

# JOM THE MAGAZINE

MARCH 2024

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## ABOUT THE COVER



It's our anniversary, and we're celebrating 75 years of *JOM* by looking back at how the publication has progressed through the years, from the first *Journal of Metals* issues published in 1949 to the *JOM* we know today. Take a closer look at some of the major milestones in our history in the feature article "A Gem of a Journal: Celebrating *JOM*'s Diamond Jubilee" starting on page 21. This month's cover was designed by David Rasel, TMS Senior Manager, Brand and Digital Assets.



### Access Technical Journal Articles

TMS members receive free electronic access to the full library of TMS journals, including *JOM*. Technical articles published in *JOM: The Journal* are available on the Springer website. TMS members should log in at [www.tms.org/Journals](http://www.tms.org/Journals) to ensure free access.

### About JOM: The Magazine:

This print publication is excerpted from the publication of record, *JOM*, which includes both The Magazine and The Journal sections. *JOM: The Magazine* includes news and insights about TMS, its members, and the professions it serves. To access the publication of record, visit [www.tms.org/JOM](http://www.tms.org/JOM).

### About TMS:

The Minerals, Metals & Materials Society (TMS) is a professional organization that encompasses the entire range of materials science and engineering, from minerals processing and primary metals production to basic research and the advanced applications of materials. Learn more at [www.tms.org](http://www.tms.org).

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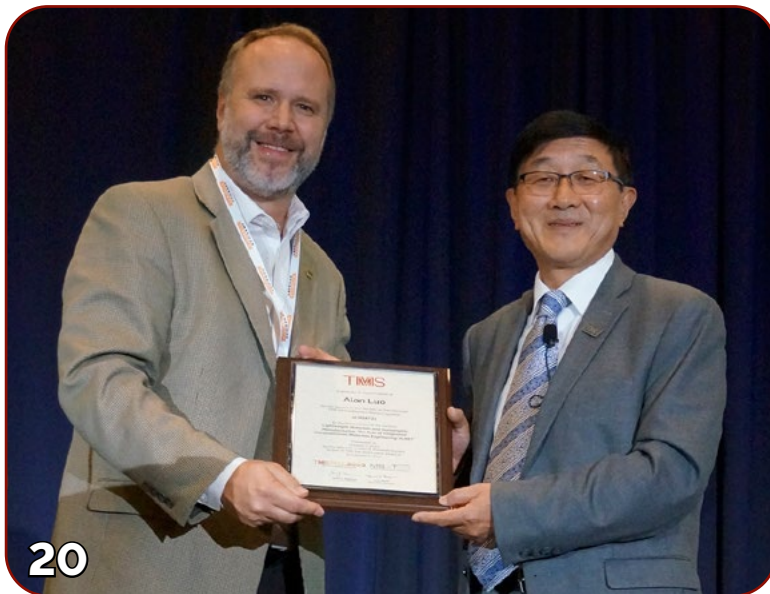
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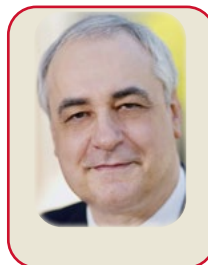
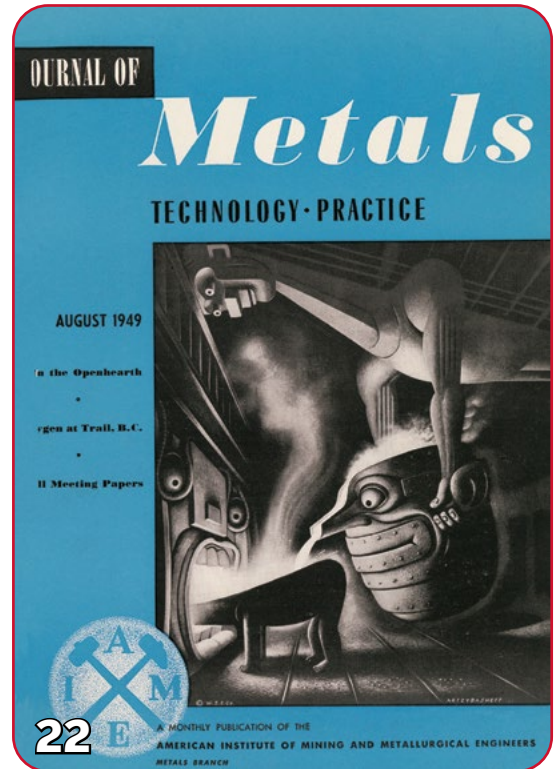
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# IN THE FINAL ANALYSIS

*"As all entrepreneurs know, you live and die by your ability to prioritize. You must focus on the most important, mission-critical tasks each day and night, and then share, delegate, delay or skip the rest."*

—Jessica Jackley

When discussing entrepreneurial behavior, TED-talker Jessica Jackley knows from whence she speaks. She's cofounded many altruistic organizations and has specialized in creating opportunities globally for those who generally find opportunities elusive. Living and dying by prioritization: It is a philosophy that has become essential to TMS as our leaders have worked hard over the last year to mindfully calibrate our aspirations with our capabilities.

Historically, TMS has pursued numerous initiatives with a vigor that led us to realize many meaningful outcomes. In short: We have ingenuity, enthusiasm, and resources, so let's do it! One of the painful learnings of the pandemic era, however, is that seemingly plentiful resources can evaporate quickly when revenue streams are disrupted. Post-pandemic, we find it necessary to be more deliberative even as our ideas keep coming. Recognizing the need to prioritize, the Board of Directors adopted at TMS2023 a process for ranking our inventory of initiatives so that mission-critical projects were slotted to the top while promising—but less critical—initiatives were positioned into secondary or tertiary slots.

Over the course of 2023, that prioritization led to six projects being focused upon most intently. They are as follows (in no particular order):

- Develop the third annual meeting of the Society in the form of TMS Specialty Congress and bundle within the Congress specialty meetings that would otherwise be small standalone events. . . . *Status: The first Specialty Congress will be held in June 2024 with future iterations contracted for 2025 and 2026.*
- Grow the exhibition footprint within the TMS Annual Meeting & Exhibition to the satisfaction of exhibitors and attendees alike. . . . *Status: Considerable behind-the-scenes work underway with an eye toward early impacts at TMS2024.*
- Develop a structured mentorship program focused on including new voices in volunteer and leadership roles. . . . *Status: The program should launch after TMS2024.*
- Revamp the "TMS 101" session. Make recurrent at TMS meetings an update of the session held at TMS2018, which was a successful communication mechanism to introduce new members to TMS and outline paths for volunteerism. . . . Incorporate "TMS civics" on how to participate most effectively on TMS committees and divisions and better understand ascension pathways. . . . *Status: Elements of this revamped program launch at TMS2024.*
- Develop the plan to increase diversity, equity, and inclusion in TMS Honors and Professional Recognition. . . . *Status: This issue is receiving attention via the ad hoc Awards Committee, with recommendations to be submitted at TMS2024.*
- Implement the recommendations of the TMS Foundation Business Plan assessment toward the creation of a 2025–2027 Foundation Business Plan. . . . *Status: The Board of Directors and Foundation Board of Trustees will hold a retreat on this topic during TMS2024.*

With these top priorities nearing completion, is the Society out of initiatives? Not a chance. Our prioritization list has 33 additional projects ready to cycle into the spotlight when the above are completed. More are always in development, which requires us to maintain the discipline of being deliberate, patient, and realistic. Or, as Jessica Jackley puts it, focus "on the most important, mission-critical tasks each day and night, and then share, delegate, delay or skip the rest." TMS is committed to doing just that.



James J. Robinson  
Executive Director



James Robinson

*"The Board of Directors adopted at TMS2023 a process for ranking our inventory of initiatives so that mission-critical projects were slotted to the top while promising—but less critical—initiatives were positioned into secondary or tertiary slots."*



# JOM TECHNICAL TOPICS

Find peer-reviewed technical articles covering the full range of minerals, metals, and materials science and engineering in the March issue of *JOM: The Journal*. Each issue features several technical topics presenting a series of related articles compiled by guest editors. A preview of March technical topics and articles are listed below. TMS members can log in to [www.tms.org/Journals](http://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 March issue, based on information available at press time. For the most up-to-date article listing, visit [www.tms.org/JOM](http://www.tms.org/JOM).

## MARCH 2024

### Electrical Steels

**Editors:** Youliang He, Natural Resources Canada; and Leo Kestens, Ghent University

**Sponsor:** Steels Committee

"The Early Stage Formation of Shear Orientations and the Stability of <001>//ND Orientations During Hot Rolling in Electrical Steels," **Huanzhu Wang**, et al.

"Microstructure, Particle Size, and Magnetic Property of Fe-6.5wt.% Si Nanocrystalline Alloys Prepared by Mechanical Alloying," **Yang Sun**, et al.

"Effect of Annealing Temperature and Time on the Magnetic Properties and Magnetic Anisotropy of a Temper-rolled, Semi-processed Non-oriented Electrical Steel," **Youliang He**, et al.

"The Addition of Boron to Melt-Spun Fe-6.5%Si Ribbons," **Gaoyuan Ouyang**, et al.

"Grain Structure Evolution in Fe-6Si During Directed Energy Deposition," **A. Plotkowski**, et al.

"Evolutions of Microstructure and Crystallographic Texture in an Fe-1.2 wt.% Si Alloy After (A)symmetric Warm Rolling and Annealing," **Tuan Nguyen-Minh**, et al.

"Some Aspects of Magnetic Anisotropy in Non-Grain-Oriented (NGO) Electrical Steels," **Bevis Hutchinson**, et al.

"The Impact of Temperature on the Electric, Magnetic and Thermal Properties in the Selection of Ferromagnetic Materials for Traction Machines," **Sigrid Jacobs**, et al.

### Mechanistic Interactions in Energy Storage

**Editors:** Partha Mukherjee, Purdue University; Pallab Barai, Argonne National Laboratory; Dibakar Datta, New Jersey Institute of Technology; and George Nelson, University of Alabama in Huntsville

**Sponsor:** Energy Conversion and Storage Committee

"Preparation of Fe<sub>2</sub>O<sub>3</sub>/Mn<sub>3</sub>O<sub>4</sub>/C Composites as High Performances Anode Materials for Lithium-Ion Batteries," **Xiaoyan Zhang**

"Phase Field Modeling of Pressure Induced Densification in Solid Electrolytes," **Pallab Barai**, et al.

"On the Impact of Mechanics on Electrochemistry of Lithium-Ion Battery Anodes," **Ankit Verma**, et al.

"Probing Asymmetric Plating and Stripping Behavior of Symmetric Sodium Metal Batteries," **Susmita Sarkar**, et al.

"Mechanical and Li Diffusion Properties of Interface Systems in the Solid Electrolyte Interphase," **Yunxiang Wang**, et al.

"Galvanic Replacement of Magnesium Nanowire Arrays to form Templated Antimony Frameworks," **Luis Carrillo**, et al.

"Advances in Inorganic Solid Electrolytes: A Mini Review," **Yi-An Wang**

"Electro-Chemo-Mechanical Modeling of Multiscale Active Materials for Next-Generation Energy Storage: Opportunities and Challenges," **Dibakar Datta**

"The Linkage Between Electro-Chemical and Mechanical Instabilities in Battery Materials," **Minal Wable**, et al.

"Can We Intuitively Tune Electrochemical Reactions by Changing Electrolyte Species?" **Aashutosh Mistry**

"Unleashing the Potential of NASICON Materials for Solid-State Batteries," **Anand Parejiya**, et al.



## Powder-based Functional Materials for Extreme Environments: Processing and Characterization

**Editors:** David Yan, San Jose State University; and Tim Prost, Uniformity Labs, Inc.

**Sponsor:** Powder Materials Committee

"Production of AA 2014 Matrix Wollastonite/Wood Ash Solid Waste Particle Reinforced Hybrid Composite with Powder Metallurgy and Investigation of Its Structural Properties," **Hakan Gökmeşe**, et al.

"Development of Heat-Resistant Composites Based on Al-Mg-Si Alloy Mechanically Alloyed with Aluminide Particles," **A. S. Prosviryakov**, et al.

"Process Parameter Optimization and Improved Properties of Large Electric Current Sintered Mo-W-Cu Alloys Using Orthogonal Analysis," **Hongling Zhou**, et al.

"Preparation of Spherical Porous and Spherical Ti6Al4V Powder by Copper-Assisted Spheroidization Method," **Jin Qian**, et al.

"Thermal Conductivity and Microstructure of Cu-Coated Graphite Flake/Ti Alloy Composites Fabricated by Spark Plasma Sintering," **Zunyue Yu**, et al.

"Experimental Optimization of Blended Powder Semisolid Forming Parameters for Production of 316L Stainless Steel Nanocomposites Reinforced with  $Al_2O_{3np}$ ," **Akbar Javdani**, et al.

"Study on the Permeability and Mechanical Properties of Copper Powder/Mesh Porous Plates," **Yingmao Chen**, et al.

"Evaluation of High-Vacuum Annealing and Hot Isostatic Pressing on the Microstructure and Properties of an Additively Manufactured Niobium Alloy," **Carter Fietek**, et al.

"A Tutorial Review on Composites of Silica and Smart Microgels," **Muhammad Arif**

## Recent Developments on Metals and Energy Extraction from Waste Streams

**Editors:** Fiseha Tesfaye, Åbo Akademi University, Metso Outotec Metals Oy;

Joseph Hamuyuni, Metso Outotec Research Center; **Chukwunwike Iloeje**, Argonne National Laboratory;

Leiting Shen, Central South University; and **Dirk Verhulst**

**Sponsor:** Energy Committee and Recycling and Environmental Technologies Committee

"Thermal Analysis and Phase Equilibria of the Molten System  $Na_3AlF_6$ - $NdF_3$ - $Nd_2O_3$ ," **Dhiya Krishnan**, et al.

"Influence Mechanism of Phase Change on Leaching of Metal Elements from Ternary Lithium Ion-Battery Waste in Citric Acid," **Xiaoyu Wu**, et al.

"Recovered Scandium from Tungsten Residue with High Silicon Content," **Jinxi Qiao**, et al.

"Recovery of Tellurium from Cyanide Leaching Gold Tailings and the Leaching Mechanism of Lead Telluride," **Wei Yang**, et al.

"A Case Study of Producing Alumina from High-Sulfur Diasporic Bauxite: Sulfur-Containing Desilication Products and Pyrite in Red Mud," **Saikui Wang**, et al.

"Study on the Effect of Thermal Activation on Arsenic Removal from Industrial Wastewater," **Bo Yu**, et al.

"Vanadium Recovery from Bayer Process Liquor Residue," **Massimiliana Pietrantonio**, et al.

"Dimensional Variation and Parametrical Feasibility for Utilizing Aluminum Cast-House Flue Gases to Supplement Heat for the Organic Rankine Cycle (ORC)," **Nan Zou**, et al.

"Construction of Valuable Element Allocation Model of Cobalt-rich Slag in the Hydrometallurgy Process," **Qian Li**, et al.

"Thermodynamics of Separating Molybdenum(VI) Over Iron(III) from High Acid Leach Solutions with Mixtures of P507 and N235," **Miaomiao Peng**, et al.

"Optical and Dielectric Properties of Multiphase Phosphate Obtained from Phosphoric Acid Treatment of Bauxite Residue," **Kishore Kumar Mayuranathan**, et al.

"Recovery of Lithium from Beta-Spodumene Through Serial Calcination and Water Leaching with  $CaO$ ," **Dongseok Lee**, et al.

"Sodium Removal from Aluminum Electrolysis Spent Anodes (Butts) Through Aluminum Sulfate Hydrothermal Acid Leaching," **Chengcheng Xia**, et al.

"Mechanical Activation of Coal Fly Ash for the Improvement of Alumina-Silica Separation During Reduction Roasting-Alkaline Leaching Process," **Hongyang Wang**, et al.

"Effect of Iron Content on High Strength and Environmentally Friendly Water-Permeable Bricks Prepared From W-Mo Tailing and Iron Slags," **Hongrui Guan**, et al.



"Comprehensive Extraction of Silica and Alumina from Coal Fly Ash Via Reduced and Oxidized Roasting-Low Temperature Alkaline Leaching and Bayer Digestion," **Peng Wang**, et al.

"Recycling of Yttrium and Europium from Microwave-roasted Waste Cathode Ray Tube Phosphor Powder," **Rajiv Ranjan Srivastava**, et al.

"Recovery of Alumina and Alkali from Red Mud Using  $\text{NaFeO}_2$  (NF) as an Additive in the Hydrothermal Process," **Jun Shao**, et al.

"Study on the Extraction of Valuable Components from Aluminum Electrolysis Spent Carbon Anode by Mechanical Activation Assisted Flotation," **Liu He**, et al.

"Study on the Cavitation and Dissociation of Sulfur from Zinc Leaching Residue," **Weizhi Zeng**, et al.

"Characterization of Nickel in Chromite Beneficiation Tailings by Mineral Liberation Analysis and Its Recovery by  $\text{H}_2\text{SO}_4$  Leaching Followed by Oxalic Acid Precipitation," **Mahmut Altiner**, et al.

"Recycling Of Spent Catalysts from the Petrochemical Industry by Hydrometallurgy to Obtain High-Pure Nickel Products for Electroplating," **Nayara Gomes**, et al.

"Investigation into the Impact of  $\text{Fe}_2\text{O}_3$ ,  $\text{MgO}$ , and  $\text{Al}_2\text{O}_3$  Contents on the Ca Ions Leaching Rate of Steel Slag," **Yinbo Luo**, et al.

"Investigation of the Optimal Recovery of Sn, Pb, Cu, and Ni from E-waste Generated Type of Slags in the Black Copper Processing Route," **Niklas Jylhävuori**, et al.

"Physical Concentration of Heavy Minerals: A Brief Review on Magnetic Separation Process Techniques," **Nnaemeka Stanislaus Nzeh**, et al.

"Recycling NdFeB Magnets and Rare Earth Fluorescent Materials from Electronic Waste," **Qiande Xu**, et al.

## The Role of Microstructure on the Mechanical Behavior of Materials

**Editors:** **Cyril Williams**, DEVCOM Army Research Laboratory; and **Kris Darling**, DEVCOM Army Research Laboratory

"A Review of the Anomalous Dynamic Behavior in Magnesium Alloys," **Kiran Solanki**, et al.

"Microstructural Analysis of the Improved Strength-Ductility Combination in Titanium Alloy with Bi-modal Structure," **Wenguang Zhu**, et al.

"Age-Hardening Behavior and Phase Transformation of Mg-9.2Gd-1.9Y-1.8Zn-0.5Zr Alloy," **Yunfang Liu**, et al.

"Relationship Between Powder Size, Prior Particle Boundaries and Properties of FGH4096M Nickel-Based Superalloy," **Xiaona Ren**, et al.

"Role of Crystal Orientation in the Dynamic Strength of Magnesium Alloy AZ31B," **J. C. Jonsson**, et al.

"Microstructural Characterization and Nanomechanical Properties of Multilayer Graphene on Metal Substrates," **Salil Bavdekar**, et al.

"The Role of Target Melting in Particle Impact Ignition with Inert Particulate," **Spencer V. Taylor**, et al.

## ANNUAL MEETING OF THE MEMBERSHIP ANNOUNCEMENT

The Minerals, Metals & Materials Society, Inc. (TMS), in accordance with its bylaws (Article II, Section 2.6, and Article III, Section 3.7) will hold its 2024 Annual Meeting of the Membership with Open Board of Directors Meeting, on Thursday, March 7, 2024, at 8:00 a.m. at the Hyatt Regency Orlando, during the TMS 2024 Annual Meeting & Exhibition in Orlando, Florida.



THE WORLD COMES HERE.  
**TMS 2024**  
153<sup>rd</sup> Annual Meeting & Exhibition

# RECOGNIZING THE 2024 TMS SOCIETY AWARD RECIPIENTS

Jillian Schultz



**TMS**  
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METALLURGICAL, AND PETROLEUM ENGINEERS

**TMS**  
FOUNDATION

The TMS award recipients represent the most accomplished members of the minerals, metals, and materials community. These honors reach every career level by recognizing young professionals, outstanding lifetime contributions, and everything in between. Award winners are honored with well-deserved recognition, and this recognition aids in the advancement of the entire community, providing opportunities for career growth, encouraging methods to share knowledge, and inspiring others to strive for new heights.

This article highlights the Society-level awards which will be conferred during the TMS–AIME Awards Ceremony at the TMS 2024 Annual Meeting & Exhibition (TMS2024) in Orlando, Florida, USA, from March 3–7, 2024. Awards will be presented by TMS, the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME), and Acta Materialia, Inc. Visit [awards.tms.org](https://awards.tms.org) to learn more about each of the awards listed in this article and their current and past recipients.

## 2025 TMS AWARDS NOMINATIONS DUE APRIL 1

Do you have a colleague who has made a significant impact on their field? Have they been of great service to their community or to TMS? Honor their contributions and recognize their work by nominating them for a 2025 TMS award.

**The nomination deadline for most 2025 TMS awards is April 1, 2024.**

Visit [awards.tms.org](https://awards.tms.org) to explore the many honors and awards available through TMS and to learn more about the nomination process. For additional information, contact Deborah Hixon, TMS Awards Program Manager, at [hixon@tms.org](mailto:hixon@tms.org).



# SOCIETY AWARDS

## TMS FELLOWS



**John Agren**

**Professor, Royal Institute of Technology**

**Citation:** For seminal contributions to the establishment of thermodynamic models, atomic mobility framework, and DICTRA software to enable computational design and simulations

of multicomponent materials.



**Jaroslaw Drelich**

**Professor, Michigan Technological University**

**Citation:** For pioneering research on zinc alloys and their medical applications and inspirational contributions to the science of wetting and interfacial engineering of materials.

"Since the beginning of my membership, TMS has always been my professional home, and source for continuing learning. TMS meetings offer and promote scientific and engineering ideas on novel and traditional materials, their conventional and alternative processing techniques, and advanced characterization methods. As compared to other societies that I had the opportunity to work with, TMS provides unconditional support to its members and persistently inspires them to explore new topics for symposia and technical sessions."



**Scott Mao**

**Professor, University of Pittsburgh**

**Citation:** For seminal contributions to the understanding of deformation physics and fracture of metals and nanomaterials, and the development of in-situ.

"I am honored and humbled to receive this TMS Fellow Award and grateful for the support and contributions from my students, collaborators, and colleagues. It is such an honor to join this distinguished group, one of the most selective in the world of materials science. TMS has played a significant role in my professional growth, where I have enjoyed many collaborations and friendships during the last 32 years. I also like to thank my wife for the greatest support to my work."



**Roger Narayan**

**Distinguished Professor, University of North Carolina at Chapel Hill/ North Carolina State University Joint Department of Biomedical Engineering**

**Citation:** For pioneering contributions to the use of laser-based additive

manufacturing and ablation methods to process biomaterials with micrometer and nanoscale features.

"TMS has provided me with an opportunity to interact with my colleagues in academia, government, and industry over the years. These interactions have had a significant influence on my research collaborators, including international collaborators, and the progression of my career."



**Eugene Olevsky**

**Dean and Distinguished Professor, San Diego State University**

**Citation:** For seminal contributions to the fundamental and applied research in materials science and engineering, especially regarding sintering science

and technology.

"I am extremely delighted and honored to be named a TMS Fellow. I am thrilled to join this distinguished group, one of the most selective in the world of materials science. I am very grateful to the talented students and collaborators I have worked with, for their tremendous contributions over the years. I look forward to continued involvement with the TMS community."



**Qigui Wang**

**Technical Fellow, General Motors**

**Citation:** For outstanding contributions to the understanding of fracture and fatigue of castings, and development of multiscale ICME models linking process, microstructure, and properties in aluminum castings.

"I am truly honored and deeply humbled to have been nominated and selected for the distinguished award of TMS Fellow. TMS has played a vital role in my professional career, providing the platform and opportunities to connect with materials professionals and experts worldwide and to leverage innovative materials technologies in my research. I am very grateful to TMS, and I am greatly indebted to my colleagues, students, mentors, supervisors, collaborators, and particularly my wife and daughter for all their support over the years."



**Yunzhi Wang**

**Professor, The Ohio State University**

**Citation:** *For outstanding contributions to advancing fundamental understanding of solid-state phase transformations and plastic deformation and developing/*

*implementing rigorous physics-based modeling/simulation tools for alloy design and processing.*

"I am absolutely thrilled and profoundly honored to receive the TMS Fellow Award, the highest accolade from this esteemed society. This recognition is a testament to the collective dedication and brilliance of everyone I've had the privilege to work, collaborate, and engage with throughout the years—especially my outstanding students, postdocs, and research scientists. As a professor, I see myself as the ambassador of their exceptional contributions, and this award is a celebration of our collaborative achievements."

## ALEXANDER SCOTT DISTINGUISHED SERVICE AWARD



**David Bahr**

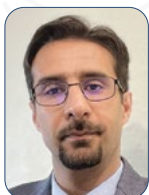
**Head, School of Materials Engineering, Purdue University**

**Citation:** *For more than a decade of service in two technical divisions and student development activities tied to growth and vibrancy of the Material*

*Advantage program.*

"Receiving the Alexander Scott Distinguished Service Award is truly an honor. Professional societies exist to support the members, and TMS has been instrumental in supporting students and professionals in materials engineering. I've had the privilege of helping others grow and develop, and I'm truly thankful for the opportunities TMS has provided to work across the breadth of the MSE field."

## BRIMACOMBE MEDALISTS



**Mohsen Asle Zaeem**

**Professor, Colorado School of Mines**

**Citation:** *For pioneering contributions to the field of computational study and design of materials, dedicated service to our technical community, and outstanding commitment to mentoring*

*young professionals.*

"I am deeply honored and truly humbled to be selected as a Brimacombe Medalist. I want to extend my heartfelt appreciation to TMS for providing an exceptional platform for the exchange of scientific knowledge, as well as for the invaluable support in fostering the growth and development of students, professionals, and leaders in our field. I would like to also acknowledge the incredible network of

mentors, colleagues, students, friends, and, above all, my family, who have stood by me with unwavering support and motivation throughout my journey. I am dedicated to giving back to the community by promoting and supporting the growth of individuals within TMS and beyond."



**Gisele Azimi**

**Professor, University of Toronto**

**Citation:** *For sustained excellence and achievement in the science and technology of next-generation batteries and urban mining and an exceptional and continuing service to TMS and the profession.*

"I am deeply honored and humbled to accept the prestigious award from TMS. This recognition is not just an acknowledgment of my work, but a testament to the unwavering support, guidance, and inspiration that I have received from the TMS community. TMS, to me, is not just an organization; it's a family of like-minded individuals dedicated to advancing the fields of materials science and engineering. Being a part of this community has been an incredible journey of personal and professional growth."



**Allison Beese**

**Professor of Materials Science and Engineering, Pennsylvania State University**

**Citation:** *For pioneering contributions to mechanics of additively manufactured monolithic and functionally graded*

*metals, and her commitment to services and mentoring a diverse population of scientists and engineers.*

"I am honored to be recognized as a Brimacombe Medalist and am extremely grateful to all those who have played a role in my scientific path thus far, including colleagues, mentors, students past and present, friends, and family. Over the years TMS has provided me with a scientific home as well as a wonderful network of talented collaborators and steadfast friends. I look forward to, and appreciate, the opportunity of continuing to be an active member of the community for years to come."



**Laurent Capolungo**

**Scientist, Los Alamos National Laboratory**

**Citation:** *For sustained excellence and achievement in multiscale modeling of plasticity and microstructure evolution in materials and dedicated mentoring of the next generation of materials scientists.*

"I am humbled and honored to receive this award and wish to express my deepest gratitude to my students and mentors. Over the years, TMS has largely contributed to my scientific growth and has been a unique venue to build a network of collaborators."



## BRIMACOMBE MEDALISTS (CONT.)



**Saryu Fensin**  
**Materials Scientist, Los Alamos National Laboratory**

**Citation:** *For pioneering contributions to understanding the mechanisms controlling damage evolution and failure in materials under high strain rates and extreme*

*conditions, and her continued dedication to TMS.*



**Daniel Kiener**  
**Professor, Montanuniversität Leoben**

**Citation:** *Pioneering in-situ micro and nanoscale methods to provide mechanistic insights into mechanical behavior of metals.*

"Attending a TMS Annual Meeting marked my inaugural experience at an international conference during my PhD studies, and since then, the TMS Society has become my scientific home. To be recognized as a J. Keith Brinacombe Medalist is a humbling and deeply honoring moment, and I am grateful for the remarkable colleagues, students, and mentors that I've had the privilege to work with and learn from over the years. Special gratitude goes to my wife and our children for their patience and tolerance, and, strengthened by their unwavering support, I look forward to continuing to contribute to the advancement of our Society for the betterment of humanity."



**C. Cem Tasan**  
**Associate Professor, Massachusetts Institute of Technology**

**Citation:** *For his unique contributions to in-situ microscopy testing, which led to improved physical understanding of the microstructural mechanisms in metals,*

*and to various high-performance alloys.*

"TMS has been my professional home throughout my journey, helping me learn more, connect more and do more. I am grateful for all this, and I thank the entire TMS family for this great honor."

## BRUCE CHALMERS AWARD



**Enrique Lavernia**  
**Professor, Texas A&M University**

**Citation:** *For innovative and pioneering studies on the fundamental mechanisms that govern the interrelationship between processing, microstructure, and mechanical behavior of structural materials.*

"I am surprised and humbled by this recognition. I want to thank the many students and colleagues who have enriched my personal and professional life and contributed to this award. I am also grateful to TMS, a society I joined in 1982 as a graduate student."

## CYRIL STANLEY SMITH AWARD



**Long-Qing Chen**  
**Hamer Professor of Materials Science and Engineering, Pennsylvania State University**

**Citation:** *For outstanding contributions to computational understanding of materials microstructures.*

"My entire academic career has been devoted to developing computational models for studying and understanding microstructure evolution processes during phase transformations, grain growth, and precipitate coarsening. I feel truly honored to receive the TMS Society Award named after Professor Cyril Smith who made pioneering and inspiring contributions to the science of materials microstructure and grain topology."

## ELLEN SWALLOW RICHARDS DIVERSITY AWARD



**Andrea Hodge**  
**Professor, University of Southern California**

**Citation:** *For her life-long commitment to diversity as a mentor of women and underrepresented groups in science and engineering.*

"TMS is my home society, and I am a lifetime member. I am so proud to receive this award highlighting the role and impact of having diverse voices. I want to thank the many before me who made the path I now walk on; you were so brave to start so that others could follow."

## FRANK CROSSLEY DIVERSITY AWARD



**Jonathan Madison**  
**Program Director, National Science Foundation**

**Citation:** *For overcoming personal and cultural adversity to achieve a successful career in materials science and leveraging his experiences to enable*

*the success of others.*

"Frank Crossley's life and accomplishments have demonstrated that even in science, while challenges exist, if there can be a first, there can be many more. I am honored to be one of the 'many more.' Frank forged a trail, and these many years later, I am beyond honored to look past my challenges to be able to follow in his footsteps as a metallurgist and a materials scientist."

## INSTITUTE OF METALS LECTURER & ROBERT FRANKLIN MEHL AWARD



**Hamish Fraser**  
**Professor, The Ohio State University**  
**Citation:** For scientific leadership and impact on integrated computational materials engineering by coupling processing and characterization with materials modeling, providing solutions to problems in physical metallurgy.

**Presentation:** "Optimization of Microstructure of Titanium Alloys Processed using Additive Manufacturing"

## JULIA AND JOHANNES WEERTMAN EDUCATOR AWARD



**Kannan Krishnan**  
**Professor, University of Washington**  
**Citation:** For his transformative discoveries in magnetic materials and materials characterization with applications ranging from information technologies to biomedicine, the quality and impact of his scholarship, including publications, lectures, and two seminal textbooks, and his recognized dedication to educating the next generation of materials scientists and engineers worldwide.

"It is indeed a great honor to receive the Weertman award. I have met Professor Weertman on multiple occasions and have always been very impressed and motivated with their commitment to educating the next generation of materials scientists and engineers. I am also humbled to be in the company of the numerous other distinguished educators, some of whom have been my teachers, who have been recognized with this award."

## LEADERSHIP AWARD



**Noam Eliaz**  
**Professor, Tel Aviv University**  
**Citation:** For his academic and scientific leaderships; founding DMS&E at Tel Aviv University; development of materials and processes for biomedical industries; his enormous impact on Israel's defense.

"I am thrilled beyond words to have been selected to receive the TMS 2024 Leadership Award. I am grateful to TMS, my nominators, research group members throughout my academic career, colleagues, and my dear wife and kids for their invaluable contribution, support, and love. I thank TMS for giving me, my Faculty of Engineering, and my university a bit of light in an otherwise dark time."

## MORRIS COHEN AWARD



**Javier Llorca**  
**Professor, Polytechnic University of Madrid and IMDEA Materials Institute**  
**Citation:** For pioneering application of computational tools and scale bridging techniques to the design of materials and the associated manufacturing routes.

## OLEG D. SHERBY AWARD



**Alan Ardel**  
**Professor Emeritus/Research Professor, University of California, Los Angeles**  
**Citation:** For his novel work on the high temperature creep of metals and alloys as well as his seminal work on the high temperature coarsening of precipitates.

"I am delighted and honored to receive the Oleg D. Sherby Award for 2023, especially since Professor Sherby was my PhD supervisor. It is also an honor to join the list of past recipients of this TMS award. TMS has been an invaluable resource ever since I joined as a student. If you are judged by the company you keep, I am indeed in superb company."

## RESEARCH TO INDUSTRIAL PRACTICE AWARD



**Bruce Pint**  
**Interim Section Head, Oak Ridge National Laboratory**  
**Citation:** For widespread impact in the industrial application of high-temperature materials & corrosion research to the energy industry including turbines, nuclear power, recuperators, boilers, and advanced cycles.

"I would like to thank TMS for this award and those who nominated me. I've had the opportunity to work on a number of great projects for the Department of Energy that have benefited U.S. companies and helped create and maintain jobs in this country. I also would like to thank my mentors including Linn Hobbs at MIT, Dennis Hetzner at Timken, and Peter Tortorelli, Ian Wright, Jim DiStefano, and Jack DeVan at Oak Ridge National Laboratory and a special mention to the technicians in the corrosion group that make the experiments happen."



## SADOWAY MATERIALS INNOVATIONS AND ADVOCACY AWARD



**Yiannis Pontikes**  
**Associate Professor, Katholieke Universiteit Leuven**  
**Citation:** *For reducing the climate impact of the metallurgical and construction sectors through science, collaboration, and entrepreneurship; establishing the*

*Journal of Sustainable Metallurgy; inspiring future generations.*

"This award is a great honor, and I wholeheartedly thank the Society. It bears the name of a professor I have been inspired by, and it will serve as a reminder that we have so much to do in the area of sustainable processing for sustainable materials. We need to ask 'why' and 'why not,' and eventually challenge perceptions, reconsider our choices, and deliver realistic options. And while doing so, it is also vital that we empower the younger ones to go one step further than us."

## WILLIAM D. NIX AWARD



**Tresa Pollock**  
**Alcoa Distinguished Professor of Materials, University of California, Santa Barbara**  
**Citation:** *For seminal contributions to the creep and fatigue behavior of structural alloys and underlying deformation*

*mechanisms, and for inexhaustible devotion to the mentoring of early career scientists.*

"I am truly honored and humbled to receive the TMS William D. Nix award. Professor Nix is an icon of our field that I have long viewed as the model for academic achievement, with seminal research contributions to the mechanical behavior of structural materials, thin films, and nanocrystalline materials and exceptional dedication to mentoring an entire generation of highly successful materials scientists."

**Presentation:** "Designing Fatigue Resistant Structural Materials"

## WILLIAM HUME-ROTHERY AWARD



**Yunzhi Wang**  
**Professor, The Ohio State University**  
**Citation:** *For outstanding contributions to advancing fundamental understanding of solid-state phase transformations and plastic deformation and developing/ implementing rigorous physics-based*

*modeling/simulation tools for alloy design and processing.*

**Presentation:** "Deformation Pathway Engineering and Compositionally and Structurally Modulated Alloy Design"

# AIME AWARDS

## AIME HONORARY MEMBERSHIP AWARD



**Carolyn Hansson**  
**Distinguished Professor Emerita, University of Waterloo**  
**Citation:** *For pioneering contributions to our understanding of the behavior of materials and applying it to industry, her promotion of knowledge*

*exchange, her leadership within professional societies, her inspirational guidance to young women in engineering; all these embody her lifetime outstanding achievements.*

"I first registered as a member of the Metallurgical Society of AIME in 1968, and TMS has been my professional home ever since. I have developed several very deep friendships through the Society, which have provided me with kindness and support throughout all phases of my professional life."

## AIME CHAMPION H. MATHEWSON AWARD

**Donald Brown, Los Alamos National Laboratory; Veronica Anghel, Los Alamos National Laboratory; Levente Baloch, Queens University; Bjorn Clausen, Los Alamos National Laboratory; Nathan S. Johnson, Research Microscopy Solutions; Ramon Martinez, Los Alamos National Laboratory; Darren C. Pagan, Pennsylvania State University; Gennady Rafailov, Nuclear Research Center of the Negev; Lucas Ravkov, Queens University; Maria Strantz, Livermore National Laboratory; Eloisa Zepeda-Alarcon, Los Alamos National Laboratory**

**Paper:** "Evolution of the Microstructure of Laser Powder Bed Fusion Ti-6Al-4V During Post-Build Heat Treatment," *Metallurgical and Materials Transactions A*, December 2021.

## AIME ROBERT LANSING HARDY AWARD

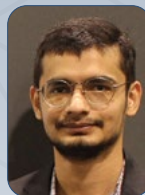


**Darren Pagan**  
*Assistant Professor, Pennsylvania State University*

**Citation:** *For innovative synchrotron x-ray characterization experiments coupled with simulations giving unique insights into the micromechanical and macroscopic behavior of materials.*

"Thank you to the Society and my nominators for this award. This recognition by the TMS community means a lot to me. I look forward to continuing to develop my career and contribute to TMS."

## AIME ROSSITER W. RAYMOND MEMORIAL AWARD



**Nikhil Dhawan and Himanshu Tanvar**  
(pictured), *Worcester Polytechnic Institute*

**Paper:** "Microwave-Assisted Carbothermic Reduction of Discarded Rare Earth Magnets for Recovery of Neodymium and Iron Values," *JOM*,

January 2021.

## AIME JAMES DOUGLAS GOLD MEDAL



**Thomas Battle**  
*Extractive Metallurgy Consultant*

**Citation:** *For his significant contributions to the metallurgical industry and world.*

# ACTA MATERIALIA AWARDS

## GOLD MEDAL AWARD



**Kazuhiro Hono**  
*NIMS Fellow & Director of Magnet Materials Center, National Institute for Materials Science*

**Presentation:** "Nanostructure and Magnetic Materials"

## SILVER MEDAL AWARD



**Jean-Philippe Couzinie**  
*Professor, CNRS & Universite Paris Est Creteil*

**Presentation:** "Thermodynamic (In) stability and Deformation Mechanisms of Refractory Complex Alloys"

## HOLLOMON MATERIALS AND SOCIETY AWARD



**Iver Anderson**  
*Senior Metallurgist, Iowa State University Ames Laboratory*

**Presentation:** "Materials Research to Propel Us into an Environmentally Conscious Economy for Generations to Come"

## MARY FORTUNE GLOBAL DIVERSITY AWARD



**Lynnette Madsen**  
*Visiting Professor, Cornell University/ National Science Foundation*

**Presentation:** "Prioritizing Diversity and Inclusion for Achieving Excellence: An Embedded Approach"



# CONGRATULATIONS TO THE 2024 TMS DIVISION AWARD RECIPIENTS

Jillian Schultz



The TMS technical divisions recognize work performed in specific technical interest areas. For 2024, the following awardees are honored for their achievements in a particular realm of expertise. Many of these recipients will be presented with their awards at the various division lunches and technical sessions held throughout the TMS 2024 Annual Meeting & Exhibition (TMS2024) in Orlando, Florida, USA, scheduled for March 3–7, 2024.

To discover more about each of these awards and their current and past recipients, visit [awards.tms.org](https://awards.tms.org). Congratulations to all the awardees!

## 2025 TMS AWARDS NOMINATIONS DUE APRIL 1

Do you have a colleague who has made a significant impact on their field? Have they been of great service to their community or to TMS? Honor their contributions and recognize their work by nominating them for a 2025 TMS award.

**The nomination deadline for most 2025 TMS awards is April 1, 2024.**

Visit [awards.tms.org](https://awards.tms.org) to explore the many honors and awards available through TMS and to learn more about the nomination process. For additional information, contact Deborah Hixon, TMS Awards Program Manager, at [hixon@tms.org](mailto:hixon@tms.org).

## EXTRACTION & PROCESSING DIVISION (EPD) AWARDS

### EPD DISTINGUISHED LECTURER AWARD



**George Demopoulos**  
*Gerald G. Hatch Chair Professor, McGill University*

**Citation:** *For outstanding research contributions in hydrometallurgy and advanced energy material processing as evident by an exceptional record of graduate student training, impactful publications, and technology transfer.*

**Presentation:** "Advanced Hydrometallurgical Process Innovations: Clean Environmental Applications and Sustainable Electrochemical Energy Materials and Technologies"

### EPD DISTINGUISHED SERVICE AWARD



**Joel Kapusta**  
*Subject Matter Expert, Sonic Injection and Pyrometallurgy, BBA, Inc*

**Citation:** *In recognition to his outstanding leadership role supporting mutual collaboration among professional societies and his worldwide recognized technical expertise in sonic injection.*

"I vividly remember to this day the words of Professor Keith Brimacombe in his graduate course back in early 1991 during my first month in the PhD program at the University of British Columbia: 'Being an active member of your professional societies is a must for the growth of your career as a metallurgical engineer.' I signed up as a student member in both TMS and MetSoc that same month and actively participated in the activities of each society since then. Receiving this award today represents for me a recognition from my peers that my long-lasting services to TMS and MetSoc was not just good for my own personal growth, as per the wisdom of Professor Brimacombe, but was also beneficial for my extractive metallurgy community. I am therefore greatly honored to receive this prestigious award."

### EPD PYROMETALLURGY BEST PAPER AWARD

**Thomas Wolfinger, Paul Wurth, Daniel Spreitzer, Primetals Technologies Austria GmbH; Heng Zheng and Johannes Schenk, Montanuniversitaet Leoben**

**Paper:** "Influence of a Prior Oxidation on the Reduction Behavior of Magnetite Iron Ore Ultra-Fines Using Hydrogen," *Metallurgical and Materials Transactions B*, February 2022.

### EPD TECHNOLOGY AWARD

**Huimin Tang, Zhiwei Peng, Mingjun Rao, Guanghui Li, Central South University; Liancheng Wang, Central South University/Guangxi Liuzhou Iron and Steel Group; Anton Anzulevich, Chelyabinsk State University**

**Paper:** "Direct Conversion of Electric Arc Furnace Dust to Zinc Ferrite by Roasting: Effect of Roasting Temperature," *Journal of Sustainable Metallurgy*, February 2023.

### NAGY EL-KADDAH AWARD FOR BEST PAPER IN MHD IN MATERIAL PROCESSING

**Angshuman Podder, Kenneth Coley, and Andre Phillion, McMaster University**

**Paper:** "Mathematical Study of the Formation Mechanisms of Complex Oxide Inclusions in Si-Mn-Killed Steel," *Metallurgical and Materials Transactions B*, December 2022.

### EPD MATERIALS CHARACTERIZATION BEST PAPER AWARD

#### FIRST PLACE

**Marcel Goerz, Mathias Liewald, Kim Riedmüller, and Adrian Schenek, Institute for Metal Forming Technology**

**Paper:** "Evaluation of Feature Engineering Methods for the Prediction of Sheet Metal Properties by an Artificial Neural Network from Punching Force Curves," *Characterization of Minerals, Metals, and Materials*, February 2023.

#### SECOND PLACE

**Xiaolei Fang, Zhiwei Peng, Mingjun Rao, Lei Yang, and Guangyan Zhu, Central South University**

**Paper:** "Conversion of Ferronickel Slag to Thermal Insulation Materials by Microwave Sintering: Effect of Fly Ash Cenosphere Addition," *Characterization of Minerals, Metals, and Materials*, February 2023.

#### THIRD PLACE

**Pei Liu, Natural Resources Canada**

**Paper:** "The Power and Limitation of Ion Beam Imaging in Focused Ion Beam Microscopes," *Characterization of Minerals, Metals, and Materials*, February 2023.

### EPD MATERIALS CHARACTERIZATION BEST POSTER AWARD

#### FIRST PLACE

**Jonathan Putman, Ellen Williams, and Peyton Willis, Exum Instruments**

**Poster:** "An Innovative Instrument Determines Chemistry at the Scale of 3D Printing"



## FUNCTIONAL MATERIALS DIVISION (FMD) AWARDS

### FMD DISTINGUISHED SCIENTIST/ ENGINEER AWARD



**Hannes Schniepp**  
*VMEC Professor of Applied Science,  
William & Mary*  
**Citation:** For exceptional contributions  
in development of structure-property  
relationships in complex biological  
materials such as spider silk and their  
biomimetic applications.

"TMS is the community that has become a professional home to me and that has opened many doors for me. I have always been very proud and happy to be a member, and receiving this award means so much to me! TMS has helped me to develop meaningful, deep, and long-standing relationships with colleagues from all over the world, and I look forward to continuing to participate and contribute to this wonderful society."

### FMD JOHN BARDEEN AWARD



**Darrell Schlom**  
*Tisch University Professor, Cornell  
University*  
**Citation:** For his pioneering work on the  
synthesis of functional oxide materials  
using molecular beam epitaxy.

"This award means a tremendous amount to me. John Bardeen was a scientific gentleman—a gentle role-model for how science should be done—who improved the world through his research on semiconductors and superconductors, all while remaining humble. I recall seeing him speak at a superconductivity conference when I was a graduate student, and it warms my heart to join those receiving this award given in his memory."

### FMD JOURNAL OF ELECTRONIC MATERIALS BEST PAPER AWARD

**Jing Chen, Jiancheng Tang, Nan Ye, and Chenyu Zhang, Nanchang University**

**Paper:** "Ultrathin V3S4 Embedded in Three-Dimensional Carbon Framework with V-C Bonding Towards Alkali-Ion Batteries," *Journal of Electronic Materials*, July 2023.

## LIGHT METALS DIVISION (LMD) AWARDS

### LMD TECHNOLOGY AWARD



**Kevin Anderson**  
*Brunswick Senior Fellow, Brunswick  
Corporation*  
**Citation:** Dr. Anderson was instrumental  
in the designing of the Mercalloy family  
of aluminum alloys and advances in  
metals recycling through the invention of  
innovative aluminum alloys.

"As a member of TMS since college, TMS has always been at the forefront of materials technology. Having worked in the light metals industry my entire career, it is very humbling to be recognized by the Light Metals Division where so many experts have contributed to our profession."

### LIGHT METALS AWARD

**Zachary J. Post, Walter R. Zimbeck, Steven M. Storck, John D. Boldt, Steven R. Szczesniak, Ryan H. Carter, Robert K. Mueller, Salahudin M. Nimer, Douglas B. Trigg, Michael A. Berkson, M. Frank Morgan, and William H. Swartz, Johns Hopkins University; and Floris van Kempen, Gerard C.J. Otter, and Ludger van der Laan, The Netherlands Organization for Applied Scientific Research**

**Paper:** "Material Evaluation Framework of Additively Manufactured Aluminum Alloys for Space Optical Instruments," *Light Metals* 2023.

### LMD JOM BEST PAPER AWARD

**Miao Yu, Bhaskar Reddy Sudireddy, and Ming Chen, University of Denmark; and Xiaofeng Tong, North China Electric Power University**

**Paper:** "Performance and Durability of Reversible Solid Oxide Cells with Nano-electrocatalysts Infiltrated Electrodes," *JOM*, December 2022.

## LIGHT METALS SUBJECT AWARDS

### Alumina/Bauxite

Rodrigo Neves, Fernando Melo, Everton Mendonca, Erinaldo Filho, and Jeferson Carneiro, *Hydro Alunorte - Alumina do Norte do Brasil*

**Paper:** "Reduction of GHG Emissions and Increase Operational Reliability Using Immersed Electrode Boiler in an Alumina Refinery," *Light Metals 2023*.

### Aluminum Reduction Technology

Mustafa Mustafa, Nadia Ahli, Abdalla Alzarooni, Konstantin Nikandrov, Aslam Khan, Hassan Al Hayas, Marwan Al Ustad, and Sajid Hussain, *Emirates Global Aluminium*

**Paper:** "Preheat, Start-Up and Early Operation of DX+ Ultra Pots at 500 kA," *Light Metals 2023*.

### Electrode Technology for Aluminum Production

Anders Sorhuus, and Eivind Holmefjord, *REEL ECS*; Vrauke Zeibig and Omer Mercan, *TRIMET Aluminium SE*; and Elmar Sturm, *ESC-Consulting*

**Paper:** "AHEX Full Scale Experiences at TRIMET Aluminium SE," *Light Metals 2023*.

### Warren Peterson Cast Shop for Aluminum Production

Emanuele Pagone, Christopher Jones, Mark Jolly, and Konstantinos Salonitis, *Cranfield University*; and John Forde and William "Ben" Shaw, *Sylatech Ltd.*

**Paper:** "Defect Minimisation in Vacuum Assisted Plaster Mould Investment Casting through Simulation of High Value Aluminium Alloy Components," *Light Metals 2023*.

### Recycling

Himanshu Tanvar and Brajendra Mishra, *Worcester Polytechnic Institute*

**Paper:** "Recovery of Value Added Products from Bauxite Residue," *Light Metals 2023*.

## LMD MAGNESIUM TECHNOLOGY AWARDS

### Best Poster

Robert Král, Peter Minárik, Jitka Stráská, and Jozef Veselý, *Charles University*; and Jiří Kubásek, *University of Chemistry and Technology*

**Title:** "Flammability Resistant Magnesium Alloys Processed by Equal Channel Angular Pressing," *Magnesium Technology 2023*.

### Application

Rongbin Li and Fengqin Liu, *University of Science and Technology Beijing*; Jinhui Liu, Peixu Yang, and Shaojun Zhang, *Zhengzhou University*; and Michael Ren, *Sunlightmetal Consulting Inc*

**Paper:** "Development of Compound-vertical-retort Technology for Magnesium Production and its Application," *Magnesium Technology 2023*.

### Fundamental Research

Birte Hindenlang, Jan Bohlen, Joao Pereira da Silva, Jianan Gu, Florian Wieland, Fabian Wilde, and Domonkos Tolnai, *Helmholtz-Zentrum Hereon*, and Anais Louapre, *Polytech Nantes*

**Paper:** "In Situ Study of the Degradation Behaviour Under Load of Mg<sub>1.8</sub>Y<sub>0.6</sub>Zn<sub>1</sub>Ag Using Synchrotron Tomography," *Magnesium Technology 2023*.

### Student Paper

Thomas Avey, Jiashi Miao, and Alan Luo, *The Ohio State University*; Joshua Caris, *Terves Inc*; and Anil Sachdev, *General Motors Global Research and Development*

**Paper:** "Processing Map and Performance of a Low-cost Wrought Mg Alloy: ZAXEM11100," *Magnesium Technology 2023*.

## JOINT DIVISION AWARDS

### EPD/LMD JOURNAL OF SUSTAINABLE METALLURGY BEST PAPER AWARD

Koen Binnemans and Peter Tom Jones, *Katholieke Universiteit Leuven*

**Paper:** "The Twelve Principles of Circular Hydrometallurgy," *Journal of Sustainable Metallurgy*, March 2023.

### LMD/EPD ENERGY BEST PAPER AWARDS

#### Professional

Aida Amroussia, Patrick Brennan, Voramon Dheeradhada, Phil Gilston, Anteneh Kebede, Steve Lombardo, Tamara Russell, Patrick Shower, Martin Morra, and Scott Weaver, *General Electric Global Research*; Suresh Babu and Michael Pagan, *University of Tennessee*; and Bruce Pint, *Oak Ridge National Laboratory*

**Paper:** "Corrosion and Erosion Protection to Accelerate Deployment of Sustainable Biomass", *Energy Technology 2023*, February 2023.

#### Student

Nawshad Haque, *CSIRO Energy*, and Aulia Qisthi Mairizal, M. Akbar Rhamdhani, Agung Yoga Sembada, and Kwong Ming Tse, *Swinburne University of Technology*

**Paper:** "Carbon Footprint Assessment of Waste PCB Recycling Process through Black Copper Smelting Route in Australia," *Energy Technologies 2023*, February 2023.



## MATERIALS PROCESSING & MANUFACTURING DIVISION (MPMD) AWARDS

### MPMD DISTINGUISHED SCIENTIST/ENGINEER AWARD



**Rajiv Mishra**  
*Regents Professor, University of North Texas*

**Citation:** For broadening the friction stir welding technology into a generic microstructural modification and manufacturing process, known as friction

stir processing, and developing its scientific understanding.

"TMS-MPMD, particularly the Shaping and Forming Committee, provided me a wonderful opportunity to organize the friction stir welding and processing symposium that became an integral part of my career growth. Much of my research contributions correlating the processing-microstructure-properties came out from these activities, and ultimately that led to founding of the start-up named Optimus Alloys."

### MPMD DISTINGUISHED SERVICE AWARD



**Megan Cordill**  
*Deputy Director, Erich Schmid Institute of Materials Science*

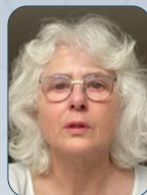
**Citation:** For dedication to MPMD as an editor, symposium organizer, and board member, and for championing diversity, equity and inclusiveness across our

Division and Society.

"Throughout my career, not only have I strived to expand and develop the science behind materials, I have also encouraged other scientists and engineers to enter the field and do the same. I joined TMS as an undergraduate and have remained an active member because of TMS's forward thinking towards creating a more diverse materials organization where all are recognized. I am honored by this award and look forward to furthering TMS aspirations."

## STRUCTURAL MATERIALS DIVISION (SMD) AWARDS

### SMD DISTINGUISHED SCIENTIST/ENGINEER AWARD



**Catherine Rae**  
*Professor, Emmanuel College*

**Citation:** For her distinguished services to nickel superalloy metallurgy, in terms of teaching and in conducting fundamental and applied research for the benefit of industry.

"TMS does a terrific job for the materials community at all levels from professionals in industry and academia to promoting materials to the next generation of specialists in schools. I am very proud to be given this award and would like to thank my sponsors and TMS Foundation."

### SMD DISTINGUISHED SERVICE AWARD



**Brad Boyce**  
*Distinguished Member of the Technical Staff, Sandia National Laboratories*

**Citation:** For extensive contributions and impactful service to the Structural Materials Division, to TMS, and to the profession of Materials Science.

### SMD JOM BEST PAPER AWARD

**Yi Yao, Feng Yan, and Lin Li, Arizona State University; and Timothy Sullivan IV and Jiaqi Gong, University of Alabama**

**Paper:** "Machine Learning-Guided Exploration of Glass-Forming Ability in Multicomponent Alloys," *JOM*, December 2022.



# JOM Talks with 2023 TMS President Brad Boyce

Kelly Zappas

**Brad Boyce**, distinguished member of the technical staff at Sandia National Laboratories, completes his term as 2023 TMS president at the TMS 2024 Annual Meeting & Exhibition, March 3–7, 2024, in Orlando, Florida, USA. In this conversation with *JOM: The Magazine*, Boyce reflects on his experiences as TMS President and discusses his hopes for the Society's future.

**JOM: Overall, how would you describe your experience as TMS president?**

**Brad Boyce:** This past year has been the experience of a lifetime. It has been a true honor to serve as the leader of this important society for a year. From that vantage point, I've had a chance to get a unique look at so many facets of our organization. I've spoken with members at every stage of their career from undergraduate students (the Materials Bowl competition was a favorite of mine!) to retirees. I've interacted with volunteers at every stage of their involvement in TMS, from first-time committee members to past presidents. I've collaborated with executive directors and presidents at many of the numerous societies related to the materials profession. And finally, I've had a chance to interact with nearly the entire staff of full-time and part-time employees at TMS headquarters, some of whom have spent their entire career working behind the scenes to serve our community. Through all of that, I've seen how valuable TMS is to our profession, and I've also seen how the constellation of people around TMS are what makes this organization as great and enduring as it has been.

**JOM: What unique challenges did you face during your Presidential year?**

**Boyce:** When I applied to be president, I had several objectives in mind, many of which I've seen progress during my tenure. But far and away, the most significant challenge has been one that I hadn't seen coming five years ago. While the COVID pandemic is mostly in our rearview mirror (and hopefully stays there!), the after-effects of COVID presented a significant danger to not just TMS, but nearly all professional societies. One of our cornerstones, and

a significant source of our fiscal viability, comes from bringing people together for in-person meetings, where ideas are exchanged and bonds are developed. COVID threw a wrench in that for several years in a row. Only now are we starting to see a full return to the level of in-person involvement that we had before COVID.

As a result of those down years, the Society faced a significant drop in revenue. In spite of decades of planning by the Board of Directors to build a significant financial reserve for rainy-day scenarios, in 2022, we faced a historically bad financial deficit. The Board and the TMS staff recognized that it was clearly unsustainable and threatened the long-term viability of the Society. It was a clear-and-present possibility that TMS would no longer function if we did not take action. Through 2022 and 2023, the Board advised TMS Executive Director Jim Robinson and his staff to make very hard decisions about how to streamline the operation of TMS. The most immediate impact was on staff; it breaks my heart that some positions had to be eliminated—and even those staff who stayed on had to take on new responsibilities as roles were consolidated. But it also affected volunteers who were constrained from taking on new initiatives that were not of immediate fiscal value and who had to be mindful of less staff availability to execute new ideas, or even sustain some of our less impactful ongoing activities.

I'm thrilled and honestly relieved to report that the light at the end of the tunnel seems to be quite visible. Through concerted efforts and substantial handwringing, we are now projecting a positive budget for 2024. This represents an approximately \$2 million dollar swing associated with increased revenue and decreased expenses. In all categories, our numbers now look a lot more like they did before the pandemic. The slope of the trendlines are positive and while in some ways we are not yet "stronger than before," I see the real possibility emerging that TMS is back on a growth trajectory. Member numbers are up, the budget is now projecting positive, attendance is generally near record highs and growing, the philanthropic TMS Foundation had a banner year in donations, and the spectrum of services that TMS provides is back on the rise.



## JOM: What do you consider to be your greatest contribution as TMS President?

**Boyce:** The most important thing I've done as president is to thank people and recognize their contributions. As the figurehead for the organization, I am in awe of the collective contributions of staff, volunteers, members, and the profession at large. We accomplish so much as a profession and as a society, because of these contributions. While we formally recognize some contributions through our awards, it's been my pleasure and duty to thank everyone along the way—from the Board members who spend many weeks of their year serving TMS to the committee members who serve as boots on the ground to keep the profession moving along.

## JOM: What have you found most fulfilling about serving as president?

**Boyce:** Interfacing with people who care a lot about our profession has given me enormous energy this year—and I've needed every bit of that energy through what seems like a thousand "Teams" or "Zoom" calls! But all the in-person interactions have been particularly rewarding. I've traveled to our own major conferences, meetings with the AIME Board of Directors (the American Institute of Mining, Metallurgical, and Petroleum Engineers is TMS's historical parent organization where we still play an important role as one of the four spinoff societies), conferences for other sister societies, and several universities. Everywhere I went, I had a great time talking with people, hearing about their stories, and working together to advance the profession.

## JOM: What lessons are you taking with you from your presidential experience?

**Boyce:** For me, personally, I have really enjoyed growing by witnessing and practicing leadership acumen. TMS is a society of leaders. Our members are key employees in their home organizations, often in various levels



At the Materials Science & Technology 2023 (MS&T23) technical meeting and exhibition, Brad Boyce presents Alan Luo with a certificate of appreciation for acting as the TMS plenary speaker at MS&T23.

of program leadership or management. And each of them brings their own experience with how to manage and how to lead. On top of that, TMS benefits from an extremely professional staff, starting at the top with Jim Robinson who has been with TMS for four decades this year and who has surpassed a decade as executive director. I have really benefited from observing the wide variety of leadership styles, and the way that TMS brings them all together and provides a structured framework for progress. I have grown to understand and respect how TMS's processes create a level playing field for inclusive contributions to the Society, allowing a place for every member to have a voice, and for prevailing attitudes to surface through democratic processes. In addition, I'm seeing how there is not a one-shoe-fits-all approach to leadership. Different situations, and different people, require different leadership strategies. I now realize that to be a most effective leader, my own leadership style must adapt to meet the situation, the people/organization, and the objectives.

## JOM: In your speech at the TMS 2023 Annual Meeting & Exhibition at the beginning of your tenure, you mentioned that TMS has a rich heritage, but also has a responsibility to evolve and adapt as a Society. What are some ways you see TMS evolving in the future?

**Boyce:** In my mind, one of TMS's key roles is to facilitate communication. Conferences, publications, committee meetings, public outreach—these are some of the most important roles that TMS plays. Our existing communication services are not perfect, but they are well established, solid, and generally respected. But the way the world transmits and absorbs information is changing. I hope to see TMS not just rest on what-worked-before, but also hone its skills at new modes of information sharing and collaboration.



In his role as president, Brad Boyce (center) acted as host for the 2023 TMS Materials Bowl Competition held at the TMS 2023 Annual Meeting & Exhibition. Here, he presents the Materials Bowl trophy to the winning team, the Minnesota Twins, who represented the University of Minnesota-Twin Cities. Team members are (from left to right): Regina Gonzalez Lona, Ashlie Hamilton, Trevor Totten, and Moujhuri Sau.



# A GEM OF A JOURNAL: CELEBRATING *JOM*'S DIAMOND JUBILEE

KAITLIN CALVA

**From aluminum to archaeology to academic advice.  
 From fireworks to failure analysis to great works of fiction.  
 From powder materials to policy changes to postage stamps.  
 From titanium to children's toys to the *RMS Titanic*.  
 In 75 years, *JOM* has covered it all—and then some.**

*The Journal of Metals*, renamed *JOM* in 1989, was created to satisfy a basic need for members of the Metals Branch of the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME). James B. Austin summed this up in his account, "History of The Metallurgical Society of AIME," from the 1971 AIME Centennial Volume, "Obviously it was considered essential that there be a permanent record of the Proceedings of the Institute. . . . But the need for a

more prompt outlet for information that should be made quickly available to the members was also recognized." In reality, *JOM* is so much more than either of these things.

*JOM* is an integral part of TMS. It's a destination for disseminating scientific breakthroughs, keeping up with emerging topics and trends, and revealing research results. It's one of many vehicles by which the Society communicates important changes



to bylaws or benefits, solicits contributions for the technical journal and other publications, and announces the latest events for members to attend. On the flip side, it's a place for TMS members to share their own news within the minerals, metals, and materials community. Where they can connect with others not only through their technical work, but also their promotions or achievements and celebrate both common interests and different experiences.

The initial release included 11 articles, the 1949 AIME Annual Meeting program, member news and meeting minutes from the Metals Branch of AIME, and nine technical papers from *Metals Transactions* (a precursor to today's *Metallurgical and Materials Transactions* family of journals). For comparison, the January 2024 issue included eight articles in the member magazine, 27 journal papers, and a Pre-Show Report for the TMS 2024 Annual Meeting & Exhibition. Spanning both print and online formats, *JOM* has deftly evolved with the times to remain a relevant and preferred source of information for its readers.

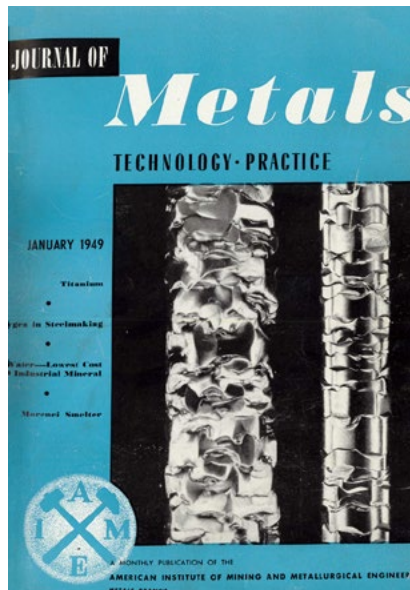
Countless volunteers, authors, and TMS staff have spent an immeasurable amount of time carefully reviewing technical manuscripts, meeting previews and programs, and member news for more than 900 issues. That's a lot of content to curate, be it a roundtable discussion on additive manufacturing, an investigation into the extraction of rare earth metals, or an analysis of alloy composition and uses.

The technical topics, delivery methods, and graphic designs may have changed since 1949, but you can always count on *JOM* as part of your home with TMS.

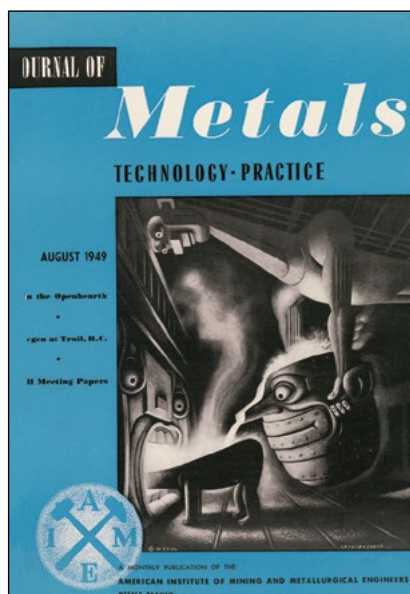
## JOM Through the Years

In honor of this Diamond Jubilee, *JOM* flipped its pages all the way back to January 1949 to present a selection of covers and images to help illustrate its broad scope and reach across the scientific community.

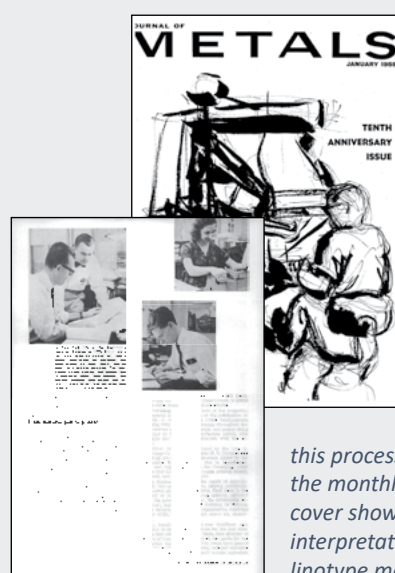
Kaitlin Calva is an independent contractor providing writing support for TMS and *JOM: The Magazine*.



The Metals Branch of the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME) debuted the first issue of *Journal of Metals* in January 1949.



The August 1949 cover features the work of surrealist Boris Artzybasheff. This illustration, *Making of Steel: Charging the Open Hearth*, is from Artzybasheff's *Machinalia* collection featured in his book *As I See*.

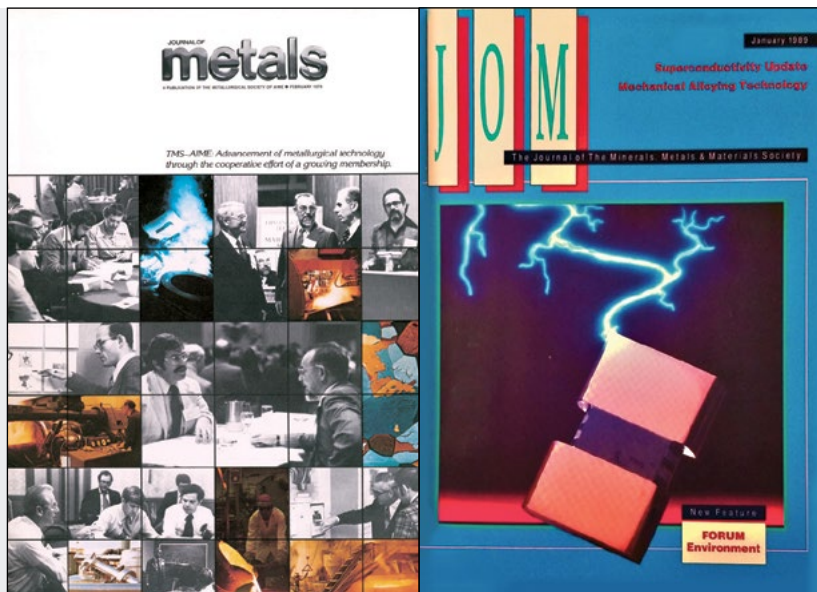


January 1959 marked 10 years for the journal and featured a tour through the printing process at the New Hampshire Engraving Corp. in Manchester, New Hampshire, where *Journal of Metals* was produced. Additionally, this article shared how AIME staff worked in cooperation with

this process to plan, write, and edit the monthly journal. This issue's cover shows artist David Cain's interpretation of working at the linotype machine.



This collage-style cover from February 1979 gets to the heart of the Society through a balance of people-focused images, representing the tradition of gathering to discuss scientific advances, collaborate on projects, and develop lasting professional relationships and personal friendships; and technical images, representing how TMS members advance the community through their research and work.



The Journal of Metals became JOM in January 1989 to better reflect the publication's broadening scope and interests of its readers and authors. "It is a designation which not only secures our ties with our past, but encourages us to explore the ever-widening realms of processes, materials, and applications," wrote then-managing editor James J. Robinson in the first installment of his "In the Final Analysis" editorial.

In 1997, JOM introduced a brand-new component of the publication: JOM-e, as seen advertised on the April 1997 cover here. This new electronic supplement to the physical magazine featured full articles, color artwork, animations, video and audio clips, downloadable resources, and links to related sites and references.



In February 2007, JOM commemorated 50 years of TMS as a member society of AIME with the celebratory cover art shown here. Over the February and March 2007 issues, JOM presented the results of its Greatest Materials Moments project which surveyed TMS members worldwide to identify the top 50 moments in materials history.

JOM celebrated 70 years in 2019 with a commemorative pin gifted to attendees of the TMS 2019 Annual Meeting & Exhibition and a new digital component of the publication. Beginning with the January 2019 issue, readers could access a complete, interactive PDF of The Magazine section of JOM online.



For the first time ever, JOM: The Magazine was mailed to TMS members as a standalone, excerpted publication beginning in January 2022. This version contained all of the member news and Society updates that readers enjoyed receiving in print without the heft of The Journal, which remained available exclusively online. Shown here are the first two covers of 2022: on the left, The Magazine cover represents themes from the current issue, and on the right, The Journal's static cover image represents the five TMS technical divisions.



# TMS MEETING HEADLINES

Meeting information is current as of December 19, 2023. For the most recent updates on TMS-sponsored events, visit [www.tms.org/Meetings](http://www.tms.org/Meetings).

## TMS Specialty Congress 2024



June 16–20, 2024  
Cleveland, Ohio,  
USA

**Discount Registration Deadline: April 30, 2024**  
[www.tms.org/SpecialtyCongress2024](http://www.tms.org/SpecialtyCongress2024)

### Featuring:

#### 2nd World Congress on Artificial Intelligence in Materials and Manufacturing (AIM 2024)



Adam Kopper, AIM 2024 Lead Organizer, hopes this congress will “offer insights into how manufacturing operations work, what our challenges are, and where researchers could help manufacturers be successful implementing machine learning into their operations.”

[www.tms.org/AIM2024](http://www.tms.org/AIM2024)

## Digital & Robotic Forming 2024



“Digital and Robotic Forming 2024 is really focused on numerically controlled methods; things like robotics and how they can be applied to forming

techniques, processing science, and the way we manufacture and make materials,” said Tim Rupert, Program Chair on the TMS Board of Directors.

[www.tms.org/RoboticForming2024](http://www.tms.org/RoboticForming2024)

## Accelerating Discovery for Mechanical Behavior of Materials 2024



This conference “will highlight the different techniques and methodologies that research groups are developing to understand these complex mechanisms,” said Aerial D.M. Leonard, Lead Organizer. “It is a unique platform that will promote deep discussions and collaborations across industry, government, and academia.”

[www.tms.org/MechanicalBehavior2024](http://www.tms.org/MechanicalBehavior2024)

## OTHER MEETINGS OF NOTE



### 15th International Symposium on Superalloys (Superalloys 2024)

September 8–12, 2024  
Champion, Pennsylvania, USA

[www.tms.org/Superalloys2024](http://www.tms.org/Superalloys2024)



### TMS Fall Meeting 2024 at Materials Science & Technology (MS&T24)

October 6–9, 2024  
Pittsburgh, Pennsylvania, USA

[www.tms.org/TMSFall2024](http://www.tms.org/TMSFall2024)



### TMS 2025 Annual Meeting & Exhibition (TMS2025)

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

[www.tms.org/TMS2025](http://www.tms.org/TMS2025)



### TMS Specialty Congress 2025

June 15–19, 2025  
Anaheim, California, USA

[www.tms.org/SpecialtyCongress2025](http://www.tms.org/SpecialtyCongress2025)



### Extraction 2025 Meeting & Exhibition (Extraction 2025)

November 16–20, 2025  
Phoenix, Arizona, USA

[www.extractionmeeting.org/Extraction2025](http://www.extractionmeeting.org/Extraction2025)

## CO-SPONSORED MEETINGS

### 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*

# 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](http://www.tms.org/TMSFall2024)





58	<b>Ce</b> Cerium 140.116	59	<b>Pr</b> Praseodymium 140.90765	60	<b>Nd</b> Neodymium 144.242	61	<b>Pm</b> Promethium (145)	62	<b>Sm</b> Samarium 150.36	63	<b>Eu</b> Europium 151.964	64	<b>Gd</b> Gadolinium 157.25	65	<b>Tb</b> Terbium 158.9332	66	<b>Dy</b> Dysprosium 162.5	67	<b>Ho</b> Holmium 164.93032	68	<b>Er</b> Erbium 167.259	69	<b>Tm</b> Thulium 168.93421	70	<b>Yb</b> Ytterbium 173.054	71	<b>Lu</b> Lutetium 174.965
90	<b>Th</b> Thorium 232.03806	91	<b>Pa</b> Protactinium 231.03588	92	<b>U</b> Uranium 238.02891	93	<b>Np</b> Neptunium (237)	94	<b>Pu</b> Plutonium (244)	95	<b>Am</b> Americium (243)	96	<b>Cm</b> Curium (247)	97	<b>Bk</b> Berkelium (247)	98	<b>Cf</b> Californium (251)	99	<b>Es</b> Einsteinium (252)	100	<b>Fm</b> Fermium (257)	101	<b>Md</b> Mendelevium (258)	102	<b>No</b> Nobelium (259)	103	<b>Lr</b> Lawrencium (262)

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