Refining and Its Impact on Anode Quality Petroleum Coke"

Karl Bartholomew, KBC Advanced Technologies, Inc.



"Impact of Higher Vanadium Levels on Smelter Operations"

John Gavin, RTA Sebree



"Impact on Smelter Operations of Operating High Purity Reduction Cells"

Stewart Hamilton, New Zealand Aluminium Smelters



"Management of Impurities in the Aluminium Cast House"

Muhammad Akbar Rhamdhani, Swinburne University of Technology



"An Initial Assessment of the Effects of Increased Ni and V Content in AA6063 and A356 Alloys"

John Grandfield, Grandfield Technology

Brimacombe Medalist



Ellen Cerreta
Los Alamos
National Laboratory



Nikhilesh Chawla
Arizona State
University



Joy Forsmark
Ford Motor Co.



Alan Luo
General Motors
Co.

AIME Champion H. Mathewson Award



Jung-Kuei Chang
Chung Hsin Electric &
Machinery MFG Corp



Eric M. Taleff
University of
Texas



Paul Krajewski
General Motors
Co.

Cyril Stanley Smith
Award



Leonid Bendersky
National Institute of
Standards & Technology



SESSION SPOTLIGHTS

2013 International Nickel-Cobalt Symposium



A Collaborative Effort Between TMS and the Metallurgy and Materials Society (MetSoc) of the Canadian Institute of Mining, Metallurgy, and Petroleum

From mining and mineral processing, to final products, to recycling, Nickel-Cobalt 2013 will offer as complete a picture as possible of the latest developments covering the entire value chain of both metals. The opening session of this symposium will include plenary lectures on nickel laterite production technology, the history of the major alloy utilizing nickel, current developments in the cobalt market, and the recycling of cobalt-containing materials.

Innovation in Materials & Manufacturing for Advanced Energy

A Plenary Session Sponsored by the TMS Materials Innovation Committee



Visit www.tms.org/tms2013 for details on this developing session in an area of strategic significance to TMS and the materials science and engineering community, organized by **Jud Ready** of the Georgia Institute of Technology and **Edward Herderick** of Edison Welding Institute.

DIVISION AND AWARD LECTURES

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



Speaker: **Maurits Van Camp**, Director of the Recycling & Extraction Technologies Platform at Umicore Group Research and Development
Lecture Title: "Sustainability: A Paradigm Shift for Metals?"

Extraction & Processing Division Distinguished Lecturer



Speaker: **Donald Sadoway**, John F. Elliott Professor of Materials Chemistry, MIT
Lecture Title: "Innovation in Electrochemical Technology: from Batteries to Metals Extraction"

Institute of Metals/Robert Franklin Mehl Lecture



Speaker: **Horst Hahn**, Executive Director, Institute for Nanotechnology, Karlsruhe Institute of Technology

2013 William Hume-Rothery Award Lecture



Speaker: **Alex Zunger**, Professor, University of Colorado, Boulder
Lecture Title: "First Principles Alloy Theory – A Retrospective"

Other featured speakers will include:

Light Metals Division Luncheon Speaker*: **John Mitchell**, President of North America Operations, Rockwood Lithium

Vittorio de Nora Prize Lecturer: **Leon Prentice**, Senior Research Engineer, CSIRO Process Science and Engineering

Japan Institute of Metals Young Leader International Scholar Lecture: **Yoji Miyajima**, Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology

* Tickets required. Reserve your place at this event through the TMS2013 registration form.

Early Career Faculty Fellow Award



Julia Greer
California Institute of Technology

Educator Award



Marc Andre Meyers
University of California

TMS 2013 Fellow Award



George "Rusty" Gray
Los Alamos National Laboratory



Robert Shull
National Institute of Standards & Tech



David Srolowitz
University of Pennsylvania



Peter Voorhees
Northwestern University

Institute of Metals/Robert Franklin Mehl Award



Horst Hahn
Karlsruhe Institute of Technology

Leadership Award



Julie Christodoulou
Office of Naval Research



Learn a new skill or take an in-depth look at a particular topic with workshops, tutorials, and short courses held in conjunction with TMS 2013. The following Continuing Education courses will be held prior to the start of the conference's technical programming, which begins on **Monday, March 4**, so attending a continuing education course will not conflict with other meeting programming.

TMS CONTINUING EDUCATION

CHOOSE FROM EIGHT WORKSHOPS,
TUTORIALS, AND SHORT COURSES

Extractive Metallurgy of Nickel and Cobalt

Saturday, March 2–Sunday, March 3, 2013

Presented by industrial and academic experts, this two-day short course will examine the fundamentals and current trends of the processing used to produce nickel and cobalt from primary and secondary sources.

Titanium: History, Science, Technology, and Applications

Saturday, March 2–Sunday, March 3, 2013

This presentation will cover all aspects of the history, physical metallurgy, corrosion behavior, cost factors, and current and potential uses of titanium.

New Applications of Small-Scale Mechanical Testing

Sunday, March 3, 2013

This tutorial will cover new advances in small-scale mechanical testing techniques with emphasis on measuring environmentally dependent mechanical behavior.

9th Annual TMS Lead Free Solder and Interconnect Technology Workshop

Sunday, March 3, 2013

This popular annual workshop will include coverage of reliability in consumer electronics, future directions in new solder alloy compositions, and solder and interconnects in extreme environments.

Furnace Systems Technology Workshop

Sunday, March 3, 2013

This course is a comprehensive review of furnace technology and cast shop practices for improving efficiency, quality, and productivity, while minimizing emissions and waste.

Introduction to Integrated Computational Materials Engineering (ICME)

Sunday, March 3, 2013

Designed to provide engineers and managers with a general overview, this course offers a primer on the various types of models and simulation methods involved in ICME.

Managing Technical and Financial Risk in a New Technology Project Environment

Sunday, March 3, 2013

The natural outcome of new technology Mega-Projects seems to be technological success, but financial failure. All those who have 'failed' before us, were just as intelligent, educated, and experienced as we are. The best way to avoid sharing their fate is to study their 'modes' of failure and improve our project management systems accordingly.

Modeling Electrodeposition in Materials Processing Operations

Sunday, March 3, 2013

This course will cover the basics of modeling transport-limited electrodeposition, including fluid dynamics, for materials processes from molten salt electrolysis to electrorefining to electroplating.

NEW FOR 2013:

Downloadable Collected Proceedings

All TMS2013 registrants will receive free, on-line access to the conference's collected proceedings. Attendees will be given a Web address and redemption code to access all 2013 proceedings books in a single download from **March 3, 2013 to September 3, 2013**.

Morris Cohen Award



Gregory Olson
Northwestern
University

AIME Robert Lansing
Hardy Award



Markus Buehler
Massachusetts Institute
of Technology

William Hume-Rothery
Award



Alex Zunger
University of Colorado

Shri Ram Arora Award



Sumit Goenka
Carnegie Mellon
University

Vittorio de Nora Prize for Environmental
Improvements in Metallurgical Industries



Leon Prentice
CSIRO Process Science and
Engineering

Acta Materialia Materials
and Society Award



Jeffrey Wadsworth
Battelle Memorial
Institute



NETWORKING SESSIONS

Networking Meeting of the Membership

Sunday, March 3, 2013

Join your TMS colleagues and the officers of the society for an informal opening reception, designed to provide an opportunity for networking with other attendees. Food and drinks will be provided, and participants will have the opportunity to learn about the progress the society has made in the past year, as well as preview exciting new plans for the future. While there is no cost to attend, TMS requests that participants sign up for this event on the conference registration form.

Women in Science Breakfast

Monday, March 4, 2013

Organized by the TMS Women in Science Committee, this annual event offers an opportunity for TMS members to network and discuss issues specific to women in the science and engineering professions. Tickets can be purchased when registering for TMS2013.

Federal Funding Workshop

Wednesday, March 6, 2013

Sponsored by the TMS Public & Governmental Affairs Committee, the 2013 TMS Federal Funding Workshop is an interactive session that will provide an overview of key funding opportunities that support Materials Innovation concepts, as well as opportunities to network with funding officers.

HONORARY SYMPOSIUM

Materials Research Applied to National Needs (MARANN) in Honor of Professor Morris E. Fine



This symposium will honor **Professor Morris E. Fine** of Northwestern University on his 95th birthday for his outstanding contributions to the field of materials science and engineering. It will also offer a mechanism for researchers, students, engineers, and administrators working in academia, industry, and national laboratories to promote idea exchanges and advance the fundamentals and applications of materials science and engineering. The process from materials research to successful applications will be examined by invited and contributed speakers from academia, industry, and U.S. government in areas of current interest in all classes of materials.

FOR YOUNG PROFESSIONALS

The following activities at TMS2013 are specially designed for young materials professionals, aged 40 and under.



Young Leader Tutorial Luncheon Lecture



"A Scientist, a Parent, a Teacher, a Mentor . . . How to Balance it All?"

Julia R. Greer, 2013 TMS Early Career Faculty Fellow Award Winner and Assistant Professor of Materials Science and Mechanics at California Institute of Technology (Caltech)

This talk will focus on work/life balance and on how to balance professional and personal activities without feeling overwhelmed. While there is no cost to attend, boxed lunches can be purchased through the meeting registration form.

Meet the Candidate Employment Poster Session

Organized by the TMS Young Leaders Committee, this session allows young professionals to connect with potential employers for post-doctoral, full-time, or faculty positions. Candidates present posters to potential employers from universities, industries, and national labs. To participate, submit an abstract by **January 15, 2013**, through ProgramMaster, accessible through the TMS 2013 website.

NEW FOR 2013:

Technical Division Young Professional Poster Contest

Young professionals are invited to submit posters related to each of the five TMS technical divisions: Electronic, Magnetic & Photonic Materials; Extraction & Processing; Light Metals; Materials Processing & Manufacturing; and Structural Materials. The winner in each division will be awarded \$500. To participate, submit an abstract by **December 15, 2012**, through ProgramMaster, accessible through the TMS 2013 website.

Young Leader Happy Hour Reception

Wednesday, March 6, 2013

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

J.K. Brimacombe Prize



Jonathan Dantzig
University of Illinois At
Urbana-Champaign

Presidential Scholarship Award



Bradley Potter
Case Western
Reserve University

Henry DeWitt Smith Scholarships



Niaz Abdolrahim
Washington State
University



Dmitri Nassyrov
McGill University

EMPMD Distinguished Service Award



Jeff Hoyt
McMaster University

TMS Best Paper - Graduate Division
1ST Place 2ND Place



Cheng Sun
Texas A&M University



Chih-Pin Chuang
University of Tennessee

FOR STUDENTS

The following activities are designed specifically for undergraduate and graduate student attendees.

TMS 2013 Materials Bowl

Sunday, March 3, 2013

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

Student Mixer

Sunday Evening, March 3, 2013

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

Student Poster Contest

Monday, March 4, 2013 through Tuesday, March 5, 2013

Browse the student poster displays at your leisure or attend the official contest judging session to ask questions of the contest participants or to answer questions about your own work.

Career Forum

Tuesday, March 5, 2013

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

For more information on participating in student competitions, like the Materials Bowl and Poster competition, visit www.tms.org/tms2013.



FOR VOLUNTEERS

TMS would like to thank its volunteer leaders for their dedicated service by offering the following at-meeting benefits—available exclusively to TMS volunteer leaders:

Peer-to-Peer Networking Event

Monday, March 4, 2013

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

Volunteer Leadership Lounge

Sit down, grab a coffee, check e-mails with free wireless Internet, or hold informal meetings with colleagues at the Volunteer Leadership Lounge, open exclusively to TMS volunteer leaders.

HOUSING AT TMS2013

Reserve a Hotel Room

Book a hotel room for your stay through Travel Planners, the official TMS2013 reservation service. Travel Planners will accept reservations through **February 27, 2013**, but book early to guarantee a room at your first-choice hotel.

Grand Hyatt San Antonio: The TMS2013 Headquarters Hotel

For convenient access to social functions, networking events, and committee meetings during the TMS2013 Annual Meeting & Exhibition, book a room at the Grand Hyatt San Antonio, the TMS2013 Headquarters Hotel. In addition to being the meeting place for a number of conference-related events, the Grand Hyatt San Antonio is also adjacent to the Henry B. Gonzalez Convention Center—where technical sessions, plenaries, and the exhibit hall will be located—and the San Antonio Riverwalk, which provides convenient access to food and entertainment.

Additional Hotels

Through Travel Planners, you can book a room at one of six San Antonio hotels at which TMS has reserved room blocks: Grand Hyatt San Antonio, Hilton Palacio del Rio, Hyatt Regency San Antonio, La Quinta Inn and Suites San Antonio Convention Center, San Antonio Marriott Rivercenter, or Marriott San Antonio Riverwalk Hotel

Register and book housing today through the TMS website:

www.tms.org/tms2013

SMD Distinguished
Scientist/Engineer



Carlos Tome
Los Alamos National
Laboratory

SMD Distinguished
Service Award



David Bahr
Purdue University

Young Leader International Scholar
JIM FEMS



Sandip
Harimkar



Amy
Clarke

MPMD Distinguished Service &
Distinguished Scientist/Engineer



Thomas Bieler
Michigan State University

EPD Distinguished
Lecturer



Donald Sadoway
Massachusetts Institute
of Technology

EPD Distinguished
Service Award



Adam Powell
Metal Oxygen
Separation Technologies

EPD Science
Award



Peter Hayes
University of
Queensland



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What can you do through the TMS2013 website?

Visit www.tms.org/tms2013 to:

- **Register for the conference.**
Save up to \$100 by registering before February 1.
- **Reserve a hotel room.**
Rooms are available at the Grand Hyatt San Antonio and several other area hotels.
- **Preview the Technical Program.**
Text search and view technical presentation titles and abstracts.
- **Learn about Special Symposia and Lectures.**
View presentation titles, speaker biographies, and other details.
- **Choose Networking Events.**
Learn about receptions and activities for materials professionals at all career stages.
- **Register for Continuing Education Courses.**
Choose from eight planned workshops, tutorials, and short courses.
- **Preview the Exhibit.**
Search the list of exhibitors for products and services.
- **Become an Exhibitor or Sponsor an Event.**
Find information on how to raise your company's visibility at TMS2013.
- **Gather Travel Information.**
Learn about the TMS2013 host city: San Antonio, Texas.
- **Reserve Space at Ticketed Events.**
Register for special luncheons and dinners through the conference registration form.
- **Learn about Student Events.**
Enter student contests and plan for activities.

