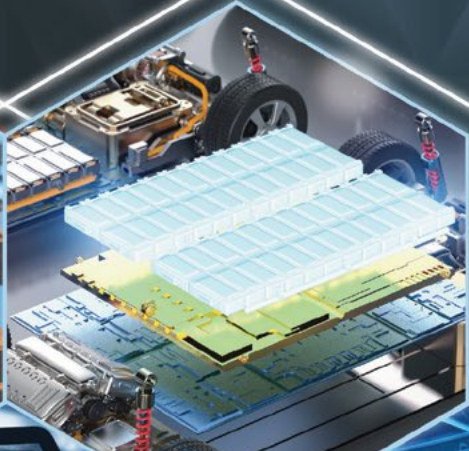


JOM

FEBRUARY 2024
www.tms.org/JOM

// An official publication of The Minerals, Metals & Materials Society



75 CELEBRATING
75 YEARS OF
JOM

TMS

 Springer

2024



Offshore Technology Conference

JOIN THE CONVERSATION ON THE PROGRESS
OF FUTURE OFFSHORE PROJECTS

Be at the Forefront of Energy Technologies and Innovations

REGISTER TO ATTEND

go.otcnet.org/JOM

6-9 May 2024 >> NRG Park >> Houston, Texas, USA

#OTC2024



5700 Corporate Drive
 Suite 750
 Pittsburgh, PA 15237
 USA
 Phone: 1-724-776-9000
 Web: www.tms.org/JOM
 E-mail: membership@tms.org

Publisher for TMS

James J. Robinson,
 Executive Director

Operations Management

Matt Baker,
 Department Head, Content

JOM: The Journal

Kelly Markel,
 Publications Managing Editor

Victoria M. Miller,
 Associate Editor

Fiseha Tesfaye,
 Associate Editor

JOM: The Magazine

Ashley-Anne Bohnert,
 Department Head,
 Marketing and
 Communications

Kelly Zappas,
 JOM: The Magazine Editor

Cheryl M. Geier,
 Senior Graphic Designer

Contributing Writers

Megan Enright,
 Marketing Administrator

Jillian Schultz,
 Digital Engagement
 Specialist

Graphics Support

David Rasel,
 Senior Manager,
 Brand and Digital Assets

Bob Demmler,
 Visual Communications
 Coordinator

Advertising

TMS Sales Team
 Phone: 1-724-814-3174
 Email: sales@tms.org




GUEST EDITORS

February 2024 Guest Editors

Advanced Functional and Structural Thin Films and Coatings

Thin Films and Interfaces Committee

Nuggehalli Ravindra, New Jersey Institute of Technology;

Adele Carradó, University of Strasbourg;

Karine Mougín, Mulhouse Materials Science Institute;

Ramana Chintalapalle, University of Texas-El Paso;

Gerald Ferblantier, University of Strasbourg

Characterization of Interactions between Materials and External Fields

Materials Characterization Committee

Zhiwei Peng, Central South University

Deformation-Assisted Pathways to Microstructural Manipulation

Phase Transformations Committee and Shaping and Forming Committee

Bharat Gwalani, North Carolina State University;

Arun Devaraj, Pacific Northwest National Laboratory;

Eric Lass, The University of Tennessee, Knoxville

About the Cover

The five cover images represent the five technical divisions of The Minerals, Metals & Materials Society: Extraction & Processing, Functional Materials, Light Metals, Materials Processing & Manufacturing, and Structural Materials. In representing the five technical divisions, *JOM: The Journal* balances the interests of its members and authors in the monthly topics and articles it publishes.

About JOM:

The scope of *JOM* (ISSN 1047-4838) encompasses publicizing news about TMS and its members and stakeholder communities and publishing high-quality peer-reviewed materials science and engineering content. That content includes groundbreaking laboratory discoveries, the effective transition of science into technology, innovative industrial and manufacturing developments, resource and supply chain issues, improvement and innovation in processing and fabrication, and life cycle and sustainability practices. In fulfilling this scope, *JOM* strives to balance the interests of the laboratory and the marketplace by reporting academic, industrial, and government-sponsored work from around the world.

About TMS:

The Minerals, Metals & Materials Society (TMS) is a professional organization that encompasses the entire range of materials and engineering, from minerals processing and primary metals production to basic research and the advanced application of materials.

Publishing Information:

JOM is an official publication of The Minerals, Metals & Materials Society and is owned by the Society. TMS has granted Springer the exclusive right and license to produce, publish, archive, translate, and sell *JOM* throughout the world. Publication Frequency: 12 issues per year. Springer, 1 New York Plaza, Suite 4600, New York, NY 10004-1562, USA
JOM articles from 1949 to the present are archived at
<https://link.springer.com/journal/11837/volumes-and-issues>

Secure Copyright Permission:

Submit permission requests at <http://www.springer.com/rights?SGWID=0-122-12-372399-0>.

Postmaster:

Send address changes to: *JOM*, Springer Nature, 200 Hudson Street, Harborside Plaza 2, Suite 503, Attn: Mailroom, Jersey City, NJ 07302, USA. Periodicals postage paid at New York, NY and additional mailing offices.

// FEATURES

- 6:** TMS Welcomes New Members in October and December 2023: Jillian Schultz
- 11:** A Closer Look at the TMS2024 Proceedings Volumes: Kaitlin Calva
- 15:** Not Your Average Training Program: TMS Members Go Above and Beyond at ELA Training Conference: Kaitlin Calva
- 16:** A Student's Guide to TMS2024: Kelly Zappas
- 19:** Congratulations to the 2024 Class of TMS Scholars: Jillian Schultz

// DEPARTMENTS

- 3:** In the Final Analysis: James J. Robinson
- 4:** JOM Technical Topics
- 23:** TMS Meeting Headlines

IN THE FINAL ANALYSIS

"I am writing a treatise just now' said the badger, . . . 'Perhaps you would like to hear it? It's for my doctor's degree you know,' he added hastily, before Wart could protest. He got few chances of reading his treatise to anybody, so he could not bear to let the opportunity slip by."

—T.H. White, *The Once and Future King*

The Once and Future King is nestled snugly on one of my nearby bookshelves, resting next to such indispensable favorites as *Catch-22*, *Cat's Cradle*, and *American Gods*. White's novel is the story of a boy nicknamed "Wart." With Merlin the Magician as his mentor and tutor, Wart makes friends, gains insights, and accumulates knowledge such that he becomes worthy to pull the sword "Excalibur" from a stone and become King Arthur. There are, of course, many, many tales of King Arthur, including *Monty Python and the Holy Grail*, which is nestled snugly on my video shelves next to . . . well, that's a different editorial.

I suspect that the tale of Wart becoming Arthur may have particular resonance with many in the TMS community. Read as a parable, the novel is effectively a celebration of education—a young hero, under the difficult-to-appreciate guidance of a scholarly sage, gains unique perspectives and experiences that equip him to be an ethical, effective, and resourceful leader. Sounds a lot like being a graduate student, right?

As graduate students prepare to pull the metaphorical Ph.D. sword from the stone, they benefit from the uplifting hands of many supporters. TMS has long endeavored to be among those sympathetic hands by offering programs specifically designed to assist students. These are housed within the exceptional Material Advantage program. TMS also offers scholarships, student poster contests, networking events, the Materials Bowl, and the Bladesmithing competition. (Did someone say "Excalibur"?) While this is an engaging suite of benefits, it does have a certain one-size-fits-all approach to graduates and undergraduates alike. So, TMS is introducing a new program that recognizes the notable differences between student groups.

The TMS Graduate Student Membership Program is separate from Material Advantage, viewing a Graduate Student Member as holding a form of professional TMS membership. All professional members are voted by the TMS Board of Directors for membership and that will apply to Graduate Student Members as well. This is a professional distinction, and the inducted graduates may participate in TMS activities that customarily require professional membership. Most notably, this means Graduate Student Members may hold full membership on TMS committees. This is substantial as TMS committees, especially technical committees, set the programs for our events and fill a wide variety of volunteer roles that create policy and practice for the Society. These can be impressive entries on one's C.V.

It is only wisdom that Graduate Student Members have input on how Society events are programmed—roughly a third of registrants for the TMS Annual Meeting & Exhibition are graduate students. The Society needs their voices. There are also more expansive opportunities for graduate students to network with peers and well-known members of the community. All should prove beneficial to Graduate Student Members as they prepare to launch job searches.

You will see more about this new program during TMS2024 as we expect about 1,500 graduate students to be in attendance. There will be a fee to join, but it is nominal—a one-time payment of \$75 that encompasses the totality of one's years as a graduate student. After that, a year of complimentary professional membership follows. That may not be our best dollars-and-cents decision, but it is a great one for advancing the Society's mission.



James J. Robinson
Executive Director



"The TMS Graduate Student Membership Program is separate from Material Advantage, viewing a Graduate Student Member as holding a form of professional TMS membership."

Find peer-reviewed technical articles covering the full range of minerals, metals, and materials science and engineering in the February issue of *JOM: The Journal*. Each issue features several technical topics presenting a series of related articles compiled by guest editors. A preview of February technical topics and articles are listed below. TMS members can log in to www.tms.org/Journals for full access to technical articles from *JOM: The Journal* and additional TMS journals.

Below is a sample of articles that will appear in the February issue, based on information available at press time. For the most up-to-date article listing, visit www.tms.org/JOM.

FEBRUARY 2024

Advanced Functional and Structural Thin Films and Coatings

Editors: **Nuggehalli Ravindra**, New Jersey Institute of Technology; **Adele Carradò**, University of Strasbourg; **Karine Mougín**, Mulhouse Materials Science Institute; **Ramana Chintalapalle**, University of Texas-El Paso; **Gerald Ferblantier**, University of Strasbourg

Sponsor: Thin Films and Interfaces Committee

"Advanced Functional and Structural Thin Films and Coatings and Honorary Palkowski Session," **Adele Carradò**, et al.

"Corrosion Protection of Mild Steel Using ZnO/NiO Pigment-Based Epoxy Coating," **Akash G. Mahajan**, et al.

"Enhanced Thermal Stability and Corrosion Resistance of UV-Curing Epoxy Acrylate Coatings by Incorporating Mica," **Yaling Da**, et al.

"Effect of Cu Doping on Structural, Optical, and Electrical Properties of Sn₂S₃ Thin Films Prepared by Spray Pyrolysis," **B.S. Nagaraja**, et al.

"Surface Improvement of Ti-6Al-4V Alloy by Deposition of AlCrCoFeMnNi High Entropy Alloy Using TIG Process," **Falih Alazzawi**, et al.

"Preparation and Corrosion Resistance of Silicate Phosphate Composite Passivation Film on Zinc Substrate by Simple Chemical Impregnation Method," **Yanshaozuo Zhu**, et al.

"Electrodeposition and Characterization of Fe-P Coating Applied onto Mild Steel Substrate," **Arman Zarebidaki**, et al.

"Formation of GdAl₂ Laves Phase in Gadolinium Zinc Oxide Epitaxy Film," **M.M. Zeidan**, et al.

Characterization of Interactions between Materials and External Fields

Editor: **Zhiwei Peng**, Central South University

Sponsor: Materials Characterization Committee

"Alignment of Two-Phase Microstructures in Fe-0.155 Mass% C Alloy by Applying High Magnetic Field Gradients During Austenitic Decomposition," **Chaojie Yan**, et al.

"Thermodynamic Analysis of Sulfurization of Ferronickel," **Jiang Cao**, et al.

"Is it Possible to Use Breakage Models for Predicting Particle Deformation?" **R.G. Hamey**, et al.

"Realizing the Ultrafast Homogenization of Bearing Steel Based on Solute Atom Diffusion Under Pulsed Electric Current," **Zhongxue Wang**, et al.

"Evolution of Lamellar α in Ti6242S Ti-Alloy After β -Forging Combined with Two-phase Zone Heat Treatment," **Yu Wang**, et al.

"Recovery of Platinum Group Metals from Spent Automobile Exhaust Catalysts," **Jinxi Qiao**, et al.

"Numerical Investigation of Residual Stress Field Induced by Array-Type Laser Shock Peening," **K. Abhishek**, et al.

"Effect of Pulsed Magnetic Field on Microstructure and Mechanical Properties of 7050 Al Alloy After Two-Stage Aging," **Jin-Xin Zhou**, et al.

Deformation-Assisted Pathways to Microstructural Manipulation

Editors: **Bharat Gwalani**, North Carolina State University; **Arun Devaraj**, Pacific Northwest National Laboratory; and **Eric Lass**, The University of Tennessee, Knoxville

Sponsors: Phase Transformations Committee and Shaping and Forming Committee

"New Generation Wrought Al-Ca-Mg Natural Composite Alloys as an Alternative to the 5000 Series Alloys," **T.K. Akopyan**, et al.

"Effect of Induced Martensite Content on Microstructure Evolution and Mechanical Properties of Ferritic Stainless Steel," **Pengguang Ma**, et al.

"Mechanical Properties of Al-9Si-0.6Mg-0.1Sr Alloy Processed by Successive Hot and Cold Multi-directional Forging," **Sadun Karabiyik**, et al.

"Optimization of Process Parameters of Hot Consolidated Steel Matrix Composites by Taguchi Method," **Silani Sahoo**, et al.

"Processing an 18Cr-8Ni Austenitic Stainless Steel Without the Dilemma of the Strength and Ductility Trade-Off," **Chengjie He**, et al.

"Effect of Heat Treatment on Microstructure of $Al_{0.78}CoCrFeNi$ Alloy Fabricated by Laser Additive Manufacturing," **Xiaowu Nie**, et al.

View More Technical Articles

JOM regularly publishes additional articles that fit within the scope of the journal, but not within the scope of a particular technical topic. Read these in the "Technical Articles" section of *JOM* on Springer.



TMS Welcomes New Members in October and December 2023

Jillian Schultz

The TMS Board of Directors approved professional membership for the following individuals at its October and December 2023 meetings. Please join us in congratulating and welcoming them to all the privileges and benefits of TMS membership.

Approved October 2023

Abolhasani, Atekeh; Canada	Alzaabi, Hamad Ali; Emirates Global Aluminium, United Arab Emirates	Dorin, Thomas; Deakin University, Australia
Aguero, Viviana; United States	Amani Bani, Omid; Iran, Islamic Republic of	Dzivenu, Perry; Volta Aluminum Company, Ghana
Al Hattali, Mohamed Saleh Hamad; Emirates Global Aluminium, United Arab Emirates	Andrews, Justin; Purdue University, United States	Escobar, Julian; Pacific Northwest National Laboratory, United States
Al Lawati, Zakariya; Sohar Aluminium, Oman	Artcher, Elikplim; Volta Aluminum Company, Ghana	Eun, Jonghyun; Arizona State University, United States
Al Taheri, Mahdi; Emirates Global Aluminium, United Arab Emirates	Bin Kalban, Nasser Abdulla; Emirates Global Aluminium, United Arab Emirates	Fakhimalizad, Amin; Colorado Department of Transportation, United States
Aladab, Ahmed Saifan; Emirates Global Aluminium, United Arab Emirates	Bradley, Edwin; Motorola, United States	Follett-Figueroa, Michael; United States
Alakberi, Abdulaziz; Emirates Global Aluminium, United Arab Emirates	Brice, Craig; Colorado School of Mines, United States	Galbraith, James; Oceaneering Space Systems, United States
Aljaberi, Fatima Obaid; Emirates Global Aluminium, United Arab Emirates	Campbell, Jeff; Materion, United States	Gatto, Christine; United States
Aljasmi, Auhood; Emirates Global Aluminium, United Arab Emirates	Chan, Helen; Lehigh University, United States	Geathers, Jason; Exponent, United States
Almarri, Suhail; Emirates Global Aluminium, United Arab Emirates	Chapman, James; Boston University, United States	Gilmer, Dustin; United States
Alshuhail, Humaid Saeed; Emirates Global Aluminium, United Arab Emirates	Chaudhary, Rajneesh; United States	Grejtak, Tomas; Oak Ridge National Laboratory, United States
Altamimi, Ali Mohammed; Emirates Global Aluminium, United Arab Emirates	Chojaczyk, Agnieszka; Reel Norway AS, Norway	Guarino, Vincent; Phillips 66, United States
	Coley, Michael; University of the West Indies, Jamaica	Gutierrez Lopez, Romeld; Bolivia
	Deles-Stagner, DeeAnn; The Boeing Company, United States	Hamad Aldahmani, Roudah Salem; Emirates Global Aluminium, United Arab Emirates

<p>Hasannaemi, Vahid; Solar Turbines, United States</p> <p>Hoffmann, Dillon; United States</p> <p>Hu, Jiamian; University of Wisconsin-Madison, United States</p> <p>Huebner, Benjamin; United States</p> <p>Hughes, Paul; Subsea7, United States</p> <p>Idris, Zulkifli; Hydro Aluminium, Norway</p> <p>Jaffe, Adam; ARUP Laboratories, United States</p> <p>Jaramillo, Lucy; HDR, United States</p> <p>Jedeck, Stefan; Hydro Aluminium, Germany</p> <p>Jones, Philip; Hatch, United Arab Emirates</p> <p>Kajatt, Sami; Tecnofil, Peru</p> <p>Kennelley, Kevin; Kennelley & Associates, LLC, United States</p> <p>Khalfan Ali, Ghedayer Hamad; Emirates Global Aluminium, United Arab Emirates</p> <p>Kroh, Andrew; Panadyne Inc, United States</p> <p>Kumar Karahe, Shirish; Emirates Global Aluminium, United Arab Emirates</p>	<p>Lu, Dongping; Pacific Northwest National Laboratory, United States</p> <p>Mahmoud, Mohamed Osman; Emirates Global Aluminium, United Arab Emirates</p> <p>Mangalagiri, Chandanadas; Reel India Services Private Limited, India</p> <p>Mustafa, Mohamad Abdallah; Emirates Global Aluminium, United Arab Emirates</p> <p>Norkett, Justin; Naval Surface Warfare Center, Caderock Division, United States</p> <p>O'Malley, Ronald; Missouri University of Science and Technology, United States</p> <p>Otte, Otho; Principia College, United States</p> <p>Park, Jiyun; United States</p> <p>Ratschbacher, Karin; GfE Metals and Materials GmbH, Germany</p> <p>Ritchie, Porter; United States</p> <p>Roy, Indranil; DAMORPHE, United States</p> <p>Schaub, Erik; United States</p> <p>Scott, Todd; Fort Wayne Metals, United States</p>	<p>Seaton, Simon; Society of Petroleum Engineers, United States</p> <p>Seebeck, Megan; Materials ES LLC, United States</p> <p>Shaikh, Riyaz Ahmed; REEL International, United Arab Emirates</p> <p>Shakiba, Maryam; University of Colorado, United States</p> <p>Sommerfeldt, Stefan; Hydro Aluminium, Norway</p> <p>Stevens, Harrie; Alfred University, United States</p> <p>Stewart, Calvin; Ohio State University, United States</p> <p>Tingler, Kevin; Helmerich & Payne, United States</p> <p>Tsukada, Masayuki; IHI Corporation, Japan</p> <p>Valdant, Severine; QuesTek Innovations LLC, United States</p> <p>Velazquez, Andrea; Scientific Control Laboratories, Inc., United States</p> <p>Wadayama, Toshimasa; Tohoku University, Japan</p> <p>Yang, Liuqing; University of North Carolina at Charlotte, United States</p> <p>Zhang, Boliang; United States</p>
--	--	---

Approved December 2023

<p>Abadeer, Nardine; Owens Corning, United States</p> <p>Abolghasem, Sepideh; California State University, Northridge, United States</p> <p>Achmad, Tria; Bandung Institute of Technology, Indonesia</p> <p>Agyapong, Joseph; York University, Canada</p> <p>Ahluwalia, Rajeev; Institute of High Performance Computing, Singapore</p>	<p>Ahn, Hyunchul; Yeungnam University, Korea, South</p> <p>Alleyne, Fatima; BeyondDEIBA, United States</p> <p>Almutairi, Badriah; Princess Nourah Bint Abdul Rahman University, Saudi Arabia</p> <p>Alsari, Husain; Alba</p> <p>Alvarez, Noe; University of Cincinnati, United States</p> <p>Atwater, Mark; Liberty University, United States</p>	<p>Avila, Jose; Washington State University, United States</p> <p>Aziziha, Mina; University of South Carolina, United States</p> <p>Bahk, Je-Hyeong; University of Cincinnati, United States</p> <p>Barbosa Toribio, Oliver; Novelis - Pindamonhangaba, Brazil</p> <p>Barnett, Blake; United States Army Combat Capabilities Development Command Army Research Laboratory, United States</p>
--	---	--

Bestic, Michael; Swagelok, United States	Dahal, Manisha; Boston Metal, United States	Hall, Lisa; The Ohio State University, United States
Bhadhon, Kazi; McMaster University, Canada	Daniszewski, Ashley; National Energy Technology Laboratory, United States	Han, Bing; SLB, United States
Bhati, Manav; Schrodinger, United States	De, Shuvodeep; Oak Ridge National Laboratory, United States	Hansinger, Rick; Thermal Technology, United States
Bhatt, Sagar; Argonne National Laboratory, United States	Dean, David; The Ohio State University, United States	Hardouin Duparc, Olivier; CNRS, France
Bhave, Chaitanya; Idaho National Laboratory, United States	DeCost, Brian; National Institute of Standards and Technology, United States	Hassan, Musharaf; Pakistan
Bidthanapally, Rao; Oakland University, United States	Dixon Wilkins, Malin Christian John; Washington State University, United States	Heckler, James; ARCTOS, United States
Bonidie, Matt; Kennametal, United States	Duchek, Michal; COMTES FHT a.s., Czech Republic	Hill, Leon; GKN Aerospace, United States
Boyko, Ihor; Metinvest Polytechnic, Ukraine	Economy, Jessica; Boise State University, United States	Hilla, Colleen; Savannah River National Laboratory, United States
Cantonwine, Sara; Space Exploration Technologies, United States	El Fray, Miroslawa; West Pomeranian University of Technology, Poland	Hodapp, Max; Materials Center Leoben, Austria
Carlson, Krista; University of Nevada, Reno, United States	Feurer, Matthew; United States Army, United States	Hoffman, Nick; United States Army Benét Laboratories, United States
Cassese, Andrew; United States	Fleming, Nathan; Weldaloy Specialty Forgings, United States	Hrudkina, Nataliia; Metinvest Polytechnic, Ukraine
Champion, David; A-Dec, United States	Forzley, Alfred; Lockheed Martin, United States	Hsu, Fu-Yuan; National United University, Taiwan
Chang, Kunok; Kyung Hee University, Korea, South	Fujieda, Tadashi; Proterial, Ltd., Japan	Idczak, Rafal; University of Wroclaw, Poland
Chilkoti, Ashutosh; Duke University, United States	Fukao, Tomohiro; Panasonic Industry, United States	Illing, Cyprian; Swagelok, United States
Chinapareddygari, Teena; Indira Gandhi Centre for Atomic Research, India	Gaskey, Bernard; Los Alamos National Laboratory, United States	Iuvancigh, Brian; Fluor, United States
Cho, Daehyun; The Ohio State University, United States	Gautam, Amrita; University of West Florida, United States	Jang, Je-Wook; POSCO, Korea, South
Choi, Wonjune; United States	Georgin, Benjamin; Exponent, United States	Janicki, Tesia; Sandia National Laboratories, United States
Cicotte, Joshua; GE Research, United States	Ghosh, Ayana; Oak Ridge National Laboratory, United States	Jeyamohan, Rajaguru; University of Virginia, United States
Copping, Joanne; United Kingdom	Gupta, Anju; University of Toledo, United States	Jiang, Wen; North Carolina State University, United States
Coury, Francisco; Universidade Federal de São Carlos, Brazil		Joshi, Sameehan; United States
Croom, Brendan; Johns Hopkins University Applied Physics Laboratory, United States		Jun, Byung-Hyuk; Korea Atomic Energy Research Institute, Korea, South
Daffron, Mary; Johns Hopkins University Applied Physics Laboratory, United States		Kang, SeungYeon; University of Connecticut, United States

<p>Kasemer, Matt; The University of Alabama, United States</p>	<p>Lin, Huey Jiuan; National United University, Taiwan</p>	<p>Musa, Md Rajib Khan; Villanova University, United States</p>
<p>Kauffmann, Alexander; Karlsruhe Institute of Technology, Germany</p>	<p>Lorentz, Donald; Naval Nuclear Laboratory - Bettis Atomic Power Laboratory, United States</p>	<p>Nam, Seunghyoun; Hyundai Construction Equipment, Korea, South</p>
<p>Kim, Byung-Joo; Korea Institute of Materials Science, Korea, South</p>	<p>Luna, Victoria; University of Texas at El Paso, United States</p>	<p>Naser, Sayed Mohamed; Fives Services Gulf, Bahrain</p>
<p>Kim, Jaegyung; University of California, Berkeley, United States</p>	<p>Mahmoud, Morsi; King Fahd University of Petroleum and Minerals, Saudi Arabia</p>	<p>Nautiyal, Pranjal; Oklahoma State University, United States</p>
<p>Kim, Philseok; ARPA-E, U.S. Department of Energy, United States</p>	<p>Malakkal, Linu; Idaho National Laboratory, United States</p>	<p>Neils, Andrew; Roux Institute at Northeastern University, United States</p>
<p>Kindred, Jack; CAS Registry Number, United States</p>	<p>Marques Azevedo, Marcelo; Brazil</p>	<p>Nichols, Patricia; Tosoh SMD, United States</p>
<p>Klein, Ryan; National Renewable Energy Laboratory, United States</p>	<p>Marthi, Rajashekhar; Cornell University, United States</p>	<p>Nitol, Mashroor; Los Alamos National Laboratory, United States</p>
<p>Koenig, Alicia; Lehigh University, United States</p>	<p>Mayer, Lydia; Idaho National Laboratory, United States</p>	<p>Olubambi, Peter; University of Johannesburg, South Africa</p>
<p>Kong, Junghyun; POSCO, Korea, South</p>	<p>McClure, Cyler; Tosoh SMD, United States</p>	<p>Oluwafemi, Temitope; Bodycote, United States</p>
<p>Kulkarni, Ajit; Indian Institute of Technology Bombay, India</p>	<p>Mckinney, Conor; Weldaloy Specialty Forgings, United States</p>	<p>Page, Matthew; Savannah River National Laboratory, United States</p>
<p>Kumar, Jayanthi; Oak Ridge National Laboratory, United States</p>	<p>Menon, Aishwarya; Purdue University, United States</p>	<p>Panda, Dillip; Clemson University, United States</p>
<p>Landgraf, Fernando; University of São Paulo, Brazil</p>	<p>Miao, Jiashi; The Ohio State University, United States</p>	<p>Pandey, Vikas; Fives Services Gulf, Bahrain</p>
<p>Laviola Rodrigues de Freitas, Remulo; Anglo American Niquel Basil Ltda, Brazil</p>	<p>Mihara Narita, Mami; Nagoya Institute of Technology, Japan</p>	<p>Park, Junho; POSCO, Korea, South</p>
<p>Lech, Sebastian; Johns Hopkins University, United States</p>	<p>Mishin, Yuri; George Mason University, United States</p>	<p>Pashynska, Olena; Metinvest Polytechnic, Ukraine</p>
<p>Lei, Shu Chiang; NAVAIR, United States</p>	<p>Miyamoto, Goro; Tohoku University, Japan</p>	<p>Pashynskiy, Volodymyr; Metinvest Polytechnic, Ukraine</p>
<p>Li, Xiao; University of North Texas, United States</p>	<p>Mohsin, Hamza; Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Palestine, State of</p>	<p>Peng, Jie; United States</p>
<p>Lieberman, Evan; Los Alamos National Laboratory, United States</p>	<p>More, Santosh; Faraday Technology, United States</p>	<p>Pooley, Andrew; United Kingdom</p>
<p>Lifton, Jack; Jack Lifton, LLC, United States</p>	<p>Mujica Roncery, Lais; Pedagogical and Technological University of Colombia, Colombia</p>	<p>Post, Nathan; The Roux Institute at Northeastern University, United States</p>
<p>Lim, Mina; North Carolina State University, United States</p>	<p>Mukhopadhyay, Sharmila; University of Maine, United States</p>	<p>Preston, Alexander; Exponent, United States</p>
		<p>Raja, Krishnan; University of Idaho, United States</p>

Rao, Suraj; Velo3D, United States	Shinde, Vipul; SLB, United States	Van Tyne, Natalie; Virginia Polytechnic Institute and State University, United States
Ren, Shenqiang; University of Maryland, United States	Shirwaiker, Rohan; North Carolina State University, United States	Vogli, Evelina; Flame Spray Inc., United States
Rennie, Ariana; GE Research, United States	Shtoda, Maksym; Metinvest Polytechnic, Ukraine	Von Schaumburg, Michaela; Air Force Research Laboratory, United States
Rida, Ali; Johns Hopkins University, United States	Simon, Carl; National Institute of Standards and Technology, United States	Wangenheim, Christoph; Nikon SLM Solutions, Germany
Riechers, Shawn; Pacific Northwest National Laboratory, United States	Singh, Yogesh; University of Akron, United States	Warusawithana, Maitri; University of North Florida, United States
Rimroth, Trace; Benet Laboratories, United States	Singla, Yogesh; University of Idaho, United States	Watanabe, Masashi; Lehigh University, United States
Rogers, Jeremy; Savannah River National Laboratory, United States	Sneider, Alexandra; Flagship Pioneering, United States	Whitt, Harrison; Tosoh SMD, United States
Rojas, Jairo; National University of Columbia, Colombia	Solem, Cathrine; SINTEF, Norway	Wilhelm, Jay; Ohio University, United States
Roy, Shibayan; Carnegie Mellon University, United States	Song, Danbi; Korea Institute of Machinery & Materials, Korea, South	Wolfe, Kody; Ohio University - Institute for Sustainable Energy and the Environment, United States
Roy, Indranil; GE Research, United States	Song, Rongjie; Idaho National Laboratory, United States	Wu, Hsuan-Chung; Ming Chi University of Technology, Taiwan
Rumi, Mariacristina; Air Force Research Laboratory, United States	Soni, Vishal; University of North Texas, United States	Xia, Xuemeng; Benet Laboratories, United States
Saha, Sujoy; Oakland University, United States	Spinelli, Jose; Federal University of Sao Carlos, Brazil	Xie, Dongyue; Los Alamos National Laboratory, United States
Santosh, S.; Sri Sivasubramaniya Nadar College of Engineering, India	Sudha, J.; Anna University, India	Yang, Wenge; Center for High Pressure Science and Technology Advanced Research, China
Sarrafan, Siavash; Louisiana State University, United States	Suriano, Anne-marie; Rio Tinto, United States	Yoshida, Hideo; ESD Laboratory, Japan
Seetharaman, Venkat; RTX Corporation, United States	Tekol Pelenk, Meryem; Turkey	Yue, Stephen; McGill University, Canada
Seidt, Jeremy; The Ohio State University, United States	Trenda, Guenther; Haba Gmbh, Austria	Zhang, Meng; University of Tokyo, Japan
Shanmugam, Sankaran; Indian Institute of Technology Madras, India	Tsai, Jung-Ting; National Taiwan University of Science and Technology, Taiwan	Zhou, Lin; Ames National Laboratory, United States
Shen, Xiaozhe; SLAC National Accelerator Laboratory, United States	Uchida, Hidetoshi; UACJ Corporation, Japan	
Shibata, Akinobu; National Institute for Materials Science, Japan	Ur Rehman, Muhammad Muneeb; Qadri Group Companies, Pakistan	
	Vajjinath, Prashant; India	

A CLOSER LOOK AT THE TMS2024 PROCEEDINGS VOLUMES

Kaitlin Calva

THE WORLD COMES HERE.
TMS2024
153rd Annual Meeting & Exhibition

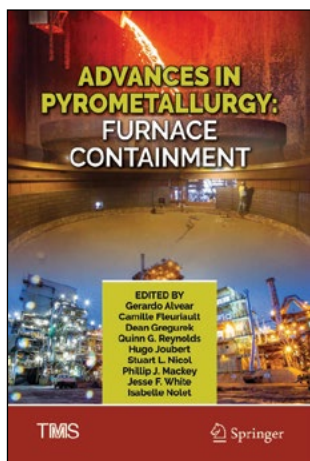


As a benefit of registering for the TMS 2024 Annual Meeting & Exhibition (TMS2024), scheduled for March 3-7, 2024, in Orlando, Florida, attendees will have free, online access to the meeting's proceedings publications. For those who are unable to register for TMS2024, the proceedings volumes and individual papers can be purchased through the TMS Bookstore portal at www.tms.org/Bookstore. All nine publications will be available by the start of the meeting.

TMS members receive a 40% discount on TMS proceedings and a 20% discount on TMS non-proceedings titles published with Springer. To receive the appropriate discount on the books described in this article, visit www.tms.org/Bookstore, log in to see the discount codes in the text above the product listing, and enter the proceedings discount code during checkout on the Springer website.

Read on to explore each of the TMS2024 titles.

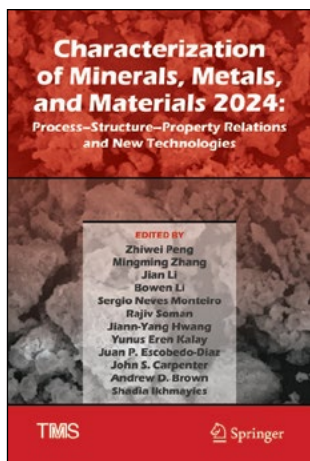
Advances in Pyrometallurgy: Furnace Containment



For the second year, the Pyrometallurgy Committee of TMS's Extraction & Processing Division (EPD) has sponsored the Advances in Pyrometallurgy symposium, focusing in 2024 on reactor design from the perspective of material containment. This collection explores the methods and challenges of containing corrosive and abrasive materials at extreme temperatures,

whether they are used across commodities or are technology specific. There is much to be learned from cross-commodity and cross-technology perspectives, and this collection creates a platform for the exchange of ideas on the challenges, solutions, failures, and successes in furnace containment designs, and applications while bringing together perspectives from industry, design houses, and research institutions. Topics include but are not limited to: advances in furnace lining design philosophies; advances in furnace design configurations and other design considerations; problems experienced and their solutions implemented during construction and commissioning; integration of new concepts into old smelters; back to basics: refractory materials, shells, and cooling systems; maintaining and monitoring; and process control and slag design.

Characterization of Minerals, Metals, and Materials 2024: Process–Structure–Property Relations and New Technologies



This collection focuses on the advancements of characterization of minerals, metals, and materials and the applications of characterization results on the processing of these materials. Advanced characterization methods, techniques, and new instruments are emphasized. Areas of interest include but are not limited to: extraction and processing of various

types of minerals; process–structure–property relationships of metals, glasses, ceramics, polymers, composites, etc.; novel methods and techniques for characterizing materials across a spectrum of systems and processes; characterization of mechanical, thermal, electrical, optical, dielectric, magnetic, physical, and other properties of materials; characterization of structural, morphological, and topographical natures of materials at micro- and nano-scales; characterization of extraction and processing including process development and analysis; advances in instrument developments for microstructure analysis and performance evaluation of materials; and 2D and 3D modeling for materials characterization.

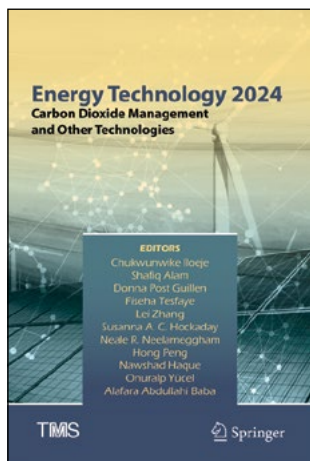
Composite Materials: Sustainable and Eco-Friendly Materials and Applications



This collection covers innovations in the field of composite materials with a specific focus on eco-friendly and environmentally sustainable systems. All composite fields are explored, including polymer, metal, and ceramic matrix composites with an emphasis on sourcing raw materials in a sustainable way as well as the development of

composite materials for environmental sustainability. Topics include the development of new component lifecycle along with discussions of novel methods to reuse existing materials. Additional topics include but are not limited to: naturally sourced materials feedstock; recycled materials feedstock; application of composite for reduced carbon footprint; and development of novel materials to repurpose waste from other areas.

Energy Technology 2024: Carbon Dioxide Management and Other Technologies



This collection focuses on industrial energy sustainability and carbon dioxide (CO₂) management, including processes that improve energy efficiency and reduce or eliminate industrial greenhouse gas (GHG) emissions. Topics address technology areas such as clean energy technologies, innovative beneficiation, smelting technologies, and process intensification, as well as

CO₂ capture and conversion for industrial applications. Areas of interest covered in this work include: decarbonizing materials processing; use of low carbon fuels, feedstock, and renewable energy resources for materials processing; emerging processes and techniques for industrial CO₂ capture and conversion/upgrade; CO₂ and other GHG reduction metallurgy in ferrous, nonferrous, and reactive metals processing, including rare-earth metals; energy efficiency and industrial electrification; electrification of industrial process heat and electrified production of energy carriers; energy efficiency improvements for materials processing and smart manufacturing for optimized process control; system integration and thermal integration of process heat, waste heat recovery, and other technologies for industrial energy efficiency; sustainability analysis; and techno-economics, life cycle assessment, resource efficiency, and circular economy modeling of energy-intensive processes and associated material supply chains.

light metal technologies. The 2024 collection includes contributions from the following symposia:

- Alumina & Bauxite
- Aluminum Alloys: Development and Manufacturing
- Aluminum Reduction Technology
- Electrode Technology for Aluminum Production
- Melt Processing, Casting, and Recycling
- Scandium Extraction and Use in Aluminum Alloys

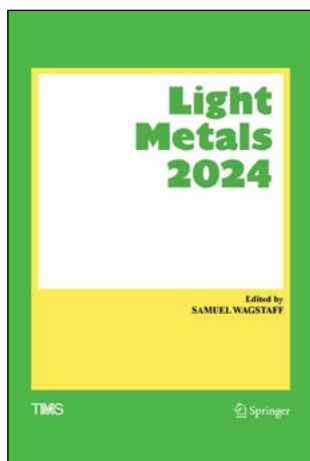
Magnesium Technology 2024



The Magnesium Technology Symposium at the TMS Annual Meeting & Exhibition is one of the largest yearly gatherings of magnesium specialists in the world. Papers represent all aspects of the field, ranging from primary production to applications and recycling. Moreover, papers explore everything from basic research findings to industrialization.

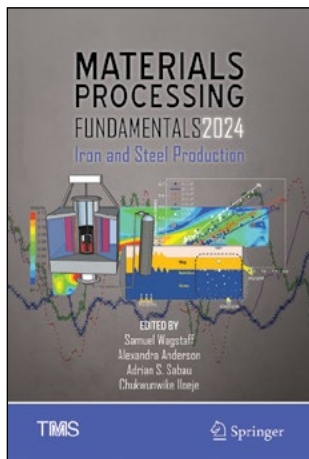
Magnesium Technology 2024 covers a broad spectrum of current topics, including novel extraction techniques; primary production; alloys and their production; integrated computational materials engineering; thermodynamics and kinetics; plasticity mechanisms; cast products and processing; wrought products and processing; forming, joining, and machining; corrosion and surface finishing; fatigue and fracture; dynamic response; structural applications; degradation and biomedical applications; emerging applications; additive manufacturing of powders; and recycling, ecological issues, and life cycle analysis.

Light Metals 2024



The Light Metals symposia at the TMS Annual Meeting & Exhibition present the most recent developments, discoveries, and practices in primary aluminum science and technology. The annual *Light Metals* volume has become the definitive reference in the field of aluminum production and related

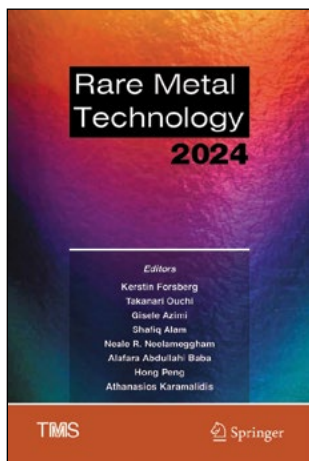
Materials Processing Fundamentals 2024: Iron and Steel Production



This collection covers various aspects of the fundamentals, synthesis, analysis, design, monitoring, and control of metals, materials, and metallurgical processes and phenomena. This volume focuses on the fundamentals of iron and steel production including ladle processing, casting, rolling, forging, and subsequent surface treatments. Topics represented include but

are not limited to: use of artificial intelligence or big data in the control or optimization of industrial processes; modeling or optimization of recycle streams and scrap loops; measurement and control in hostile environments; modeling transport phenomena in materials processing and metallurgical processes involving iron, steel, nonferrous metals, and composites; and thermodynamics, kinetics, and physical chemistry of materials processes and modeling thereof.

Rare Metal Technology 2024



This collection presents papers from the symposium Rare Metal Extraction & Processing, focused on the extraction of rare metals from primary and secondary materials and residues as well as rare extraction processing techniques used in metal production. The collection covers the extraction of less common or minor metals including elements such as antimony, bismuth,

barium, beryllium, boron, calcium, chromium, gallium, germanium, hafnium, indium, manganese, molybdenum, platinum group metals, rare earth metals, rhenium, scandium, selenium, sodium, strontium, tantalum, tellurium, and tungsten. It also includes rare metals of low-tonnage sales compared to high-tonnage metals (iron, copper, nickel, lead, tin, zinc, or light metals such as aluminum, magnesium, or

titanium and electronic metalloid silicon). Rare metal processing covers biometallurgy, hydrometallurgy, and electrometallurgy while novel high-temperature processes such as microwave heating, solar-thermal reaction synthesis, and cold crucible synthesis of rare metals are also addressed. Also included in this collection is the design of extraction equipment used in these processes from suppliers as well as laboratory and pilot plant studies.

TMS 2024 153rd Annual Meeting & Exhibition Supplemental Proceedings



This volume features contributions that represent 53 symposia from the meeting. This title is the latest in a collection of proceedings published each year in conjunction with the TMS Annual Meeting & Exhibition.

BROWSE THE TMS BOOKSTORE

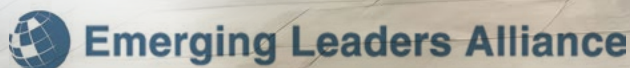
In addition to the TMS2024 proceedings presented in this article, TMS also offers convenient, searchable access to more than 300 past titles in its expanded online bookstore. To take advantage of this member benefit, go to www.tms.org/Bookstore and log in to access your 40% discount code on TMS proceedings publications offered by Springer.

Search by keyword, author, or year, with the option of purchasing individual papers as well as hardcopy and e-book formats.

Kaitlin Calva is an independent contractor providing writing support for TMS and JOM: The Magazine.

NOT YOUR AVERAGE TRAINING PROGRAM: TMS Members Go Above and Beyond at ELA Conference

Kaitlin Calva



Members of eight different science and engineering professional societies, including TMS, came together in Pittsburgh, Pennsylvania, in September 2023 to attend the fifteenth iteration of the Emerging Leaders Alliance conference.

"Attending the Emerging Leaders Alliance (ELA) conference was an enriching experience, and I would like to extend my heartfelt thanks to TMS for giving me this opportunity. It allowed me to connect with influential leaders, gain valuable insights, and enhance my leadership skills." **Soumya Varma**, KLA Corporation, shared after the 2023 ELA program. Held September 23–27 in Pittsburgh, Pennsylvania, for its fifteenth iteration, this interdisciplinary program is supported by the United Engineering Foundation and organized by eight partner societies, including TMS. Varma was one of seven TMS members to attend the 2023 conference. Registration costs for TMS attendees were funded by TMS and the TMS Foundation.

At its core, the ELA strives to provide high-quality training to equip early career individuals with the skills needed to guide the professions into the future. "In addition to technical competency," the ELA website notes, "today's engineering leaders need broad skills to meet the real problems facing mankind, including energy, sustainability, and health care." The ELA curriculum goes a step further than other programs by sharing executive-level knowledge and giving attendees the tools to identify and strengthen their own nontechnical skills.

Arun Mannodi Kanakkithodi, Purdue University, echoed Varma's sentiments. "We had the opportunity to interface with numerous experts in leadership, positive management, strategic thinking, and effective presentations, as well as with other early-career engineers, scientists, and academics."

Furthermore, participants shared their eagerness to apply what they learned in different ways. "The sessions were invaluable, covering everything from negotiating to conflict management. I am sure I will use the skills I learned both in my workplace and in my volunteer leadership roles," said **Victoria Miller**, University of Florida. "Attending the ELA was an unmatched opportunity to get to know some of the other early career leaders involved in TMS and other professional societies," she added.

This collaborative approach to leadership training allows attendees to experience a variety of science and engineering disciplines, broadening their opportunities to share challenges, solutions, and best practices among peers. Mannodi Kanakkithodi agreed with the other participants: "It was a fulfilling three days of energetic seminars and fun group activities, which helped us learn more about ourselves and ways to succeed in our careers. I especially enjoyed the talks on the art and science of negotiating and leveraging our social styles in solving problems."

If you are interested in honing your own scientific leadership skills, consider applying for the next ELA conference, scheduled for September 2024. Applicants must be TMS members, typically aged 24–40, with rising or current leadership positions within their organizations. To apply for a seat at the 2024 conference, please send a letter of interest, one or two letters of recommendation, and a resume or CV to Deborah Hixon, TMS Awards Program Manager, at hixon@tms.org. The deadline to apply is **May 15, 2024**. For additional information on the program, visit emergingleadersalliance.org.



TMS representatives at the 2023 Emerging Leaders Alliance conference were: Front row: **Brian Zukas**, senior engineer, Alcoa Corporation; **Yufeng Zheng**, associate professor, University of North Texas; **Deborah Hixon**, TMS Awards Program Manager; **Yu Zou**, assistant professor, University of Toronto; **Kara Luitjohan**, scientist, Los Alamos National Laboratory; Back row: **Victoria Miller**, assistant professor, University of Florida; **Arun Kumar Mannodi Kanakkithodi**, assistant professor, Purdue University; and **Soumya Varma**, field applications scientist, KLA Corporation.

Kaitlin Calva is an independent contractor providing writing support for JOM: The Magazine.

A STUDENT'S GUIDE TO TMS2024

Kelly Zappas

THE WORLD COMES HERE.
TMS2024
 153rd Annual Meeting & Exhibition



The TMS 2024 Annual Meeting & Exhibition (TMS2024) will provide an ideal venue for undergraduate and graduate students to explore different facets of the minerals, metals, and materials science and engineering professions. At this upcoming event, to be held March 3-7 at the Hyatt Regency Orlando in Orlando, Florida, students will learn from and interact with leaders in the field. They'll meet scholars from different schools—and even different countries—building relationships that stay with them throughout their careers. They'll practice presentation skills and gain experience talking with more senior members about their work.

But those who are new to the experience will also likely have a lot of questions about what to do and how to act at the conference. This article aims to answer some of the most frequently asked questions from students, as well as to provide tips for navigating the conference and a listing of student-specific events to add to your calendar.

Which Events are Open to Students?

As a student, you can attend any technical sessions that you choose. More than 4,000 technical presentations are planned over the course of four days. Students are welcome to attend any of these presentations and to ask questions of the presenters.

A list of events specifically targeted to students is included in the "Student Events at TMS2024" sidebar, but students are also welcome at many other social and networking events at TMS2024. You can enjoy appetizers at the Sunday night Welcome Reception, breakfast on Monday and Tuesday before the start of technical programming, and hors d'oeuvres at the exhibit hall receptions on Monday and Tuesday evening. You can browse displays in the exhibit hall. You can attend keynote sessions and watch the awards ceremony. Students are encouraged to explore and attend as many different kinds of events as possible.

Which Events Are *Not* Open to Students?

Not many. Committee membership and committee meetings are currently open only to professional members. However, starting in 2025, TMS will institute a new graduate student program that will allow students who are further along in their studies to participate on TMS technical committees and in groups like the TMS Emerging Professionals Committee for early-career scientists and engineers. More information will be available on this new program at TMS2024, but you can preview some of the plans for it in TMS Executive Director James J. Robinson's "In the Final Analysis" column in the February issue of *JOM: The Magazine*.

In addition, some special events (like the Diversity, Equity, and Inclusion Breakfast or honorary symposium dinners) require you to purchase tickets in advance to attend, but these events (which typically involve meals) will be labeled as ticketed and students are welcome to purchase tickets. Some ticketed events—like the technical division luncheons and the Emerging Professionals Tutorial Luncheon—require ticket purchases to receive a meal, but also provide seating for those who wish to listen to the lecture without purchasing food. The workshop and short course planned on Sunday afternoon are also open to students, but only if they register and pay the course fee in advance.

STUDENT EVENTS AT TMS2024

TMS2024 will feature the following events designed specifically for undergraduate and graduate students:

TMS Materials Bowl Competition and Networking Reception

Sunday, March 3 • 4:30 p.m. to 7:00 p.m.

Join us to participate in—or just watch—the 2024 TMS Materials Bowl knowledge and trivia competition and enjoy an informal networking reception for students, faculty advisors, recruiters, and Materials Bowl spectators. Light food and beverages will be provided. No tickets or reservations are required.

Technical Divisions Student Poster Showing and Judging

Monday, March 4 • 5:00 p.m. to 6:30 p.m.

Come and view your fellow students' posters, talk with them about their work, and congratulate the winners at this interactive poster showing and judging session. This event takes place in the TMS2024 Exhibit Hall during the Exhibit Opening Reception and Poster Contest I, meaning that you can also enjoy appetizers, beverages, and networking with other attendees at this event.

TMS Emerging Professionals Tutorial Luncheon & Lecture

Tuesday, March 5 • 12:45 p.m. to 2:45 p.m.

This event is designed for early-career professionals, but students are also welcome to come and hear talks from **Diletta Giuntini**, Eindhoven University of Technology, and **Atieh Moridi**, Cornell University. Tickets are \$75 and can be purchased through the TMS2024 registration form through February 16 if you would like to receive a lunch, but students are welcome to attend the lecture—without lunch—at no cost.

TMS Launch Your Career Workshop, sponsored by the TMS Emerging Professionals Committee

Tuesday, March 5 • 4:00 p.m. to 6:00 p.m.

- **Part I: Career Kickstart:** Attention soon-to-be graduates and postdocs stepping into the job market! Supercharge your career launch in this interactive workshop. Do you need help mastering job search skills like crafting killer resumes, finding the right listings, and sending out thank-you notes? Then this session is tailored for you. Get vivid examples and live feedback, join dynamic discussions, and leave armed with the tools to conquer the professional world.
- **Part II: Career Odyssey:** Unsure about your future path? Have more questions after attending Part I? Join our expert panelists for a turbocharged exploration of your first two years as a professional. Academia, industry, national labs, policy—our diverse panelists will spill the beans on their journeys. It is sure to be a fast-paced, enlightening discussion to guide your path and fuel your success. Don't miss out on this career compass!

2024 Bladesmithing Competition Awards Presentation

Tuesday, March 5 • 5:00 p.m. to 5:30 p.m.

A collection of blades created by student teams using hand hammering or trip hammer forging will be on display in the TMS2024 Exhibit Hall, Monday through Wednesday. Browse the displays and learn how the blades were created in this popular display. Then plan to join us on Tuesday for the awards presentation.

How Many Days Should I Spend at the Conference?

Ideally, all attendees should stay for the duration of the meeting, Sunday through Thursday, for maximum access to programming and events. Students are strongly encouraged to arrive in time to attend Sunday afternoon and evening events, like the TMS Materials Bowl Competition and Networking Reception and the all-conference Welcome Reception, and to stay at least through Tuesday evening, when student-specific events conclude.

How Many Students Typically Attend a TMS Annual Meeting?

Nearly 4,500 total attendees participated in the TMS 2023 Annual Meeting & Exhibition in San Diego, California. Of those, approximately 1,400 were students. Strong student turnout is expected once again in Orlando—particularly with the inclusion of the 2024 TMS Bladesmithing Competition at this year's meeting—giving you plenty of opportunities to interact with your peers.

See You for TMS2024 in Orlando!

It's not too late to join your peers at TMS2024 in Orlando. You can register now at www.tms.org/TMS2024. There are discounted registration rates for both undergraduate and graduate students, so be sure to select the appropriate rate.

Through the website, you can also access scheduling tools, preview programming plans, learn more about student events, and make housing reservations. We look forward to seeing you at TMS2024!

TIPS FOR NAVIGATING THE CONFERENCE

Read Your Email

The week before the conference, you'll receive an email from TMS that includes valuable instructions for the week—with information on everything from how to download conference proceedings (included with your registration fee) to where to pick up your badge.

Download the App

You'll be notified when the TMS2024 app is ready to download (sometime in February). When it is, be sure to download it right away. This will act as your handheld guide to the meeting.

Make a Schedule

There are literally *thousands* of papers being presented at TMS2024. We recommend using the app to locate sessions and topics that interest you and to build a personalized schedule for the week.

Attend General Interest Lectures

Be sure to make time for the TMS2024 Plenary Session on Tuesday afternoon, where panelists will talk about critical materials issues. Luncheon lecturers and keynote sessions are also good places to find more general-interest talks aimed at a broader audience and to provide you with insight into the different kinds of conversations happening throughout the materials science and engineering communities.

Wear Comfortable Shoes

The TMS programming department strives to group similar programming topics together to make it easy to hop from one session room to another, but it's still a big meeting with events happening throughout the resort. If your interests are wide-ranging, you'll be walking a lot.

Apply for Chapter Travel Grants

Student chapters can apply for reimbursement (up to \$500 per chapter) after the meeting to help offset travel expenses. Learn how through the Travel Grants section at www.tms.org/Students.

CONGRATULATIONS TO THE 2024 CLASS OF TMS SCHOLARS

JILLIAN SCHULTZ

The 2024 class of TMS Scholars reflects the bright future of the minerals, metals, and materials professions. Through the generous support of the TMS Foundation, these scholarship recipients can build a stronger platform for their future. In addition to helping with the cost of education, many of the scholarships awarded include travel grants to aid students in attending highly regarded professional meetings, like the TMS Annual Meeting & Exhibition. This allows these students to begin networking with professionals in their field, to expand their technical knowledge, and to build their professional profile.

Many of the scholarships listed below will be awarded during the TMS 2024 Annual Meeting & Exhibition (TMS2024) technical division functions, portions of which are open to all TMS2024 attendees. Other awards and scholarships will be conferred at the TMS-AIME Awards Ceremony, jointly presented by TMS and the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME), during TMS2024. All TMS2024 participants are invited to attend as part of their registration.

TMS2024 will be held from March 3–7, 2024, in Orlando, Florida, USA. Learn more about what you can expect at the meeting and register today at www.tms.org/TMS2024.



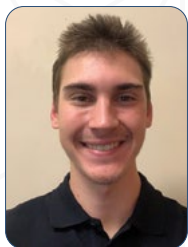
TMS DIVISION AWARDS

TMS Division Scholarship Recipients will also receive a dollar-for-dollar scholarship match through the Battelle Matching Scholarship Program. This is made possible through the generous support of Battelle and its retired chief executive officer, Jeffrey Wadsworth.

Additionally, students who receive a Battelle Matching Scholarship will be eligible for a Battelle Materials Graduate Student Award when they matriculate to a graduate school to continue studies in a materials-related field.

Extraction & Processing Division (EPD) Scholarship

Awarded through the EPD and the TMS Foundation to sophomore or junior undergraduate students majoring in the extracting and processing of minerals, metals, and materials.



Josh Black
McMaster University

"TMS and Material Advantage have allowed me to learn about the materials industry outside of class and have given me an increased understanding of how materials and material science are used in

today's society. Through the knowledge TMS has given me, I hope to become a positive impact on the materials science and engineering community. Post graduation, I hope to become an active member within the industry, with knowledge on computational materials and how AI can be used within the materials engineering field."

Functional Materials Division (FMD) Gilbert Chin Scholarship

Awarded through the FMD and the TMS Foundation to sophomore or junior undergraduate students studying subjects related to synthesis and processing, structure, properties, and performance of electronic, photonic, magnetic, and superconducting materials, as well as materials used in packaging and interconnecting such materials in device structures.



Anush Singhal
Georgia Institute of Technology

"From connecting with professors who are a part of the TMS community in Canada recommending this field of study to networking, social, and professional events hosted at the Georgia

Institute of Technology by our Material Advantage

chapter, TMS has provided me with a community of members to connect to. These experiences have led me to apply to graduate school with hopes of obtaining a Ph.D. in materials science with a focus on sustainable materials research in electronics. I am honored to receive the FMD Gilbert Chin Scholarship and would like to thank the TMS Foundation and Battelle and Jeffrey Wadsworth for their continued support in my education, providing me with new experiences, and investing in my future."

Materials Processing & Manufacturing Division (MPMD) Scholarship

Awarded through the MPMD and the TMS Foundation to sophomore or junior undergraduate students majoring in metallurgical and/or materials science and engineering, with an emphasis on manufacturing, integrating process control technology into manufacturing, and basic and applied research into key materials technologies that impact manufacturing processes.



Mary England
McMaster University

"Becoming a recipient of a TMS Materials Processing & Manufacturing Division Scholarship is an incredible honor, supporting and advancing my knowledge and excellence within this dynamic and

expanding field of materials engineering. Because of the generous support from TMS, Jeffrey Wadsworth and Battelle, I will be able to focus on my studies to successfully graduate with a Biomedical and Materials Engineering degree and become a world innovator and leader in materials research and technological advancement. Being recognized by the TMS Foundation has inspired me to continue onward and upward with my studies and career goal of becoming a Materials Engineer and leader on the global stage."

Apply for a 2025 TMS Scholarship

If you are a full-time undergraduate or graduate student interested in financial assistance, early career recognition, and important opportunities for advancement through technical exchanges at the TMS Annual Meeting & Exhibition, consider applying for a 2025 TMS Scholarship.

The deadline to apply for a 2025 award is March 15, 2024. Applicants must use the official online form to submit their application and supporting documents before this deadline. Visit www.tms.org/Awards to learn more about applying.

Structural Materials Division (SMD) Scholarship

Awarded through the SMD and the TMS Foundation to sophomore or junior undergraduate students majoring in metallurgical and/or materials science and engineering with an emphasis on the science and engineering of load-bearing materials, including studies into the nature of a material's physical properties based upon its microstructure and operating environment.



Conway Zheng
Drexel University

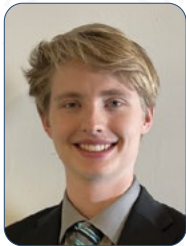
"I am extremely thankful and honored to be selected for the 2024 Structural Materials Division Scholarship and its financial support for my continued studies in the materials field. This scholarship

will not only help me to be closer to my university but also toward future projects, internships, and jobs. Being involved with TMS and Material Advantage has provided me with numerous opportunities and support through connections with peers and faculty, professional development workshops, and now experiences outside my city—an invitation to the TMS Annual Meeting!"

ACTA MATERIALIA AWARDS

Acta Materialia Undergraduate Scholarship

Supported by the generosity of Acta Materialia Inc. and issued under the TMS Foundation, this scholarship is available to undergraduate students majoring in metallurgical engineering, materials science and engineering, or to undergraduate students with a significant interest in the materials area.



Soren Hellyer
Iowa State University

"It is an honor to receive the Acta Materialia scholarship. As a member of TMS and Material Advantage, I have made many meaningful connections, especially with my classmates and staff. I am incredibly

grateful to Acta Materialia Inc., TMS, and the TMS Foundation for the recognition as this scholarship not only supports my undergraduate degree but will also help me attend future conferences to continue making valuable connections. When I graduate, I plan on pursuing a Ph.D. either studying metals for application in high energy physics or semiconductors."



Matthew Sherman
Missouri University of Science and Technology

"Receiving the Acta Materialia Scholarship is an incredible honor, and I am deeply grateful to TMS, Material Advantage, and Acta Materialia Inc. for providing me with this amazing opportunity. TMS and Material Advantage have offered an exceptional platform for networking that has allowed me to cultivate invaluable connections with peers, mentors, and experts who have been instrumental in my professional development by offering guidance, knowledge, and collaborative opportunities that have significantly enhanced my comprehension of materials science and its practical applications. Following the completion of my undergraduate degree in metallurgical engineering, my plan is to advance into a master's program and then pursue a career in the manufacturing industry."

AIME AWARDS

AIME Henry deWitt Smith Scholarships

This scholarship is awarded to graduate students majoring in mineral, metal, and/or materials engineering. The award aims to advance the mineral industries by assisting students in the pursuit of graduate education in mining, metallurgical, materials, or petroleum-related disciplines.



Sylvie Crowell
Case Western Reserve University

"Receiving the Acta Materialia Scholarship is an incredible honor, and I am deeply grateful to TMS, Material Advantage, and Acta Materialia Inc. for providing me with this amazing opportunity. TMS and Material Advantage have offered an exceptional platform for networking that has allowed me to cultivate invaluable connections with peers, mentors, and experts who have been instrumental in my professional development by offering guidance, knowledge, and collaborative opportunities that have significantly enhanced my comprehension of materials science and its practical applications. Following the completion of my undergraduate degree in metallurgical engineering, my plan is to advance into a master's program and then pursue a career in the manufacturing industry."



Pierangeli Rodriguez De Vecchis
University of Pittsburgh

"I am incredibly grateful to TMS for this award and for their continued support to student growth in the materials field. Since the beginning of my undergraduate journey in materials science, Material

Advantage encouraged me to expand my interests and connections through conferences, events, and inspiring talks. Now, this award is an affirmation of my efforts, as well as an encouragement to continue working hard for high quality materials research. I hope to one day repay this honor to TMS and my mentors through continued curiosity and dedication to materials research and education."

TMS International Symposium on Superalloys Scholarships

This award is for undergraduate and graduate students majoring in metallurgical and/or materials science and engineering with an emphasis on all aspects of the high-temperature, high-performance materials used in the gas turbine industry and all other applications. Awards are presented in conjunction with the Materials Science and Technology Conference and the International Symposium on Superalloys.

Semanti Mukhopadhyay
Ohio State University

"It is with great honor and gratitude that I accept the TMS International Symposium on Superalloys Scholarship. This recognition emphasizes the importance of advancing both fundamental and application-oriented research on superalloys. This award not only supports my academic journey but also affirms my dedication to innovative material design, processing, and multi-scale characterization."



Cynthia Rodenkirchen
Imperial College of London

"I am incredibly thankful to have been awarded this scholarship as a recognition of my efforts to advance research on Ni-based superalloy compositions for aero-engine applications. TMS has significantly

benefited my work and professional development during my attendance at the TMS 2023 Annual Meeting & Exhibition, where I was able to present my research and connect with other researchers working in similar areas. After finishing my PhD, I wish to continue my career in academia by pursuing a postdoc on oxidation of Ni-based superalloys."

Kaufman CALPHAD Scholarship

This scholarship is awarded to an undergraduate student majoring in metallurgical engineering, materials science and engineering, or minerals processing/extraction programs. The scholarship is established to recognize the memory of Dr. Larry Kaufman for his contributions to computational thermodynamics and its applications. It is supported by CALPHAD Inc. and the TMS Foundation.



Jakob Scroggins
University of Tennessee, Knoxville

"I am incredibly grateful for the generosity of TMS and its supporters and donors! In addition to financial assistance, TMS and Material Advantage have helped me develop as a leader and

student through professional, social, and service-related events. After graduation, I plan to pursue graduate studies of materials for energy storage and sustainability."



Your Donation. Their Future.

The scholarships highlighted in this article allow the next generation of the materials community to pursue a brighter future, enabling more doors to open and careers to be built. Students are facing extraordinary challenges to their career paths, making support provided by these scholarships more impactful than ever before.

The awards featured in this article are made possible by the TMS Foundation and its generous supporters. You can ensure that the good work of the Foundation continues by donating today at www.TMSFoundation.org/Contribute. For more information or to discuss donation options, contact TMS Foundation staff at TMSFoundation@tms.org.

TMS MEETING HEADLINES

Meeting information is current as of December 1, 2023. For the most recent updates on TMS-sponsored events, visit www.tms.org/Meetings.

TMS 2024 Annual Meeting & Exhibition (TMS2024)



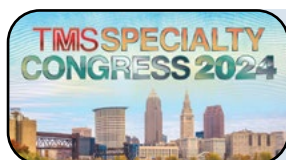
March 3–7, 2024
Orlando, Florida,
USA

Register Now

Come together with more than 4,000 of your colleagues from the global minerals, metals, and materials community, all under one roof at the Hyatt Regency Orlando. This year's all-conference plenary features a special panel discussion on critical materials.

www.tms.org/TMS2024

TMS Specialty Congress 2024



June 16–20, 2024
Cleveland, Ohio,
USA

Discount Registration Deadline: April 30, 2024

AIM 2024 will focus on integrating artificial intelligence into materials science research and manufacturing processes. It will address key issues and identify future pathways in AI implementation in materials science and engineering and related manufacturing processes.

www.tms.org/SpecialtyCongress2024

15th International Symposium on Superalloys (Superalloys 2024)



September 8–12, 2024
Champion, Pennsylvania,
USA

Discount Registration Deadline: July 31, 2024

Superalloys 2024 will be located at the Seven Springs Mountain Resort. In addition to saving you time and money, staying at the conference location will give you convenient access to technical session rooms and social functions, allowing plenty of informal networking opportunities with your colleagues.

www.tms.org/Superalloys2024

OTHER MEETINGS OF NOTE



TMS 2025 Annual Meeting & Exhibition (TMS2025)

March 23–27, 2025
Las Vegas, Nevada, USA

www.tms.org/TMS2025



TMS Specialty Congress 2025

June 15–19, 2025
Anaheim, California, USA

www.tms.org/SpecialtyCongress2025



Extraction 2025 Meeting & Exhibition (Extraction 2025)

November 16–20, 2025
Phoenix, Arizona, USA

www.extractionmeeting.org/Extraction2025



TMS 2026 Annual Meeting & Exhibition (TMS2026)

March 15–19, 2026
San Diego, California, USA

www.tms.org/AnnualMeeting

CO-SPONSORED MEETINGS

OTC Asia 2024

February 27–March 1, 2024
Kuala Lumpur, Malaysia

Co-sponsored by TMS

Offshore Technology Conference 2024

May 6–9, 2024
Houston, Texas, USA

Co-sponsored by TMS

4th International Symposium on Electrometallurgy - part of the 63rd Conference of Metallurgists (COM 2024)

August 19–22, 2024
Halifax, Nova Scotia, Canada

Co-organized by TMS

HONORS FOR EVERY CAREER STAGE

Explore the many TMS awards available for established professionals, early career professionals, and students.



Most TMS awards have a nomination or application deadline of April 1.



View the individual award pages for more details at www.tms.org/awards

CALL FOR ABSTRACTS

Abstracts Due May 1, 2024

TMS FALL 2024

@ MATERIALS SCIENCE & TECHNOLOGY

October 6-9, 2024 | Pittsburgh, Pennsylvania | #TMSFallMeeting

Join your TMS colleagues for the TMS Fall Meeting 2024 at Materials Science & Technology (TMS Fall 2024) in October.

Submit your work to one of 37 TMS-sponsored symposia planned in the following subject areas:

- Additive Manufacturing
- Artificial Intelligence
- Biomaterials
- Fundamentals and Characterization
- Iron and Steel (Ferrous Alloys)
- Lightweight Alloys
- Materials-Environment Interactions
- Modeling
- Nanomaterials
- Nuclear Energy
- Sustainability, Energy, and the Environment



SUBMIT YOUR WORK TODAY!

Scan the QR code or visit:

www.tms.org/TMSFall2024