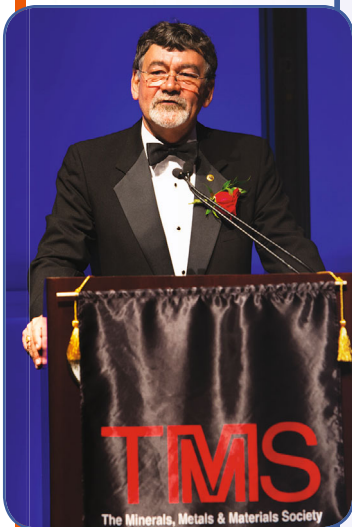


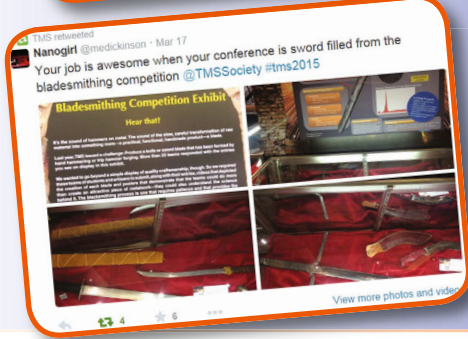
TMS 2015

Sharing the #TMS2015 Experience

Lynne Robinson
and Kaitlin McMahon



Patrice Turchi, 2015 TMS President, introduces himself to the membership at TMS2015.



They were easy to spot as they walked and congregated in the sprawling complex of the Walt Disney World Swan & Dolphin Resort from March 15–19.

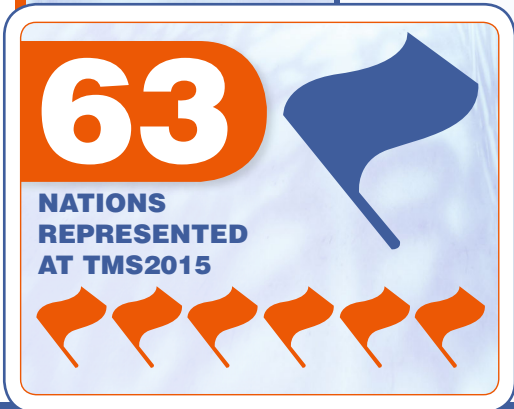
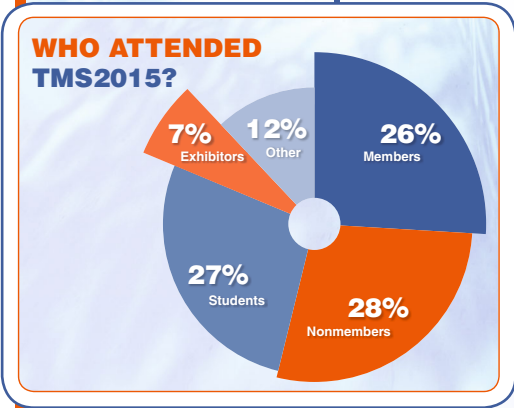
One clue was the bright blue lanyards clipped to name tag packets emblazoned with the TMS2015 logo and stuffed with tickets to networking events. Another was the intensity and excitement that all 4,203 attendees of the TMS 2015 Annual Meeting & Exhibition (TMS2015) shared as they prepared for presentations, headed into technical sessions, or caught up with colleagues and friends.

A glimpse of that energy was revealed at #TMS2015Experience where TMS members, exhibitors, students, and others shared their personal observations of the meeting via Twitter. For those not familiar

with this particular flavor of social media, Twitter is an online service that gives users the ability to send and read in-the-moment 140-character messages, called “tweets.” For TMS2015, these little packages of insight conveyed everything from appreciation for a good point made at a symposium to hopefulness at winning a student competition.

From a sheer numbers perspective, TMS2015 adjourned as a solid success, with 3,285 papers and posters presented in 451 sessions. The TMS2015 collected proceedings captured some of what was learned by publishing more than 900 of those papers, while at least 23 symposia will have papers published in TMS journals. Complementing the bedrock activities of the annual meeting were several new or enhanced events, including a record-setting number of well-attended professional development courses, the hotly contested TMS Bladesmithing Competition, and an engaging speed mentoring event.

In his remarks at the TMS–AIME (American Institute of Mining, Metallurgical, and Petroleum Engineers)

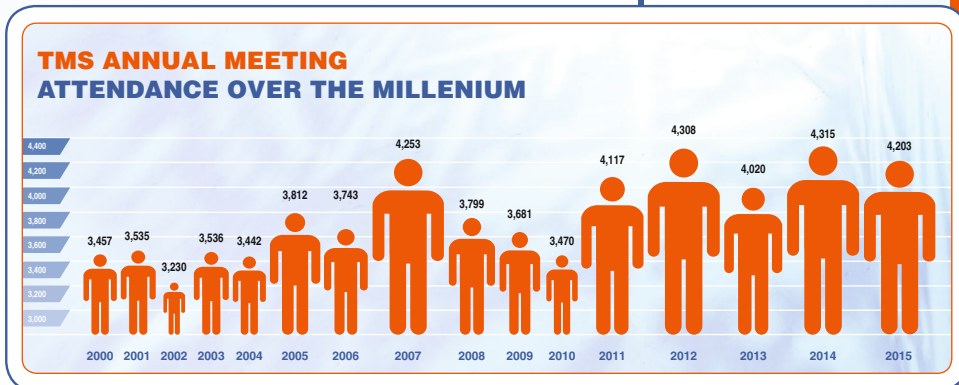


Awards Ceremony, Patrice Turchi, 2015 TMS President, noted that one factor in his decision to make TMS his professional home was “the diversity in programming, from minerals processing and primary metal production to recycling, with basic and applied sciences and advanced applications in between.”

Turchi continued that, as TMS President in the coming year, he plans to build on the programming strength of the TMS annual meeting, as well as specialty meetings. “I will be asking the programming, technical division, and technical committee chairs to re-examine the way symposia are organized by adding extra strategy-related thinking into the dedicated work they do. This will serve to design a plan for advancing diversity, increasing the engagement of our industrial partners, and expanding our global activities, while also addressing the impact of increased attendance at TMS-sponsored meetings on programming. So, by fostering new and diverse associations and initiatives, the TMS motto ‘learn, network, and advance’ will be enhanced and truly experienced by our membership

and the scientific community at large.”

With its member-driven culture, TMS “provides opportunities for any one of its members to shape programming and many of its other activities and products,” said Turchi. He reflected on the progress that past TMS presidents have made in diversity and inclusion, global outreach, and advanced manufacturing, observing that “one of my responsibilities will be to ensure that programs such as those just mentioned have a chance to bloom.” He stressed that “presidents are not a special breed at TMS. They represent the rank-and-file members who, like me, served as volunteers, and recognized over the years that empowering TMS to meet the current and future needs of its membership could also help better advance our profession.”



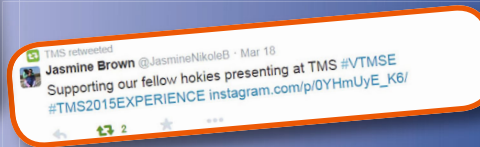
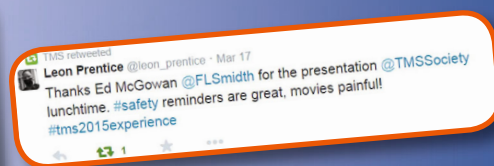
The TMS Board of Directors takes a moment from a busy week of meetings at TMS2015. (Left to right): Patrice Turchi, 2015 President; James J. Robinson, TMS Executive Director; David Bahr, Membership & Student Development Director, 2012–2015; Jeffrey Fergus, Professional Development Director, 2014–2017; Neville Moody, Programming Director, 2012–2015; James Foley, Materials Processing & Manufacturing Division Chair, 2013–2016; David DeYoung, Light Metals Division Chair, 2013–2016; Edward Herderick, Public & Governmental Affairs Director, 2014–2017; Hani Henein, 2014 President; Eric Brown, Content Development & Dissemination Director, 2014–2017; Mark Schlesinger, Extraction & Processing Division Chair, 2014–2017; Stanley Howard, 2015 Vice President; Robert Hyers, Financial Planning Officer, 2012–2015; Joy Forsmark, Financial Planning Officer, 2015–2018; Rajiv Mishra, Structural Materials Division Chair, 2013–2016; Amy Clarke, Membership & Student Development Director, 2015–2018; Elizabeth Holm, 2013 President; Roger Narayan, Functional Materials Division Chair, 2014–2017.

Submit Your Abstract for TMS2016 by July 1

Don't miss your opportunity to be part of TMS2016, February 14–18, at the brand-new Music City Center in downtown Nashville, Tennessee. Submit your abstract by July 1, 2015 via ProgramMaster at the TMS2016 website, www.tms.org/tms2016. Determine the best fit for your presentation by reviewing the complete online listing of symposia and then check back frequently for news and programming updates.

TMS2016
145th Annual Meeting & Exhibition

TMS 2015



The #TMS2015 Programming Experience

Light Metals Industries Share Lessons Learned on Smelting Processes



TMS2015 Light Metals plenary participants (front row, left to right): John Grandfield, Grandfield Technology Pty Ltd.; Mark Cooksey, CSIRO; Asuncion Aranda, Institute for Energy Technology (IFE); Kathie McGregor, CSIRO. (Back row, left to right): Zhigang (Zak) Fang, University of Utah; James Klausner, U.S. Department of Energy; Aldo Steinfeld, ETH Zurich; James Sever, Nevada Clean Magnesium and Alpha/Omega Engineering; James Metson, University of Auckland; Roman Deshko, Hatch.

TMS2015 Light Metals Keynote Session, Latest Developments in Smelting of Light Metals, as noted by the session chair, John Grandfield. This year marked a departure from the session's traditional focus on aluminum topics to facilitate cross-learning from experts representing three light metals industries. One commonality that Grandfield pointed out in his introductory remarks was the longevity of the most prevalent smelting processes—Hall-Héroult electrolysis for aluminum, Kroll for titanium, and Pidgeon for magnesium. None of their namesake inventors, he observed, had predicted that their methods would still dominate the market decades (and more than a century, in the case of Hall-Héroult) after their discovery. Pressures to reduce energy

“Breaking down silos between the light metals industries and making comparisons” with an eye to advancing new smelting approaches for aluminum, magnesium, and titanium, was the overarching goal for the

intensity and greenhouse gases, along with challenges in accessing feedstocks, managing costs, and navigating a turbulent marketplace, he continued, have both motivated and hindered wide adoption of alternate processes. By examining the status of some of these efforts across industries, Grandfield said it was hoped that the session would provide context for related symposia scheduled throughout the week, encouraging new thinking and interactions on these topics.

James Metson, University of Auckland, opened the session with a historical overview of commercial smelting processes for light metals. In a presentation peppered with anecdotes illustrating the ingenuity of famed innovators, Metson noted that a summary of the long-standing challenge to light metals production “can be encapsulated in terms of energy intensity and greenhouse gas potential. And, we are still a long way from processes considered competitive in dealing with these challenges.”

A lesson learned from history, said Metson, is that “international consensus is needed for a process to be effective. Looking at volume of use and utility, the light metals industries have a bright future. The major issue now is not how to make metal, but to make money in doing so.”

Building on Metson's points regarding



An important contribution of light metals programming at any TMS annual meeting is publication of the annual proceedings volumes, *Light Metals* and *Magnesium Technology*. Hani Henein, 2014 TMS President, congratulates and thanks (above) Margaret Hyland, editor of *Light Metals 2015* and (bottom photo) Michele V. Manuel, lead editor of *Magnesium Technology 2015*.

energy efficiency, James Klausner, U.S. Department of Energy, outlined current light metal production priorities at the Advanced Research Projects Agency-Energy (ARPA-E). While significant fuel economy can be achieved through vehicle lightweighting, Klausner explained that a barrier to wide adoption of light metals for this purpose is the high energy costs and emissions involved with their production, compared with steel. “Right now, you would have to drive 70,000 kilometers in a light metal vehicle before the fuel savings would break even with the energy, cost, and emissions associated with production of a steel vehicle,” he said. He also noted that while steel recycling from vehicles is relatively easy, inexpensive ways to

segregate aluminum and magnesium scrap are still under development, keeping that potential for energy savings out of reach. Klausner touched on a few projects that ARPA-E is supporting to address these issues, as a preview to the Advanced Energy-Efficient Light Metals Extraction Technologies and Processes symposium that highlighted more in-depth reports on these initiatives.

Kathie McGregor, Commonwealth Scientific and Industrial Research Organization (CSIRO), then reviewed a number of emerging titanium production processes, observing, “You are doomed for failure if you only focus on the extraction side of titanium, since 47 percent of the cost is involved in fabrication. Advances in improved extraction processes, powder metallurgy, and manipulation technologies are all required to have the biggest impact on reducing costs and expanding the potential market.”

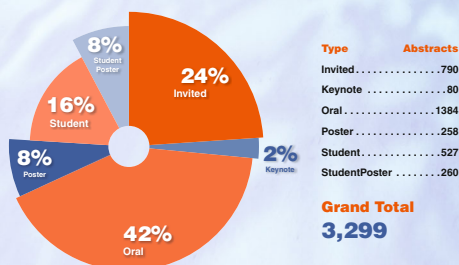
The balance of the keynote session offered detailed discussions on the development and application of specific reduction technologies. Zak Fang, University of Utah, examined the potential of thermochemical processes for low-cost production of titanium. He concluded his talk with a brief report on the Direct Reduction of Titanium Slag (DRTS) project that he is leading. A unique feature of DRTS is a direct reduction step using magnesium hydride to form titanium hydride from upgraded titanium slag. Aldo Steinfeld, ETH Zurich, then provided insights into carbothermic reduction methods using concentrated solar energy to process minerals into metals.

Mark Cooksey, CSIRO, followed with a

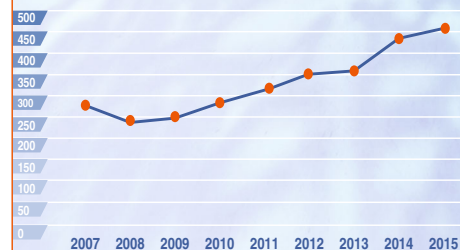
TMS2015 Proceedings Available for Purchase

Couldn't make it to TMS2015? You can still access more than 900 papers presented at the annual meeting by purchasing the proceedings volumes from the meeting, available through TMS's publishing partner, John Wiley & Sons, at www.wiley.com. TMS members receive a 35 percent discount on the list price of these publications, as well as other products sold by Wiley. Access the discount code in the TMS-Wiley Bookstore section of the TMS Knowledge Resource Center at knowledge.tms.org.

TMS2015 PRESENTATIONS



TECHNICAL SESSION GROWTH: 2007-2015



TMS 2015



TMS2015 professional development workshops and courses were the best attended ever, with 276 participants across 10 programs. This represents an approximate 150 percent increase over the last two years for total participation. Pictured is Ray D. Peterson, Technology Director, Recycling Division, Aleris International, and 2009 TMS President, conducting the Aluminum Melting Workshop.

comparison of current research in aluminum and magnesium carbothermal production methods. As part of his discussion, he shared his own experiences with CSIRO's promising MagSonic technology that combines carbothermal reduction and a supersonic rocket nozzle to rapidly cool magnesium vapor. The approach has proven successful in preventing the magnesium from reverting to magnesium oxide, and offers up to a 70 percent reduction in greenhouse gas emissions over traditional methods.

James Sever, Nevada Clean Magnesium, traced the evolution of furnace design and operation in the Balzano and Magnatherm processes to improve upon the Pidgeon process for producing magnesium. Roman Deshko, Hatch, likewise shared a series of flow sheets comparing various electrolytic plants producing magnesium metal and presented a detailed update on the new Qinghai Salt Lake Group Stock Company (QSLG) magnesium plant. The plant avails itself of the Qarhan Salt Lake's extensive chloride-based mineral resources, as well as abundant energy in the form of both natural gas and hydroelectric power. Having access to both raw materials and a long-term local energy source are critical factors in the project's success, noted Deshko.

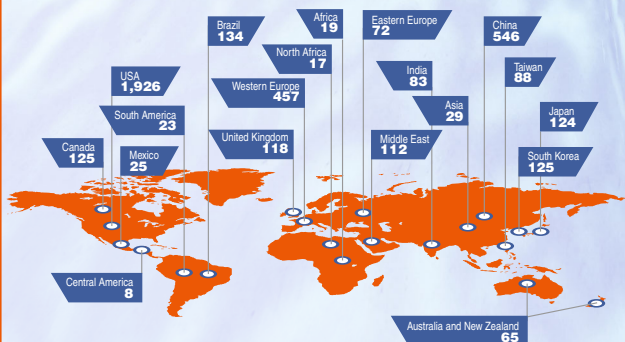
Concluding the session was Asuncion Aranda, Institute for Energy Technology (IFE), who challenged what she referred to as myths regarding sustainability in the



At the TMS2015 Light Metals Division Luncheon, Alan Taub, Chief Technology Officer, American Lightweight Materials Manufacturing Innovation Institute (ALMMII), described the role of ALMMII as getting back to the "missing middle" of manufacturing. "On one side there is a lot of money going into research and on the other side industry does a good job with implementation, but there's a growing gap in the middle between translating basic research into the concepts and technology that industry can pick up," said Taub, a retired vice president of Global Research and Development for General Motors.

minerals industry. "The myths are that we have limited resources and unlimited demand," she said. "The fact is that, through exploration and recycling, we are finding new resources, although the quality varies. Metals are everywhere and do not disappear. The challenge is how to best process them." She then presented IFE's work on developing a process to produce alumina from anorthosite as an alternative to bauxite. Preliminary assessments have been promising, and with zero red mud production, the process is seen as a viable approach to environmentally sustainable alumina production.

ACCEPTED TMS2015 ABSTRACTS BY WORLD REGION



TOP 10 TMS2015 SYMPOSIA



Symposium	Total Presentations
Characterization of Minerals, Metals, and Materials	159
Bulk Metallic Glasses XII	104
Microstructural Processes in Irradiated Materials	104
Magnesium Technology 2015	98
Computational Thermodynamics and Kinetics	90
Materials and Fuels for the Current and Advanced Nuclear Reactors IV	90
Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu	79
Phase Transformations and Microstructural Evolution	78
6th International Symposium on High Temperature Metallurgical Processing	76
Aluminum Alloys: Development, Characterization, and Applications	74

TMS2015 Builds Up Interest in Additive Manufacturing

Additive manufacturing (AM) topics established a significant presence at TMS2015, starting with the Additive Manufacturing Materials and Processes Workshop that drew more than 80 participants. In addition to providing an overview on current challenges to AM adoption, the workshop introduced issues covered in the nine-session symposium, Additive Manufacturing: Interrelationships of Fabrication, Constitutive Relationships Targeting Performance, and Feedback to Process Control. David L. Bourell, Temple Foundation Professor of Mechanical Engineering, University of Texas, served as an organizer for both the workshop and symposium, and was the Structural Materials Division Luncheon speaker on “Additive Manufacturing: Origins, Applications and Future Possibilities.” In his luncheon talk, Bourell observed that the common thread running through all of these intertwined programming events was “determining where it makes sense to use AM and assessing what inroads we need to make on these applications.”

Bourell quickly traced the history of AM through its current surge in interest, noting that the technology was particularly well suited for low production runs and



David L. Bourell examined the past, present, and future of additive manufacturing as the Structural Materials Division Luncheon speaker.

applications with complicated geometries. While the nature of AM gives rise to a unique host of technical and legal challenges, Bourell said the technology will continue to grow and mature. He specifically pointed to the cooperative development of standards by ASTM International and the International Organization for Standardization as a significant milestone in advancing the wide adoption of AM. Futuristic applications such as printing human organs could be quite feasible, he said, commenting, “The potential of AM is staggering in terms of its benefit to society.”

In his invited talk that kicked off the week of technical sessions on AM, Edward Herderick, Additive Technologies Leader, GE Corporate Supply Chain and Operations, presented examples of how AM has enabled a manufacturing-by-design approach, citing how GE has successfully used AM to produce fuel nozzles. Technical areas that he suggested needed to be addressed include developing a better understanding of heat treating and rapid solidification fundamentals; implementing real characterization of the full additive manufacturing process; establishing comparisons between forged, cast, welded, and additive manufactured parts; and expanding availability of applications-based materials.

The TMS2015 additive manufacturing technical track and related programming are just the beginning of a series of opportunities and resources that TMS is offering in the coming months to support advancement of this emerging field. For additional information on how to become engaged in TMS additive manufacturing projects and initiatives, contact Justin Scott at jscott@tms.org.



The keynote talk by Edward Herderick kicked off a week of well-attended technical programming on additive manufacturing topics.

TMS 2015

Symposium Highlights Work of Acta Materialia Honorees

Tresa Pollock, recipient of the 2015 Acta Materialia Hollomon Materials and Society Award, opened the TMS2015 symposium honoring her accomplishment with a quote from an unlikely source—science fiction author Kurt Vonnegut of *Cat's Cradle* fame.

“Herb wanted to take the guesswork and witchcraft out of one of the oldest fields known to mankind,” Vonnegut wrote about J. Herbert Hollomon, for whom the Hollomon Materials and Society Award is named. After explaining that Vonnegut had become acquainted with Hollomon when he worked in public relations at General Electric, Pollock commented, “With a little different wording, maybe this also describes what the Materials Genome Initiative (MGI) is up to and what ICME (integrated computational materials engineering) may have to offer.”

Pollock, 2005 TMS President and 2009 TMS Fellow, and Alcoa Professor of Materials at the University of California, Santa Barbara, then launched into her talk, “Design of New Co-based Alloy Single Crystals: The Impact of an MGI Approach,” sharing how she and her colleagues have used the principles and tools of ICME to develop a new class of high temperature structural alloys. While emerging tools “are coming along,” Pollock said, “The research space for new structural materials is large and not well explored. We are still challenged by the fact that materials

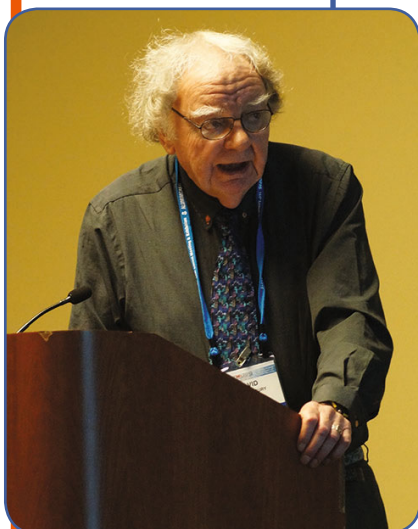


Tresa Pollock, 2015 Hollomon Materials and Society Award recipient.

are necessarily multiphase, multicomponent, and multifunctional.”

J. David Embury, Professor, McMaster University, and recipient of the Acta Materialia Gold Medal Award, followed Pollock with his talk, “Exploring Controlled Heterogeneity as a Strengthening Mechanism.” Through a historic review of “approaches that combine materials and mechanics,” Embury, a 1992 TMS Fellow, set to “reexamine the question of whether we need homogenous or heterogenous materials and whether we can exploit spatial variations in structure by developing architected materials, either by controlling the geometric arrangement of phases or their stability during deforming.”

The TMS2015 Acta Materialia Symposium: Honoring 2015 Award Recipients Tresa Pollock and David Embury was sponsored by Elsevier and Acta Materialia Inc. The Hollomon Materials & Society Award honors an individual who promotes understanding of the relationship and interactions between materials technology and societal interest or needs. The Gold Medal Award recognizes a proven leader in materials science and engineering whose research has significantly impacted the development of the discipline. Pollock and Embury accepted their awards at the 2015 TMS–AIME Awards Ceremony.



J. David Embury, 2015 Gold Medal Award recipient.

TMS2015 attendees representing a broad range of professional interests and career stages packed the room to hear the honored speakers at the Acta Materialia Symposium.



ESS: M&R II Examines Sustainable Management of Materials

Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R) II, organized in conjunction with TMS2015, built on the principles of sustainable engineering that were identified in the inaugural 2009 ESS: M&R symposium. Sustainable management of resources integral to meeting societal needs in energy, transportation, housing, and recycling was the particular focus of the two-day event. Expert speakers shared progress and perspectives from a broad range of industries, including oil and gas, mining, and chemical, as well as civil and materials engineering.

Said Brajendra Mishra, 2006 TMS President and symposium organizer, in his opening remarks, “Through these presentations, the intent is to identify cost-effective, sustainable pathways and strategies for effective use of engineering solutions.” Common themes emerging from the talks included:

- Leaders at the highest levels must take action and set the example in creating a culture of sustainability.
- Education, policy, and innovation are three key axes for achieving sustainability—and scientists and engineers have the power to impact all three.
- Many industries, such as chemical and mining, have made significant shifts in the past decade to incorporate sustainable practices in their business models. However, processes and approaches to measuring progress must be improved.
- A cradle-to-cradle approach must be taken when bringing new products to market or improving upon existing processes.

The proceedings of ESS: M&R II will be released in 2015. Watch for publication details in *JOM*, *TMS e-News*, and other TMS communications. In the

meantime, recordings of select ESS: M&R II plenary presentations will be posted on the TMS website for free download to provide an overview of symposium topics and issues. The presentations that will be made available are:

“Global Materials Resource Challenges (Opportunities) for the 21st Century,” Diran Apelian, 2008 TMS President and Alcoa-Howmet Professor and Director, Metal Processing Institute, Worcester Polytechnic Institute

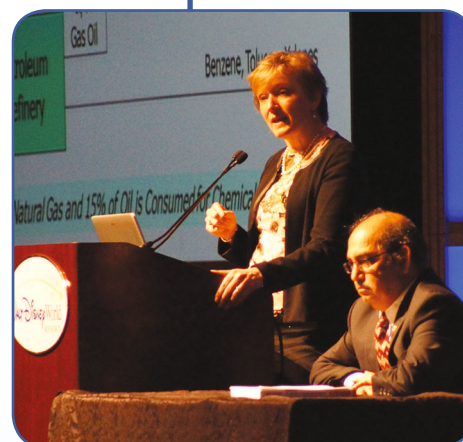
“Sustainability Using Biotechnology for the Chemical Industries,” June Wispelwey, Executive Director, American Institute of Chemical Engineers

“Sustainability: A Business Imperative, Not a Moral Sacrifice,”

Behrooz Fattahi, 2014 AIME President and 2010 Society of Petroleum Engineers President

“Sustainability and Sustainable Development Practices in the Minerals Industry,” Jessica Kogel, Group Mining and Geology, IMERYS and 2013 Society for Mining, Metallurgy, and Exploration President

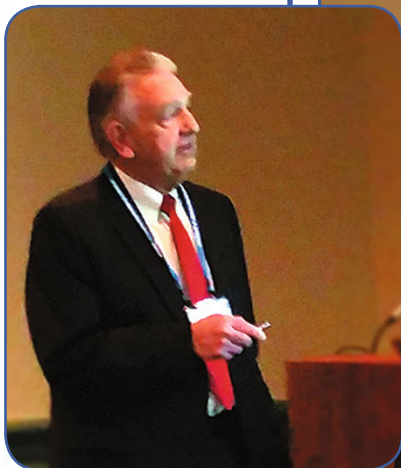
ESS: M&R is a special initiative of AIME in collaboration with other societies.



ESS: M&R II plenary speakers included (from top photo) Behrooz Fattahi, June Wispelwey, (seated is Brajendra Mishra, symposium organizer), and Diran Apelian. Their presentations will be made available on the TMS website.

TMS 2015

A Few Points Taken: TMS2015 Programming Highlights



"I've always thought it was important to think about multicomponent systems if we're eventually going to transition our science to engineering."

—William Boettinger, National Institute of Standards and Technology, recipient of the 2015 William Hume-Rothery Award.



Uday Pal, Boston University, is recognized as the Extraction & Processing Division (EPD) Distinguished Lecturer by Cynthia Belt, EPD Vice Chair. His talk described an energy efficient and environmentally friendly metals production technology that utilizes oxygen-ion-conducting solid oxide membranes to electrolyze metal oxides dissolved in a flux to directly produce metal, along with pure oxygen gas.



"Materials science played a critical role in the evolution of microelectronics. As the device dimensions undergo significant reductions, it is becoming even more important and will have a more significant role in the future."

—Subhash Mahajan, University of California, Davis and recipient of the Institute of Metals/Robert Franklin Mehl Award.



Edward J. McGowan, FLSmidth, discussed how the "envelope of protection" involves all levels of management in mature safety cultures at the Extraction & Processing Division/Materials Processing & Manufacturing Division Joint Luncheon Lecture.

Symposium-Sponsored Competitions

Several TMS2015 symposia provided opportunities for professional recognition through poster and presentation competitions. Congratulations to the following individuals for being selected as award recipients:

Characterization of Minerals, Metals, and Materials Symposium:

- "Characterization of Co-Gd-Ni Alloys," Tim Prost, Scott Chumbley, Yaroslav Mudryk, and Vitalij Pecharsky, Iowa State University/Ames Laboratory
- "Phase Selection in Cu-Zr Metallic Glass," Ilkay Kalay, Eren Kalay, and Matthew Kramer, Cankaya University, METU, Ames Laboratory
- "Doubling the Life of Concrete Structures," Robert Blair, Ian Ehram, Yongfeng Chang, and Batric Pesic, University of Idaho

Dynamic Probing of Microstructure Evolution in Nanostructured Materials Symposium

(Awards Sponsored by Hysitron):

- Hysitron Presentation Gold Medal Award: "In situ Study of Oxygen's Contribution to Mechanical Strengthening in Titanium," Rachel Traylor, University of California, Berkeley
- Hysitron Presentation Silver Medal Award: "Lattice Dislocation Nucleation from Nodes of the (111) Semi-coherent Interfaces," Shuai Shao, Los Alamos National Laboratory
- Hysitron Presentation Silver Medal Award: "Mapping Grains and interface Networks in Atomistic Simulations," Jason Panzarino, University of California, Irvine
- Hysitron Poster Award: "Crystal Plasticity Analysis of Deformation Behavior of Nanocrystalline Nickel," Rui Yuan, Missouri University of Science and Technology

Microstructural Processes in Irradiated Materials Symposium Presentation Awards:

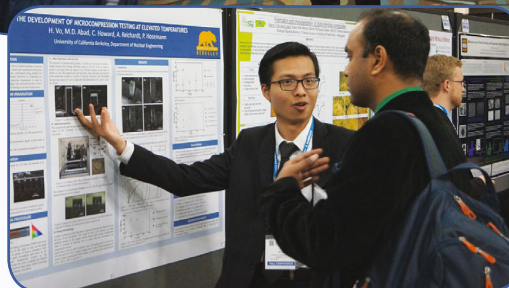
- "Role of Alloy Variation on Swelling Behavior in Self-Ion Irradiated Ferritic-Martensitic Steel," Elizabeth Getto, University of Michigan
- "Characterization of Mesoscopic Fe - {111}, {110} and {100} $Y_2Ti_2O_7$ Interfaces," Tiberiu Stan, University of California, Santa Barbara
- "Ion Irradiation Characterization Studies of MAX Phase Ceramics," Daniel Clark, University of Tennessee

Poster Awards:

- "The Strengthening Mechanism Transition in Nanofeatured Ferritic-Martensitic Alloys," Matthew Swenson, Boise State University
- "Atomistic Characterization of Uranium Vacancy Interaction with External Strains and Dislocations in Uranium Dioxide," Anuj Goyal, University of Florida
- "Swelling, Grain Stability and Hardness Changes of Several Variants of Ferritic Alloy EK-181 at Doses of 100 to 600 dpa during Self Ion Irradiation" and "Microstructure and Mechanical Property Evolution During Tube Processing of Oxide Dispersion Strengthened (ODS) Ferrit Alloys," Eda Aydogan, Texas A&M University

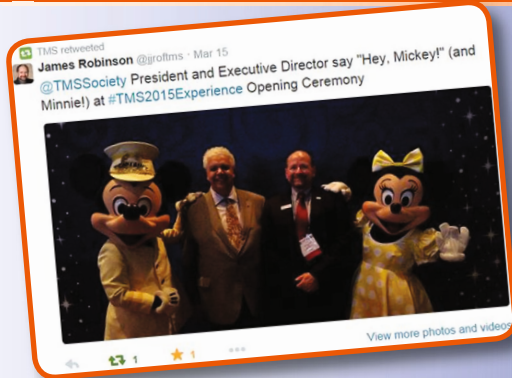
Recycling Symposium Poster Competition:

- "Extraction of Pure Silicon from Aluminum Die Casting Scrap by a Combined Process of Solvent Refining and Centrifugal Separation," Je-Beom Jeon, Ji-Won Yoon, Kum-Hee Seo, and Ki-Young Kim, Korea University of Technology and Education



TMS2015 programming was organized this year to provide more opportunities to participate in the in-depth, one-on-one discussions afforded by poster sessions.

TMS 2015



Celebrating the #TMS2015 Experience



James J. Robinson, TMS Executive Director, welcomes honorees, distinguished presenters, and the audience to the 2015 TMS–AIME Awards Ceremony, which was open to all annual meeting attendees.



Hani Henein, 2014 TMS President, reflects on TMS's accomplishments during his term.

“One of the cornerstones for the role of a professional society is to recognize and celebrate the brightest and best of our profession,” said Hani Henein in his remarks prefacing the TMS–AIME Awards Ceremony. “It is indeed fitting that this be one of my last official duties as President. This is a very high note on which to finish my term.”

Supporting Henein in his hosting duties were the following distinguished TMS



A professional magician circulated among awards banquet attendees as a prelude to an onstage performance that concluded the evening.



A red rose given to each of the Awards Ceremony honorees, including Cheng-Chieh Li, National Taiwan University, made it easy to find them in the crowd for congratulations.

members: Viola Acoff, 2014 Ellen Swallow Richards Diversity Award recipient, who presented awards recognizing the achievements of TMS’s student and mid-career members; Wayne Jones, 1999 TMS President, who honored those receiving TMS pinnacle awards; and John Allison, 2002 TMS President and 2014 TMS Fellow, who introduced the 2015 Class of TMS Fellows.

The awards ceremony and awards banquet that followed in the Disney Yacht & Beach Convention Center Grand Harbor Ballroom were high points in a week brimming with formal and informal gatherings that gave attendees a chance to learn from each other, expand their professional networks, and catch up with a few thousand friends. As Henein observed in his closing remarks, “I offer to Patrice Turchi, 2015 TMS President, this one idea that has greatly benefited me: As a volunteer, sow with your time and you will reap riches of friendships and knowledge.”

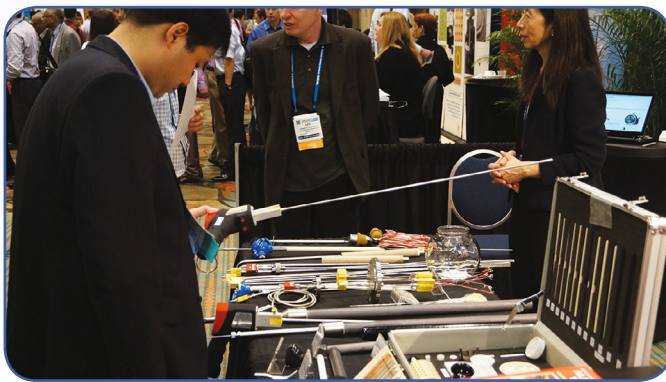
Welcome Home: Making Connections at TMS2015



Several hundred people gathered at the TMS2015 Opening Celebration to connect and look ahead to the week's events.



Elizabeth Holm, 2013 TMS President and organizing chair of Diversity in the Minerals, Metals, and Materials Professions (DMMM1) Summit, sponsored by TMS in July 2014, highlighted the themes and recommendations that emerged from that event at the TMS2015 Women in Science Breakfast. Some of these points were then used as conversation starters in the networking session that followed her remarks.



A series of networking events kept the TMS2015 Exhibition lively as attendees connected with the expertise offered by more than 100 exhibitors.

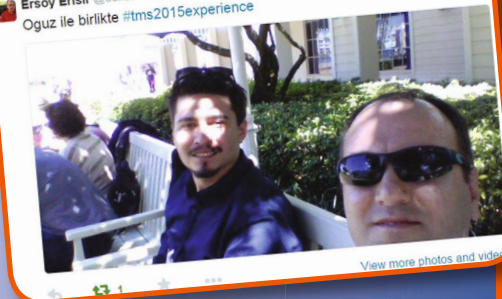


TMS 2015

TMS retweeted
Pello Uranga @puranga · Mar 16
First time being a Mentor at a TMS conference! Great experience! Great people! #TMS2015Experience

TMS retweeted
Euan Wielewski @euanwielewski · Mar 21
Back in the UK after a fantastic #TMS2015Experience! Looking forward to next years @TMSociety conference in Nashville!

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Oguz ile birlikte #tms2015experience



The #TMS2015 Young Professional Experience

Young Professional Honorees Focus on the Next Generation



Peter Hosemann, University of California, Berkeley, discusses how young students become interested in materials science and engineering.



Antoine Allanore, Massachusetts Institute of Technology, gives an overview of the Sustainable Chemical Metallurgy class that he teaches.

Inspiring today's young minds about science and engineering was a common theme running through both lectures presented at the TMS2015 Young Professional Tutorial Luncheon by the 2015 recipients of the TMS Early Career Faculty Fellow Award.

Peter Hosemann, associate professor, Department of Nuclear Engineering, University of California, Berkeley, examined when and how students become interested in materials science and engineering. He noted that most students develop an initial interest in STEM (science, technology, engineering, and mathematics) subjects as early as kindergarten. Of those interested in these fields from pre-kindergarten to fifth grade, most students did not link their interest to a specific event, but rather to a general interest in taking things apart and putting them back together—garage tinkering, as Hosemann called it—according to a 2014 study published in *Science Education*. Hosemann concluded his lecture with the recommendation that more public education and outreach should be conducted to better inform students and the general public about materials science and engineering.

Antoine Allanore, Thomas B. King Assistant Professor of Metallurgy at Massachusetts Institute of Technology (MIT), followed with an overview of a sustainable chemical metallurgy course that he has designed. His approach, he

explained, is to use real-world examples of the impact of metals and materials on society, while also discussing environmental consequences of metal extraction. “The purpose of the class is to remind students of what they learned in other classes and put it into a context that they can relate to and understand,” Allanore said.

Young Professional Poster Contest Awardees

Congratulations to the following authors for receiving best poster honors in the 2015 TMS Technical Division Young Professional Poster Contest:

Functional Materials Division

Fan-Yi Ouyang and Wei-Neng Hsu, National Tsing Hua University: “Effects of Anisotropic Beta-Sn Alloys on Cu Diffusion under a Temperature”

Light Metals Division

William Wang, Pennsylvania State University, et al.: “Formation of Long Periodic Stacking Ordered Structures (LPSOs) in Mg-Zn-Y Alloys Through Inversed Martensite Transformation”

Materials Processing & Manufacturing Division

Jiwon Park, Korea Institute of Materials Science, et al.: “Mathematical Modeling of the Effect of Silica Reduction Kinetics in ladle and Continuous Casting Processes”

Structural Materials Division

M. Arul Kumar, Los Alamos National Laboratory: “Modeling of Shear Transformation Induced Deformation Behavior in Crystalline Materials”

Speed Mentoring Becomes a Fast Favorite

Meet a Mentor, a new event for TMS2015, offered young professionals the chance to network with more experienced TMS members. To better match mentees with mentors, participants were asked to complete a questionnaire about their professional interests in advance. Attendees were then scheduled for a series of eight five-minute meetings with others who had similar backgrounds, research interests, or career goals. The intent of the program was to cultivate contacts leading to mentoring relationships, exchange of research, or even a job interview. Nilesh Kumar, a postdoctoral researcher at the University of North Texas, remarked, “In a very short period of time I got to meet many people.”

Many participants in this year’s event planned on following up with connections they made after TMS2015 had concluded. “I really enjoyed the event, especially the attitude of young mentees who were willing to learn from our experiences and seek advice for their careers,” said Pello Uranga, University of Navarra. Gregory Hildeman, 2004 TMS President, was also pleased with his mentoring experience. “The session was a terrific opportunity to meet young leaders at an early stage of their career in materials science,” he said.

“My main message to them was to become active in TMS and take advantage of the many networking opportunities.”

“I totally recommend anybody attending the next TMS conference to get involved in this type of activity and help young researchers with your experience and advice,” Uranga added. “We received (and are receiving) a lot from TMS. Now it is time to

give back.”

The Young Professionals Networking Reception, held immediately after Meet a Mentor, presented attendees with the chance to network in a more relaxed setting. Conversation flowed freely with attendees discussing everything from the results of the Materials Bowl, to getting more men involved in the TMS Diversity Committee, to networking opportunities for young professionals. “Networking is the number-one reason to come to a TMS annual meeting,” said Megan Cordill, Group Leader, Erich Schmid Institute. “For me, it’s flying in to see my research friends.”



Nilesh Kumar, University of North Texas, makes positive professional connections at the TMS2015 Meet a Mentor event.

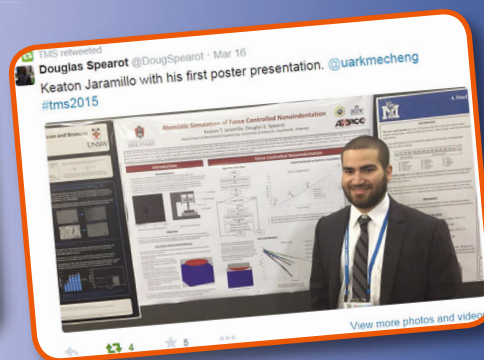


Another popular networking opportunity for young professionals at TMS2015 was the Meet the Candidate Poster Session. The event provided them with a venue for presenting their qualifications to potential employers.



Catching up at the Young Professionals Networking Reception (from left): Christopher O'Brien, Sandia National Laboratories, Kristy Tippey, Colorado School of Mines, Gerald Onyedika, Federal University of Technology, Owerri, and Megan Cordill, Erich Schmid Institute.

TMS 2015



The #TMS2015 Student Experience

Student-Organized Symposium Makes Science Accessible

“I’ve never been an organizer before, so I was nervous. It’s a big responsibility,” said Kevin Chaput, Purdue University graduate student, of his experience as one of the organizers for Messaging Research to a Broad Audience, the first TMS student-run symposium. Despite first-time concerns, Chaput and his fellow organizers and Purdue classmates, Andrew Kustas, Kathlene Reeve, and Lisa Rueschhoff, were enthusiastic about their topic and speakers. “We wanted to have high-impact talks to interest a wide audience, and we were fortunate to get an exciting lineup of presenters,” said Chaput.

The symposium featured talks on materials science in comic books, preparing grants and proposals, and removing scientific jargon to make information accessible to the public, as well as many other topics pertinent to communicating scientific research.

Chaput is particularly excited to see how this symposium evolves in the future. “It allows for such an interesting dynamic at TMS,” he said. “I’m glad the student-run symposium has been started and am honored to have been an organizer of the first symposium.”

Materials Bowl Crown Returns to Colorado

A total of 11 university teams competed in the ninth annual TMS Materials Bowl. The four energetic elimination rounds and two intense semi-final rounds led

to a closely matched championship showdown, pitting the Georgia Institute of Technology “Wreckers” against the Colorado School of Mines (CSM) “Orediggers.” The CSM team was once again crowned Materials Bowl Champion, making 2015 the fifth win for CSM since the competition began in 2007. Other schools represented in the competition were: Boise State University, Drexel University, University of Alabama, Birmingham, University of Alabama, Tuscaloosa, University of British Columbia, University of Florida, University of North Texas, University of Puerto Rico, University of Utah, and Virginia Institute of Technology.



The 2015 Materials Bowl champions, from Colorado School of Mines, (left to right): Blake Whitley, Andrea Bollinger, Emily Mitchell, and Connor Campbell with 2014 TMS President Hani Henein.

Helpful Advice from the Student Career Forum

How to choose a career path, network effectively, and weigh the decision to attend graduate school were among the many student questions explored by a panel of seven young professional members at the TMS2015 Student Career Forum. What follows is a sampling of some of the advice that they shared with the mostly undergraduate audience, based on their own backgrounds, experiences, and current point in their careers:



"Really, what school does is teach you how to think and how to look for answers. It's not so much about becoming an expert in the field, but getting the foundation in learning how to learn."

—Steve Coryell

"Companies really like to find good talent. If we like you, it doesn't matter if you're straight out of school or experienced. Knowledge transfer is a huge issue right now with so many people retiring, so we need people to fill with knowledge."

—Ayesha Gonsalves

"Just having the knowledge that you have exponentially increased the number of people you know in the community helps you so much."

—Michele Manuel

"The crucial thing is to make some sort of connection with someone wherever you want to work."

—Lauren Garrison

"If you're thinking about graduating in 1 ½–2 years, it's probably a good idea to have a resume prepared, so when the job openings happen you are ready to go."

—John Carpenter

Meet the Student Career Forum panelists (left to right): Michele Manuel, University of Florida; Lauren Garrison, Oak Ridge National Laboratory; Steve Coryell, Special Metals Corporation; John Carpenter, Los Alamos National Laboratory; Charlie Monroe, University of Alabama, Birmingham; Ayesha Gonsalves, GE Global Research Center; Mingming Zhang, ArcelorMittal Global R&D

Student Poster Contest Winners

Congratulations to the following students for receiving best poster honors in the 2015 TMS Technical Division Student Poster Contest:

Best of Show Winners

(Note: The following two posters also won their categories in the Structural Materials Division poster competition)

Undergraduate:

Aarthi Sridhar, Harvey Mudd College, et al.: "Microstructure, Phase Evolution and Properties of High Entropy Brasses and Bronzes"

Graduate:

Jason Geathers, University of Michigan, et al.: "Investigating Small Fatigue Crack Growth Behavior in Ti-6242S Using Ultrasonic Fatigue and Scanning Electron Microscopy"

Extraction & Processing Division

Undergraduate:

Luis Laracuente, University of Puerto Mayagüez, et al.: "Photo-degradation of Atrazine with Recycled Glass Filter Functionalized with TiO₂"

Graduate:

Alexandra Anderson, Colorado School of Mines, et al.: "Carbochlorination of Cerium Oxide"

Functional Materials Division

Undergraduate:

Ravi Konjeti, Georgia Tech Research Institute, et al.: "Development of Circuit Integrated Carbon Nanotube Supercapacitors within Doped Silicon Wafers"

Graduate:

Jui-Shen Chang, National Tsing Hua University, et al.: "Phase Equilibria of Pb-Sb-Se Ternary Thermoelectric Material System"

Light Metals Division

Undergraduate:

Matthew Wener, University of Florida, et al.: "Recrystallization of a Biodegradable Mg-Ca-Sr Alloy"

Graduate:

Ulises Barajas, University of Puerto Rico, et al.: "Study of Aluminum Matrix Composite (AMC) Used in the Deposition of Thin Films by RF Sputtering Magnetron"

Materials Processing & Manufacturing Division

Undergraduate:

Nicholas Suhar, University of Florida, et al.: "Characterization of Ni₂TiSn Full-Heusler Precipitates in NiTi Based Shape-Memory Alloys for Actuator Applications"

Graduate:

Tara Power, McMaster University, et al.: "Ab-initio Simulations of Al-Si based Alloys in the Liquid State"

