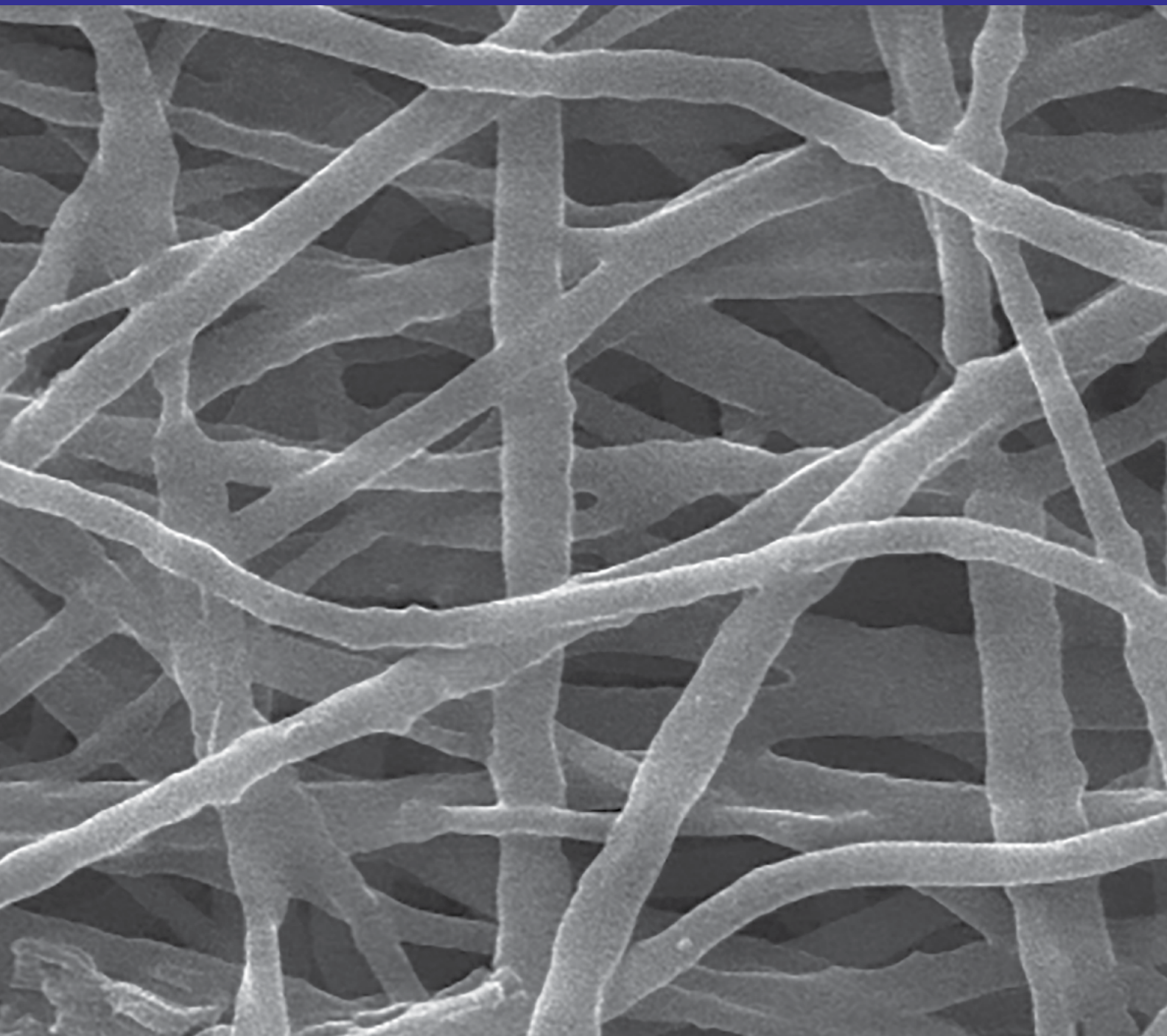


# JOM

DECEMBER 2019

[jom.tms.org](http://jom.tms.org)

An official publication of The Minerals, Metals & Materials Society



**ALREADY A RECORD SETTER: Looking Ahead to TMS2020**

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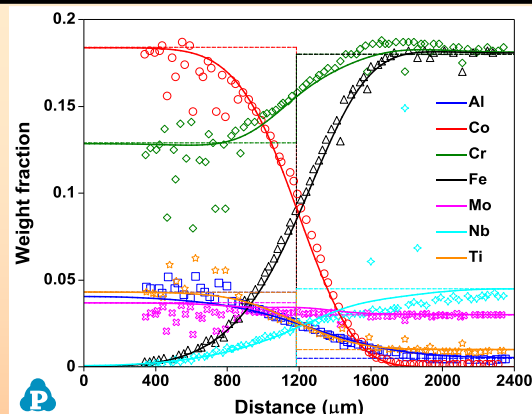
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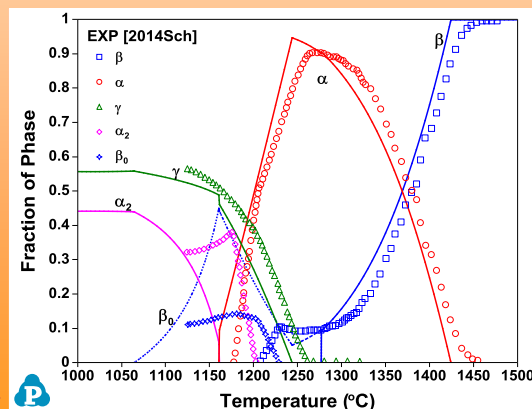
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Diffusion simulation between IN100 and Ni718



Phase fraction as a function of temperature for TNM alloy

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### FOR MORE INFORMATION

For additional information, contact Deborah Hixon, TMS Awards Program Administrator, at [hixon@tms.org](mailto:hixon@tms.org).



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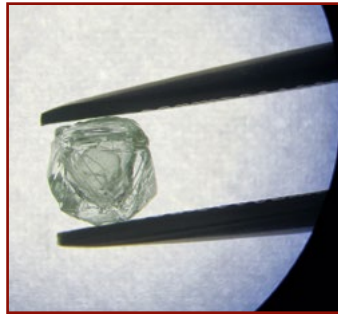
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## About the Cover

A scanning-electron microscopy image from "Electrospun Polyethylene Oxide-Based Membranes Incorporated with Silicon Dioxide, Aluminium Oxide and Clay Nanoparticles as Flexible Solvent-Free Electrolytes for Lithium-Ion Batteries" by Seyedeh Nooshin Banitaba et al. The figure shows electrospun electrolytes containing  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$ , and clay nanoparticles.



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Surface Engineering Committee  
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### Properties of Interfaced Materials and Films: Part II

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A.T. Fiory, New Jersey Institute of Technology  
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# in the final analysis

*"I said there are maybe 100 billion galaxies and 10 billion trillion stars. It's hard to talk about the Cosmos without using big numbers. . . . But I never said 'billions and billions.' For one thing, it's too imprecise."*

— Carl Sagan

In our era of cosmos-sized "big data" challenges and opportunities, headlines spotlight machine learning, computational engineering, informatics, artificial intelligence, 5G networks, data mining, etc., etc. For clarity on what really constitutes big data, I sought expert advice and asked Alexa to define it. "She" told me that "big data" refers to datasets comprising billions or trillions of records. An impressive and Carl-Sagan-sized answer.

While we won't have Alexa on the program, TMS2020 will soon be held in San Diego, California, during February. Big data and new technology will feature strongly at the coming event. It is no trade secret that deep old and new datasets abound in materials and manufacturing. Many of the 85 symposia scheduled at TMS2020 look to be highly infused with the power of massive datasets. How many? Alexa was not able to help with that question (yet), but I took an old-fashioned visual scan through the program for symposium titles that suggest big data underpinnings. By my imprecise count, candidates include Additive Manufacturing; ICME Gap Analysis; Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling; Computational Thermodynamics and Kinetics; Advanced Characterization Techniques for Quantifying and Modeling Deformation; Advanced Real Time Imaging; Characterization: Structural Descriptors, Data-Intensive Techniques, and Uncertainty Quantification; Computational Materials Science and Engineering of Materials in Nuclear Reactors; Computational Discovery and Design of Emerging Materials; ICME Gap Analysis in Materials Informatics: Databases, Machine Learning, and Data-Driven Design.

Just as there is considerable intersectionality between information technology and minerals, metals, and materials technology, a similar outpouring of innovation is occurring in the conference management community. The bold strokes at TMS2020 will not be limited to the content of the technical programming alone but will extend into how the content is presented. I call your attention to two in particular.

The first advance is an evolution of our poster session. For those interested in interaction and impact, the new "Diffusion Zone" will be a must-visit venue. It changes our extensive but long-unchanged poster session format with compelling enhancements. There will still be the traditional pinned-up posters, but we are adding digital posters on monitors, embedded demos, a streamlined poster template, and an app-based rating system. Once attendees experience this exciting session as piloted in San Diego, I anticipate a considerable escalation of participation with the new features at TMS2021 in Orlando.

The second advance is the application of a "silent session" format that has been successfully pioneered by multiple technical societies in recent years. It is a grouping of thematically aligned sessions such that they are held concurrently in a single, open exhibition hall—podia, screens, and audience chairs continue to be grouped together, but the sessions are separated by space, not by walls. Attendees of as many as a dozen concurrent sessions will comele in the great hall and focus their attention on a single speaker among the dozen speakers by using headsets that can be tuned to any podium channel. There is no danger of being crowded out of a session room for a particularly popular talk, there is no lengthy commute between session rooms, there is the ability to sample multiple talks, and there is an assemblage of meeting community on this topic for enhanced networking. It's a bit revolutionary, but also very cool.

As San Diego marks the 149<sup>th</sup> installment of our annual meeting, the event has clearly gone through many, many (albeit not billions of) improvements since it started in 1871 with inkwells and oil lamps. Over the years, the goal is always the same: Meet colleagues, share and comment on progress in science and technology, and serve the good of the order. Plus, every known dataset says that beautiful San Diego is where you want to be in February.

# JOM

Volume 71

Number 12

December 2019



James J. Robinson  
Executive Director

@JJRoTMS

*"Just as there is considerable intersectionality between information technology and minerals, metals, and materials technology, a similar outpouring of innovation is occurring in the conference management community."*



Hani Henein

### member news

*Share the good news about your professional accomplishments! Contact Kaitlin Calva, JOM Magazine Managing Editor, at [kcalva@tms.org](mailto:kcalva@tms.org). Please note that only news submitted by current TMS members will be considered.*

## 2019 AIME President Installed; 2020 TMS Meeting of the Membership Slated

### Hani Henein Begins Term as 2019 AIME President

Hani Henein, professor and director of the Advanced Materials and Processing Laboratory, University of Alberta, was installed as the 2019 President of the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME) in August. Among many his many honors and professional contributions, Henein served as TMS

President in 2014.

TMS is one of four member societies of AIME, which provides support to these member societies in the form of awards, scholarships, and special grants. Founded in 1871, AIME is also considered one of the five founder societies of engineering and is the antecedent society of TMS.

### Announcing the 2020 TMS Meeting of the Membership and Open Board of Directors Meeting

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 2020 Annual Meeting of the Membership with open Board of Directors Meeting, on Thursday,

February 27, 2020, at 8 a.m. (PT) in the Newport Beach Room (South Tower, Level 4) at the Marriott Marquis San Diego Marina, during the TMS 2020 Annual Meeting & Exhibition. All TMS members are welcome to attend.

### TMS Welcomes New Members

**The TMS Board of Directors approved professional membership for the following individuals at its October 2019 meeting. Please join us in congratulating and welcoming them to all the privileges and benefits of TMS membership.**

Aguiar, Jeffery, A.; Idaho National Laboratory, United States

Alves, Fabio; Brazil

Amer, Adel Mohamed; Suez University, Egypt

Anderson, David; Novelis Inc., United States

Aoyagi, Yoshiteru; Tohoku University, Japan

Arkush, Rami; Nuclear Research Center Negev, Israel

Asano, Masamichi; Mitsubishi Heavy Industries America, United States

Attah-Kyei, Desmond; Aalto University, Finland

Balachandran Nair, Shanoob; Max-Planck Institute for Iron Research, Germany

Bement, Matthew; Los Alamos National Laboratory, United States

Bolton, Jonathan Martin; United Kingdom

Borgenstam, Annika; KTH Royal Institute of Technology, Sweden

Briffod, Fabien; University of Tokyo, Japan

Campbell, Colin D.; California Polytechnic State University, United States

Caradec, Pierre; Villares Metals, Brazil

Carstensen, Rowan Leonard; United Kingdom

Chakraborty, Kalyan Kumar; India

Chan, Yiu Chang Anthony; Hong Kong

Chikkam, Anil Kumar; Matergenics Inc., United States

Chintalapati, Pavan; Garrett Motion Engineering Solutions, India	Hightower, Adrian; Metropolitan Water District of Southern California, United States	Leaske, Erik; Kaiser Aluminum, United States
Clayton, Kate Leanne; United Kingdom	Hinchliffe, Thomas Connor; United Kingdom	Lei, Shu Chiang; NAVAIR, United States
Crane, Cortney; Exponent, United States	Ho, Cheng-En; Yuan Ze University, Taiwan	Li, Weidong; Goodyear Tire & Rubber Company, United States
Croom, Brendan P.; United States	Hoerner, Michael James; KnightHawk Engineering Inc., United States	Liaqat, Usman; NUST Islamabad, Pakistan
Daryadel, Soheil; University of Illinois at Urbana-Champaign, United States	Hsieh, Ker-Chang; Taiwan	Lopes de Castro, Mario Augusto; Brazil
De Beer, Johannes; United Kingdom	Hu, Jun; AK Steel, United States	Maiti, Soumyadipta; TCS Research TRDDC, India
DeGreeff, Jenni; New Mexico Gas Co., United States	Huang, T.D.; Huntington Ingalls Industries, United States	Martinez Alvarez, Juan Manuel; ArcelorMittal en Espana, Spain
Dutta, Jayita; TCS Research, India	Huddle, Curtis; Eastman Chemical Company, United States	Mathieson, Denise Melanie; United Kingdom
Egusa, Daisuke; The University of Tokyo, Japan	Hultman, Paul D.; Century Sun Metal Treating, United States	Mies, Deborah E.; Granta Design, United Kingdom
Epler, Mario E.; Carpenter Technology Corp., United States	Inomoto, Masahiro; Kobe Steel, Japan	Mohapatra, Goutam; John Deere India, India
Farina, Alexandre B.; Villares Metals, Brazil	Inoue, Tetsuo; Japan Science and Technology Agency, Japan	Mushongera, Leslie Tafadzwa; Karlsruhe University of Applied Science, United States
Farmer, Kyle S.; Honeywell, United States	Islamov, Eldaniz; Azerbaijan	Nagarajan, Srinivasan; Indian Institute of Technology Kanpur, India
Feng, Jie; University of Illinois at Urbana-Champaign, United States	Jadhav, Prashant Shriram; University of Birmingham, United Kingdom	Nasri, Meysam; DNVGL, United States
Frazier, William E.; Pacific Northwest National Laboratory, United States	Jiang, Jun; Beijing Computing Center, China	Nettikaden, Varghese Chakko; New Zealand
Gady, Ryan; Carl Zeiss Microscopy, United States	Joseph, Ceena; GKN Aerospace AB, Sweden	Newton, Chris J.; Bridon Bekaert The Ropes Group, United Kingdom
Galan, Jesus; Delft University of Technology, Netherlands	Kells, Adam William Robert; United Kingdom	Nicol, Stuart Leslie; Gopher Resource, United States
Glavicic, Michael George; Rolls-Royce, United States	Kelsey, Mark; Bruker Nano Inc., United States	Okumura, Ryota; DENSO International America Inc., United States
Greenhalgh, Emile Smith; United Kingdom	Kessler, Brian S.; Colorado Mesa University, United States	Oldroyd, Christopher James; United Kingdom
Hao, Xinjiang; United Kingdom	Kizawa, Katsuhiko; JTEKT North America, United States	Ozisik, Rahmi; Rensselaer Polytechnic Institute, United States
Hartwig, Charles; ThermTech, United States	Knizhnik, Aleksei V.; JSC SibVAMI, Russian Federation	Panourgias, George; LIFT, United States
Hawkins, Michael; United Kingdom	Kogo, Bridget; United Kingdom	Panwisawas, Chinnapat; University of Oxford, United Kingdom
He, Bo; Shanghai University of Engineering Science, China	Laschet, Gottfried; Access e.V., Germany	
Hehn, Lucien; NOV-Grant Prideco, United States	Laursen, Christopher M.; Sandia National Laboratories, United States	
	Law, Stephanie; University of Delaware, United States	

Perezselsky, Genaro A.; Element, United States	Selleby, Malin; KTH Royal Institute of Technology, Sweden	Tritapoe, Nicholas; Dominion Energy, United States
Peter, Gerald Tennyson; Tata Consultancy Services Limited, India	Shah, Kinnari; United States	Trivedi, Jignesh Balkrishna; United Kingdom
Petrie, William Scott; United Kingdom	Shah, Megna; Air Force Research Laboratory, United States	Uratani, Masato; IHI, Japan
Pham, Jonathan; University of Kentucky, United States	Shrimpton, Geoff; AWE PLC, United Kingdom	Uria Alvarez, Alejandro Jose; Arcelor Mittal, Spain
Pidaparti, Ramana; University of Georgia, United States	Sikora-Jasinska, Malgorzata; Michigan Technological University, United States	van den Bogert, Kevin; American River College, United States
Qian, Quan; Shanghai University, China	Singo, Nthambeleni Beaurothy; United Kingdom	Vickers, Paul Michael; United Kingdom
Rainey, Kelsey D.; United States	Solomon, Ellen; Engineering Systems Inc., United States	Wang, Caiqun; Beijing Computing Center, China
Ramirez, Ainissa G.; United States	Sorrell, Jessica; United Kingdom	Wang, Donghong; Shanghai Jiao Tong University, China
Rastegar, Vahid; HC Starck, United States	Southall, David James; United States	Wang, Leyun; Shanghai Jiao Tong University, China
Record, Howard; Townley Foundry & Machine, United States	Stoerzinger, Kelsey A.; Oregon State University, United States	Wang, Xiao Xu; China
Richey, Edward; Praxair, United States	Stout, Stephen A.; Lawrence Livermore National Laboratory, United States	Weerawardena, Chirantha Indrajith; Australia
Rodriguez, Rogie I.; Boeing, United States	Su, Xuming; Ford Motor Company, United States	Whittaker, Dale Anthony; United Kingdom
Rudelson, Grisha; Israel	Sugiyama, Kenji; Japan	Wood, Amanda J.; Thermo-Calc Software AB, Sweden
Sadayappan, Kumar; CanmetMATERIALS, Canada	Sullivan, MariAnne; Exponent, United States	Yamazaki, Toshihiro; ITOCHU Techno-Solutions, Japan
Santerre, Renaud; Retired from Rio Tinto Alcan, Canada	Swindells, Norman; Ferroday Ltd., United Kingdom	Yan, Luchun; University of Science and Technology Beijing, China
Satsangi, Sahabsaran; United Kingdom	Tabei, Ali; United States	Yang, Lixia; China Iron and Steel Research Institute, China
Schaffer, Graham B.; University of Melbourne, Australia	Tahanpesarandezfuly, Nader; Iran Open University, Iran	Yang, Xiaoyu; Chinese Academy of Sciences, China
Schenk, Bjoern; Garrett, Switzerland	Tewary, Ujjal; John Deere India Pvt. Ltd., India	Yang, Yu-Ping; Ingalls, United States
Scholler, Steven; Huntington Ingalls Industries, United States	Tippey, Kristin; Evraz NA, United States	Zhang, Yiming; Chinese Academy of Sciences, China
Scunda, Andrea; United Kingdom	Tran, Anh; Sandia National Laboratories, United States	Zhao, Lei; China Iron and Steel Research Institute Group, China



Do you have business or industry news of interest to the minerals, metals, and materials community? Submit your announcement or press release to Kaitlin Calva, JOM Magazine Managing Editor, at [kcalva@tms.org](mailto:kcalva@tms.org) for consideration.

## In Case You Missed It: Business News from the Field

### Discovery May Prevent Cracked Smartphone Screens

**Troy, New York:** Rensselaer Polytechnic Institute researchers have discovered how to minimize the breakability of silica glass, which is used for mobile device screens. Through molecular dynamics simulations which are generally consistent with experimental observations, they found that glass produced by consolidating silica nanoparticles under pressure can be stretched up to 100 percent. During processing, the compression changes the material structure to become five-fold silicon, where five oxygen atoms bond with the silicon instead of the typical four, and enhanced ductility occurs as a result.

### Kyocera Acquires German-based Advanced Ceramic Business

**Kyoto, Japan:** Kyocera Corporation's German-based European headquarters, Kyocera Fineceramics GmbH, completed the acquisition of the advanced ceramics business from Friatec, a manufacturer and seller of ceramic and plastic components based in Mannheim, Germany. The acquisition gives Kyocera its second fine ceramic manufacturing facility in Europe and positions the corporation to meet the rising demand for fine ceramic components used in industrial machinery.

### Fab AE Prints Medical Necessities in Deployment Zone

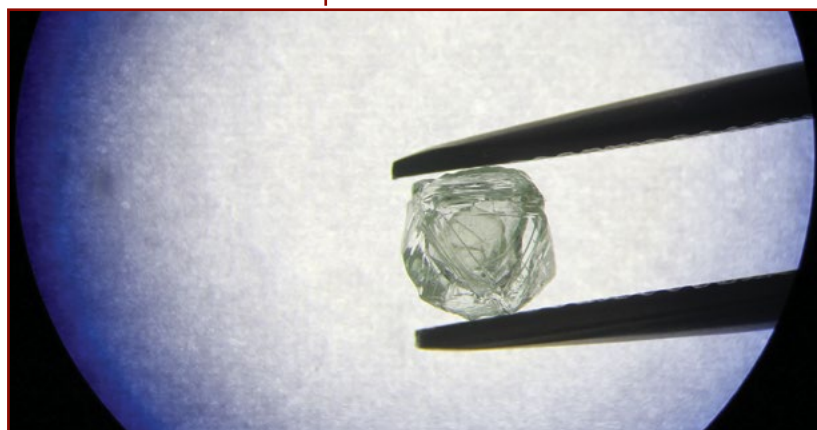
**Bethesda, Maryland:** A pilot program, called Fabrication in Austere Environments, or Fab AE, has shown a 3D printer capable of biofabrication could expedite medical treatments for troops in harsh environments. From an undisclosed desert location, the printer successfully fabricated knee cartilage and several medical supplies, including surgical tools made of material that could be sterilized on site, antibiotic bandages, and a surgical model of a vertebrae. This initiative was a collaborative effort between the Uniformed Services University of the Health Sciences, U.S. Military Academy at West Point, and The Geneva Foundation, along with Script and Techshot.

### MOL and Thyssenkrupp Begin Construction of Polyol Plant

**Tiszaújváros, Hungary:** Thyssenkrupp broke ground in September for a new polyol plant in Tiszaújváros, Hungary. The MOL Group is investing \$1.3 billion in the complex that is expected to be commissioned in 2021 and will produce 200,000 tons of polyols annually. Polyol is a plastic raw material used in numerous industries, from automotive manufacturing to construction to the clothing industry. The new Tiszaújváros complex will produce polyether polyols using efficient and environmentally friendly technologies such as the propylene oxide from hydrogen peroxide process (HPPO) developed by Thyssenkrupp and Evonik.

### Neste's Aviation Fuel Makes Lufthansa Flights Greener

**Espoo, Finland:** Neste, a leading renewable fuel producer, will provide sustainable aviation fuel to the European airline Lufthansa. Lufthansa will use the green product blended with fossil jet fuel for flights departing from Frankfurt. Delivery of the fuel to Lufthansa began earlier this year. This agreement strengthens a collaboration started in 2011 between the two companies when Lufthansa tested Neste's sustainable aviation fuel on 1,187 flights between Frankfurt and Hamburg.



**Yakutsk, Russia:** Alrosa unearthed a rare gem described as a diamond within a diamond from its mine at the Nyurba Mining and Processing Division. The company's R&D division determined the internal diamond formed first and experienced a second stage of growth that formed the exterior diamond. The gem is called Matryoshka, named after Russian nesting dolls.

# ALREADY A RECORD SETTER: Previewing the TMS 2020 Annual Meeting & Exhibition

Kelly Zappas

**TMS**2020  
149<sup>th</sup> Annual Meeting & Exhibition

## POP QUIZ:

What was the location of the best-attended TMS Annual Meeting in the Society's history?

## ANSWER:

San Diego, California. The year was 2017, and the city welcomed 4,642 scientists, engineers, and students from around the world for the TMS 2017 Annual Meeting & Exhibition.



The TMS 2020 Annual Meeting & Exhibition (TMS2020) will be returning to San Diego, February 23–27, and already this meeting is setting its own records. With 4,950 abstracts submitted at last count—compared to 4,913 in 2017—TMS2020 officially holds the record for most abstracts submitted to a TMS Annual Meeting.

While this isn't the final number of presentations that will be held at the meeting in February (this number doesn't account for presentations that are not accepted or are cancelled)—it does indicate a growing conference that is attracting minerals, metals, and materials scientists, engineers, and students from around the world.

At TMS2020, papers will be presented at more than 85 symposia in 15 topic areas: Additive Technologies, Materials Processing, Mechanics & Structural Reliability, Corrosion, Nuclear Materials, Physical Metallurgy, Light Metals, Characterization, Nanostructured and Heterostructured Materials, Advanced Materials, Electronic Materials, Energy & Environment, Biomaterials, Materials Design, and Special Topics.

In addition to this core technical program, the meeting will include keynote sessions featuring invited speakers, special lectures from award recipients, invited luncheon lecturers, and an all-conference plenary speaker, as well as social and networking events.

While this article offers a glimpse of what's planned for TMS2020, please visit the conference website, [www.tms.org/TMS2020](http://www.tms.org/TMS2020), for the most up-to-date information on featured presentations, special events, and preliminary technical program information.

## MEET THE ALL-CONFERENCE PLENARY SPEAKER:



**John Mason**, Director of Gas Turbine Products Engineering at Solar Turbines Incorporated, will deliver the TMS2020 All-Conference Plenary presentation on

Monday, February 24. Mason's talk, "Leveraging Materials Innovation to Drive Industrial Gas Turbine Performance and Secure a Sustainable Future," will look at the increasing importance of industrial gas turbine engines in today's energy landscape. He will discuss improvements in gas turbine engine performance that have been enhanced by an array of materials and processing advances. His talk will also look at how materials engineering innovations, such as Integrated Computational Materials Engineering, high-entropy alloys, and additive manufacturing, are driving progress in gas turbine technology development, application, and time-to-market.

"These advancements, championed by a new generation of materials scientists and engineers, will further enhance and expand the performance and application of industrial gas turbine technology," Mason writes in his abstract.

## PbZn 2020 COMES TO TMS2020



The 9th International Symposium on Lead and Zinc Processing (PbZn 2020) will be co-located with TMS2020, giving attendees access to the technical programs of both events for a single

registration fee. Established in 1970, the PbZn symposium series is considered the leading international technical forum for the lead and zinc processing industries.

In addition to more than 100 planned technical presentations over the course of the week, PbZn 2020 will feature two special events.



On Monday evening, February 24, the PbZn 2020 networking event, **PuBZoNe**, will offer attendees the opportunity to connect in a relaxed, causal setting at a local San Diego restaurant. Drink tickets and light appetizers will be provided; attendees can purchase

tickets for this event through the TMS2020 registration form.

On Tuesday afternoon, Markus Reuter, Helmholtz Institute Freiberg for Resource Technology, will deliver the **Extraction & Processing Division/Materials Processing & Manufacturing Division/PbZn2020 Luncheon Lecture**. (See "Luncheon Lectures" in this article for details.)

PbZn 2020 is organized by TMS, with sponsorship from the Hydrometallurgy and Electrometallurgy Committee and the Pyrometallurgy Committee. The Metallurgy & Materials Society of the Canadian Institute of Mining, Metallurgy and Petroleum; Gesellschaft der Metallurgen und Bergleute; and The Mining and Materials Processing Institute of Japan are co-organizers of the event, and the Nonferrous Metals Society of China is a co-sponsor.

## ELECTROMETALLURGY 2020 JOINS TMS2020

The 3rd International Symposium on Electrometallurgy will also be held at TMS2020, bringing together industry, consulting engineers, and researchers to discuss fundamental research, development, and application of innovative aqueous or molten salt electrometallurgical processing technologies for the extraction of metals. The previous two symposia were held in Orlando in 2012 and Quebec City in 2016.

A highlight of this year's event will be **Sadoway 70**, an honorary symposium dedicated to the innovative contributions of Donald Sadoway, Massachusetts Institute of Technology (MIT). Formally titled **Process Metallurgy and Electrochemistry of Molten Salts, Liquid Metal Batteries, and Extra-terrestrial Materials Processing: An EPD Symposium in Honor of Don Sadoway**, this

symposium will feature a line-up of invited speakers, and topics will encompass process metallurgy and electrochemistry of molten salts, liquid metal batteries, and extra-terrestrial materials processing.

Electrometallurgy 2020 is organized by TMS and the Metallurgy and Materials Society (MetSoc) of the Canadian Institute of Mining, Metallurgy, and Petroleum (CIM), with leadership from the TMS Extraction & Processing Division and support from the Hydrometallurgy and Electrometallurgy, Process Modeling and Technology, and Pyrometallurgy committees of TMS.

## INTRODUCING THE DIFFUSION ZONE AND SILENT SESSIONS

Attendees can experience a new way of networking and sharing ideas at the TMS Annual Meeting, using digital technologies and innovative presentation approaches that will be piloted at TMS2020.

First up is the **Diffusion Zone**, which is the new name for the poster session held at TMS Annual Meetings. The concept is to create diffuse networking and engagement opportunities for poster session presenters and other meeting attendees through the addition of new elements that blend traditional, digital, and other approaches. In addition to traditional posters, the Diffusion Zone will feature digital posters displayed on monitors, embedded demos, and the use of a streamlined poster template. Attendees will even be able to provide feedback on posters through an app-based rating system.

Attendees will also be able to sample multiple sessions in a single location using "**silent session**" headset technology. Here's how it will work: several speakers will be set up in one large presentation space. Each speaker will stand behind a podium and deliver a slide presentation as usual, but attendees will listen to the presentation through a set of headphones. This approach allows several related sessions to be held concurrently in the same room, making it easier for attendees to sample different presentations and session hop without leaving the room.

TMS is piloting this approach with select symposia at the 2020 meeting, but all are welcome to attend and provide feedback on how we can use silent sessions to make your Annual Meeting experience more productive and easier to navigate in the future.

## HONORARY SYMPOSIA AT TMS2020



In addition to the Sadoway 70 symposium at Electrometallurgy 2020, TMS will honor several prominent members at three additional honorary symposia during TMS2020.

**Innovations in High Entropy Alloys and Bulk Metallic Glasses: A Structural Materials Division & Functional Materials Division Symposium in Honor of Peter K. Liaw** will honor Liaw, professor at the University of Tennessee, Knoxville, for his significant contributions to materials science and engineering and TMS. Sessions will emphasize processing, microstructures, and mechanical behavior of bulk metallic glasses, high-entropy alloys, and other areas in which Liaw has made contributions.

**Progress towards Understanding the Synthesis and Behavior of Metals Far from Equilibrium: A Structural Materials Division Symposium Honoring Enrique Lavernia on the Occasion of His 60th Birthday** will honor Lavernia, provost and executive vice chancellor for the University of California, Irvine, for his outstanding contributions to materials science for more than 30 years. Lavernia has made seminal contributions to the synthesis and behavior of nanostructured and multi-scale materials with particular emphasis on processing fundamentals and physical behavior, thermal spray processing of nanostructured materials, spray atomization and deposition of structural materials, high temperature-high pressure atomization processes, and additive manufacturing of metals.

**Purveyors of Processing Science and Integrated Computational Materials Engineering: A Structural Materials Division Symposium to Honor the Many Contributions of Taylan Altan, Wei Tsu Wu, Soo-Ik Oh, and Lee Semiatin** will recognize the contributions of a small group of scientists and engineers who came together at Battelle Memorial Institute in the late 1970s to work on a wide range of metals processing techniques. The symposium's central themes will be processing, process simulation, and modeling the evolution of microstructure/texture/defects during processing. Invited speakers from academia and government labs will highlight the honorees' technical breadth and depth while those from industry will highlight the impact of their work in a production environment.

## NEW SPOTLIGHT LUNCHEON PLANNED



Glenn Daehn

The new **Materials and Manufacturing Innovation Spotlight Luncheon**, planned for Thursday afternoon, February 27, will feature presentations by three speakers, including Glenn Daehn of The Ohio State University. Daehn was the team lead for the March 2019 study, *Metamorphic Manufacturing: Shaping the Future of On-Demand Components*,

organized by TMS on behalf of the Office of Naval Research and the Lightweight Innovations for Tomorrow Manufacturing Institute. Registrants can purchase a boxed lunch through the registration form, but anyone can attend the lectures at no cost.

## LIGHT METALS KEYNOTE SESSION PLANNED



Attracting and Growing the Next Generation of Technical Talent for the Light Metals Industry will be the topic of the Light Metals Keynote session at TMS2020. This annual event, which kicks off Light Metals programming at the annual meeting, will feature global perspectives on the topic from **Margaret Hyland**, Vice Provost Research, Victoria University of Wellington, New Zealand; **Alan A. Luo**, The Ohio State University, USA; **Robert B. Wagstaff**, Chief Scientist and Senior Fellow, Novelis Inc., USA; **Nina Dahl**, Research Director, Metal Production and Processing, SINTEF Industry, Norway; and **Joe Lombard**, Global Managing Director: Metals, Mining & Minerals, Hatch, Canada. The session will conclude with a panel discussion.

For the most up-to-date information on keynote plans, visit the Featured Sessions section of the TMS2020 website.

## LUNCHEON LECTURES AT TMS2020

Throughout the week at TMS2020, the Society's technical divisions will hold luncheon events that offer division members an opportunity to network, honor outstanding members, and hear from an invited speaker selected by the division leadership. Anyone can listen to the lecture portions of these events, but tickets are required to receive a lunch. Tickets can be purchased for \$40 each through the TMS2020 registration form.



**Ricardo Lebensohn** of Los Alamos National Laboratory will headline the Structural Materials Division Luncheon on Monday, February 24, with the presentation, "How Modelers Are Keeping up with Emerging Materials Characterization and Data Analytics Techniques." In this talk, Lebensohn will introduce recent advances coming out of the

mechanics of materials community for the analysis of the micromechanical response and microstructure evolution of polycrystalline materials in three dimensions.



**Markus Reuter** of the Helmholtz Institute Freiberg for Resource Technology will deliver the talk "Process Metallurgy as a Key Enabler of the Circular Economy: Digital Twinning of the Resource and Processing System" at the Extraction & Processing Division/Materials Processing & Manufacturing Division/PbZn2020 Luncheon on

Tuesday, February 25. Reuter's research and industrial interests include process metallurgy, system engineering, process design, optimization and simulation, recycling and design for recycling—all in the context of sustainability and the circular economy paradigm.



**Mark Easton** of RMIT University will be the featured speaker at the Light Metals Division Luncheon on Wednesday, February 26, discussing "Near Net Manufacturing of Light Metal Alloys." Easton has more than 20 years of experience in solidification processing of light alloys, initially focusing on casting. This talk will

highlight the development of near net shape manufacturing of light metal alloys.

## AWARD LECTURES

The following award recipients will be honored with featured lectures at TMS2020:



**Phillip Mackey**, P.J. Mackey Technologies Inc., will deliver the Extraction & Processing Division Distinguished Lecture, "Around the Lead and Zinc Metallurgical World in Eighty Days: A Virtual Tour of World Lead and Zinc Operations and Technologies."



**Ursula R. Kattner**, National Institute of Standards and Technology, will deliver the William Hume-Rothery Award Lecture, "Phase Diagrams, Computational Thermodynamics and CALPHAD."



**Yuntian Zhu**, North Carolina State University, will deliver the Institute of Metals/Robert Franklin Mehl Award Lecture, "Heterostructured Materials: A New Paradigm for Designing Metals with Superior Mechanical Properties."



**Robert O. Ritchie**, H.T. & Jessie Chua Distinguished Professor of Engineering in the Departments of Materials Science & Engineering and Mechanical Engineering at the University of California in Berkeley, will be the inaugural William D. Nix Award Lecturer at TMS2020.



**Douglas Hofmann**, principal at NASA's Jet Propulsion Laboratory, will deliver the first Young Innovator in the Materials Science of Additive Manufacturing Award Lecture, "Innovation in Additive Manufacturing: A Perspective on an Early Career in Metal Alloy Development." His presentation will be part of the TMS2020 Additive Manufacturing keynote session.

For information about dates and locations for these award lectures, visit the Events section of [www.tms.org/TMS2020](http://www.tms.org/TMS2020).

## MAKE YOUR TRAVEL PLANS TODAY

Registration is now open for TMS2020. When you register for the conference, you can reserve your place at workshops, courses, luncheons, and networking events. (If you've already registered, you can log back in to the registration website at any time to add an event.) To receive the discounted advance registration rate, you must register by **January 17, 2020**. Through [www.tms.org/TMS2020](http://www.tms.org/TMS2020), you can also:

**BOOK HOUSING:** A limited number of rooms have been reserved for TMS2020 attendees at discounted rates at the Marriott Marquis San Diego Marina, which will act as the TMS headquarters hotel and will be the site of many of the event's social activities and committee meetings. Secure a convenient and affordable room by booking through TMS's official housing provider OnPeak at the TMS2020 Housing web page.

**APPLY FOR FAMILY CARE GRANTS:** If you will incur additional childcare or other family care costs as a result of attending TMS2020, you can apply for a TMS Family Care Grant, which provides a limited number of grants to help offset these expenses. Available on a first-come, first-served basis.

Information on short courses and workshops, keynote sessions, networking events, and other activities are regularly being added to [www.tms.org/TMS2020](http://www.tms.org/TMS2020), so check the website frequently for updates. We look forward to seeing you in San Diego in February!

## IN THE EXHIBIT HALL



The TMS2020 Exhibit Hall, open Monday, February 24, through Wednesday, February 26, will be the setting for several major social and networking events at the conference, giving attendees ample opportunity to explore exhibitors' products and services while connecting with fellow attendees.

The exhibit hall will host two receptions: the Exhibit Opening Reception and Poster Session on Monday evening and the Exhibit Hall Happy Hour and Poster Session on Tuesday evening. Both events will feature appetizers, beverages, and networking opportunities. Also, on Monday, Tuesday, and Wednesday afternoon, lunch will be served in the exhibit hall for all full-conference attendees.

Find out which companies will be featured at the exhibit and view an interactive floor plan at [www.tms.org/TMS2020Exhibit](http://www.tms.org/TMS2020Exhibit). Spaces are still available for exhibiting companies. Contact Gavin McAuliffe, TMS2020 Exhibit Manager at Corcoran Expositions, at [gavin@corcexpo.com](mailto:gavin@corcexpo.com). Sponsorship opportunities are also available. Contact Mary Michalik, TMS2020 Sponsorship Manager at Corcoran Expositions, at [mary@corcexpo.com](mailto:mary@corcexpo.com) or visit [www.tms.org/TMS2020Sponsor](http://www.tms.org/TMS2020Sponsor) to learn more.

## TMS2020 PROCEEDINGS



TMS2020 attendees in most registration classes will receive free online access to the complete collection of proceedings publications. The following volumes will be included in this online proceedings content, and hard copies will be available for purchase at TMS2020:

- *11th International Symposium on High-Temperature Metallurgical Processing*
- *Advances in Powder and Ceramic Materials Science*
- *Characterization of Minerals, Metals, and Materials 2020*
- *Energy Technology 2020: Recycling, Carbon Dioxide Management, and Other Technologies*
- *Light Metals 2020*
- *Magnesium Technology 2020*
- *Materials Processing Fundamentals 2020*
- *Nanocomposites VI: Nanoscience and Nanotechnology in Advanced Composites*
- *Rare Metal Technology 2020*
- *PbZn 2020: The 9th International Symposium on Lead and Zinc Processing*
- *TMS2020 Supplemental Proceedings*

Approximately one week prior to the meeting, preregistered attendees will receive information on how to access proceedings content.



# Giving Back Through Service: Incoming TMS Board Members Discuss Their New Roles

Kelly Zappas

When the incoming members of the TMS Board of Directors were asked about their motivations for joining TMS leadership, one reason popped up time and again: to give back. In 2020, TMS welcomes seven individuals to its Board of Directors, each of whom has benefitted from TMS membership in the past and is now looking to give back to the Society and their profession.

At the TMS 2020 Annual Meeting & Exhibition

(TMS2020) in San Diego, California, in February, these new Board members will begin their terms, so take a few moments today to meet these active TMS volunteers, to learn how TMS has influenced their careers, and to gain insight into what they hope to accomplish during their time in office.

Who knows? You may even be inspired to volunteer with TMS yourself.



**Ellen Cerreta,  
Vice President**

“I have been a TMS member since 1997, when I joined as a graduate student and attended my first meeting,” said Ellen Cerreta, who is deputy division leader for the Explosive Science and Shock Physics Division at Los Alamos National Laboratory. “I did not know it then, but TMS would become an

important part of both my academic and professional life.”

Access to strong and diverse mentorship has been an important part of Cerreta’s career development, from receiving peer review at her first TMS talk to being encouraged to apply for leadership positions.

“TMS membership gave me important access to such mentorship, and, at least early on in my career, this was why I was a member of the Society,” said Cerreta. “In the years that followed, that mentorship experience created a strong desire to provide those same opportunities to others.”

Her relationship with TMS has grown along with her career. As a student, she met her future post-doctoral mentor at a TMS Fall Meeting in St. Louis and was offered a position at Los Alamos. As an early career scientist, she

built strong international collaborations through the TMS International Scholar Program, conducted in partnership with the Japan Institute of Metals and Materials. Most recently, she has been able to observe different leadership styles as a member of the TMS Board of Directors.

Cerreta will begin the three-year TMS Presidential Rotation when she is installed as the Society’s Vice President at TMS2020. She will lead the TMS Board of Directors as the 2021 TMS President and then move into the role of Past President in 2022.

“As I reflect on what TMS has given to me, I know it is time to give back,” said Cerreta, who says she is most excited about helping to implement the strategic planning conducted by the Board in 2018, which focuses on volunteer-driven programming, robust annual meetings, a diverse and inclusive membership, and strong partnerships between basic and applied sciences and technologies, while also embracing change and working to further improve the TMS experience.

“The core TMS values have made us a Society that offers important benefits to its members like mentoring, peer review, networking, and collaborations,” said Cerreta. “The world changes around us, but, through careful attention to the strategy, I believe we can enhance the TMS experience, inspire new generations of loyal members, and support our thought leaders as they scope the future of materials engineering and technology.”



**Charles Ward,  
Financial Planning  
Officer**

Charles Ward says that his initial interactions with TMS came through attending the Society's annual conferences and presenting his research.

"I've stayed engaged because of the power the Society has to bring people together to share relevant experiences, and

in so doing grow the entire materials community," said Ward, who is chief of the Manufacturing and Industrial Technologies Division at the U.S. Air Force Research Laboratory's Materials and Manufacturing Directorate.

Over the years, Ward has participated in a number of TMS volunteer roles, including editor-in-chief of

the journal *Integrating Materials and Manufacturing Innovation*, chair of the TMS Materials Innovation Committee, and TMS representative to ABET's Engineering Accreditation Commission.

He sees his new position, as TMS Financial Planning Officer, as a natural progression from his other roles in TMS, starting with technical committee participation and up through membership on the Society's Financial Planning Committee.

"I felt I had accumulated enough experience across TMS to be able to give back to the society in a substantive way," he said.

In Ward's view, being introduced to new ideas and people from across the globe has been the greatest benefit of his TMS involvement. "Both have shaped the way I approach my work by providing me with new insights and potential partners to tackle challenging problems."



**Judy Schneider,  
Content Development &  
Dissemination Director**

"I do not think I could have navigated the academic ranks without the guidance and mentoring of my TMS colleagues," said Judy Schneider, professor in the Department of Mechanical and Aerospace Engineering at the University of Alabama in Huntsville.

Schneider first became active in TMS when she started her academic career in 2000.

"Overall, I found TMS to be a very active and vibrant technical society," she said. "TMS members are very helpful and well connected to current issues. Being a member of TMS for almost two decades, I now look forward to working with new members and helping them navigate their careers."

Schneider found tremendous value in the scholarly

collegiality of TMS members, and through her interactions with other members, she rapidly became involved with organizing symposia and taking leadership roles on several committees. She continues to regularly chair sessions at TMS Annual Meetings and Materials Science & Technology conferences and now helps new faculty members contribute by getting them involved with organizing symposia.

Of her new position as Content Development & Dissemination Director on the TMS Board, Schneider said, "I feel this position is a culmination of my publishing activities as both a scholar and a member of TMS." Schneider has served as a *JOM* advisor, which helped her to understand the publication side of TMS and prepared her for service on the Content Development & Dissemination Committee. She has been a member of the committee since 2011 and served as vice chair in 2016.

In this new role, she looks forward to working on capturing content at TMS annual meetings, promoting student involvement, and exploring open access options.



**David L. Bourell,  
Professional  
Development Director**

"TMS has provided great opportunities to engage technically through the fall and annual meetings," said David Bourell, who first joined TMS while he was in graduate school, more than 40 years ago. "I've gotten great ideas for research directions

based on my participation."

In his time with the Society, Bourell, who is the Temple Foundation Professor of Mechanical Engineering

at The University of Texas at Austin, has helped to expand the technologies covered by TMS. He served as the founding chair of the TMS Additive Manufacturing Committee, which is TMS's first technical committee to span all five of the Society's technical divisions. "I enjoyed very much helping getting additive manufacturing structured within the society."

Representing Professional Development on the Board, Bourell says he plans to continue the great service TMS does in professional engineering registration, ABET, and education.

"I have received so much from TMS," said Bourell. "I hope by service on the Board to give back to the Society and to enable others to contribute to Society activities."



**Eric N. Brown,  
Public & Governmental  
Affairs Director**

“Every time I have had an opportunity to serve within TMS, I have always gotten more out of the experience than I put into it,” said Eric Brown, who is the division leader for the Explosive Science and Shock Physics Division at Los Alamos National Laboratory.

Brown’s first involvement with TMS was as a postdoc at Los Alamos. “My mentor encouraged me to submit an abstract and attend the annual conference, and it immediately became clear to me that TMS would be a significant forum in which to present my research, as well as a community that would be highly influential in my career going forward. The quality of science presented has always kept me engaged, but so has the opportunity to be of service.”

Early on, he became involved with the TMS Young

Leaders and the Structural Materials Division, which lead to roles on various committees.

“The bottom up nature of the society allows everyone to get involved,” he said. “All you have to do is step forward and offer to help with something. I encourage everyone to check out [volunteer.tms.org](http://volunteer.tms.org) to find the right opportunity for you.”

In his new role as director of Public & Governmental Affairs, Brown sees an opportunity to directly and indirectly impact the advancement of materials science within and beyond TMS.

“I think this is a very exciting time for TMS and the broader scientific community,” he said. “I am particularly interested in how the committee and TMS can expand its impact on the public. TMS has developed a series of outstanding tools to support educators to teach about Materials Science and Engineering, which is having a great impact. Materials have such a massive impact on our quality of life, through enabling safer cars, more efficient energy generation, and faster electronics. We seek to enter the next phase of Materials Innovation and look for other opportunities to engage with the broader community.”



**Christina Meskers,  
Extraction &  
Processing Division  
Chair**

Christina Meskers began her relationship with TMS when her Ph.D. supervisor brought her to a TMS Annual Meeting. She attended a Recycling Committee meeting and later became a JOM advisor for that group.

Meskers, who is senior manager, Open Innovation, at Umicore in Belgium, said her most valuable experience, however, was being selected for the TMS Extraction & Processing Division Young Leader Professional Development Award.

“It was a wonderful experience,” she said. “I decided to take every opportunity the Award offered, including being a guest at a Board of Directors meeting. The entire Board and TMS staff knew me after that.”

Now, after 15 years of attending TMS Annual Meetings, she considers the community of relationships she has built there to be like a family.

Beginning in 2020, Meskers will serve as the chair of the TMS Extraction & Processing Division, and one of the things she hopes to do is to spread the word that her division is relevant and changing. “The extractive and processing industry contributes to global societal transitions—clean

mobility, circular economy, for example—and is changing and adapting to do so,” she said. “It’s my personal mission to show the relevance of what we’re doing to the rest of the world.”

Within TMS, she wants to help the Society stay relevant to its members, not only in the topics covered but also in the way they are covered. To do this, she recognizes the value of the bottom-up approach that TMS takes to its initiatives and emphasizes the importance of continuing to listen to new ideas.

“To make TMS initiatives happen, we need many active people,” said Meskers, who encourages any member with new ideas to volunteer with the Society—even if it’s for a limited amount of time. “You can volunteer for a while and then take a break if you need to.”

One of the benefits of volunteering with TMS, she said, is the ability to use her talents in a way that is different from her normal job. “It’s a different atmosphere,” she said, and it has helped her to see how strategy is made and how governance works before this was part of her normal job.

“TMS is a reference for me on organizing and collaborating with people,” said Meskers. “I can bring that knowledge to my work on other boards and in other situations.”

For Meskers, being involved in TMS ultimately means working on something bigger than yourself. “It’s about moving the community forward by working together across divisions, disciplines, and geographies—inspiring each other along the way.”

***“As I reflect on what TMS has given to me, I know it is time to give back.”***

**Ellen Cerreta**



**Paul R. Ohodnicki, Jr.,  
Functional Materials  
Division Chair**

Paul Ohodnicki, Jr. attended his first TMS Annual Meeting in graduate school, when he quickly realized that the meeting was a good match for his specific interests.

“The breadth and depth of the society allows me to remain connected with

my colleagues across the various fields in which I work, and also provides a platform to establish new communities within the field through targeted technical programming at annual meetings,” said Ohodnicki, who is a materials scientist and technical portfolio lead in the Functional Materials Team of the Materials Engineering & Manufacturing Directorate of the National Energy Technology Laboratory.

After this initial interaction, he reconnected with the

Society when he was working in his first position at PPG Industries. He was selected as the Young Leaders Professional Development Award recipient for the TMS Electronic, Magnetic, & Photonic Materials Division (now Functional Materials Division).

“I have been very fortunate to be the recipient of many opportunities, awards, recognitions, and leadership experiences over the years through my strong participation in TMS,” he said. “At this time in my career, I feel that it is important for me to give back to the materials science and engineering community.”

He is hopeful that, by taking on a leadership role, he can ensure the next generation of scientists and engineers within the Society also benefit from both existing and new opportunities.

“I believe that the area of Functional Materials is a major potential growth area for TMS,” said Ohodnicki, who will take on the role of Functional Materials Division chair in February. “I hope to play a key role in the successful realization of that potential through this leadership position.”

***“I’ve stayed engaged because of the power the Society has to bring people together to share relevant experiences, and in so doing, grow the entire materials community.”***

Charles Ward

***“Being a member of TMS for almost two decades, I now look forward to working with new members and helping them navigate their careers.”***

Judy Schneider

## **Are You the Next Member of the TMS Board of Directors?**

TMS is accepting nominations for two Board of Directors positions for the 2021–2024 term until January 15, 2020. The open positions are the Presidential Rotation and Programming Director.

The Presidential Rotation encompasses three successive one-year positions: Vice President, President, and Past President. All three roles are officer positions within the Society and carry unique responsibilities. The role of President includes serving as chair of the Board of Directors.

The Programming Director represents the entire membership in carrying out the professional activities of the Society concerned with programming.

Packages for applicants to these positions will be considered by the Society’s Nominating Committee, which will then recommend a candidate for each position to the Board of Directors.

If approved by the Board of Directors, these endorsed candidates will be presented to the general membership for approval by July 2020.

To access complete job descriptions and qualifications for each office, as well as the Nominee Statement Form and nomination instructions, visit [www.tms.org/BoardNominations](http://www.tms.org/BoardNominations). For additional information, contact Deborah Hixon, TMS Award Program Administrator, at [hixon@tms.org](mailto:hixon@tms.org).





## 250 Success Stories a Year. . .And Counting



**Garry Warren**  
*TMS Foundation Board  
of Trustees Chair*

Every year, *JOM* publishes articles introducing you to the latest recipients of the many student scholarships and TMS early career professional awards conferred by the TMS Foundation. As I read the

comments and stories of these individual honorees, what strikes me is that the money is usually not the most impactful aspect of the award.

Don't get me wrong. Meaningful financial assistance to any student or professional starting out on their career is important and appreciated. However, as Natalie Wieber, the 2020 TMS Materials Processing & Manufacturing Division (MPMD) scholarship recipient noted about this recognition, ". . .it gives me confidence in my efforts to join the field of materials science and engineering."

Neslihan Dogan, a 2019 TMS Extraction & Processing Division Young Leader, expressed gratitude for the potential doors that her TMS Foundation award could open: "This award will provide me recognition and visibility in my research community." And, Oliver Johnson, a 2019 MPMD Young Leader, expressed similar thanks for his TMS

Foundation support: "Being a member of TMS has provided a wide range of opportunities to contribute to and serve my professional community and for professional development. This award expands the scope of these opportunities, and I am grateful for that privilege."

Confidence. Recognition. Access. Impact. There is no price that you can place on the difference any of those experiences can make in a person's career. That's why every dollar donated to the TMS Foundation is so critical. Each year, the Foundation touches nearly 250 lives—many of them TMS members in the most vulnerable stages of their professional journeys. Over time, we have been proud to see a significant percentage of those individuals assume leadership roles in TMS, as well as within their organizations and the profession as a whole.

There is clearly a direct cause and effect between support of the TMS Foundation and the early success stories of many TMS members. That's why the TMS Foundation Board of Trustees adopted a new signature program statement: **The TMS Foundation supports students and young professionals with meaningful financial assistance and impactful career-building experiences.**

Conceptually, this reflects the TMS Foundation's core mission of supporting and advancing the next generation of professionals. However, as the challenges of establishing a career have grown more complex, we identified a need to shine an even brighter light on the importance of offering footholds to those TMS members who are starting on their career paths.

Our goal, in general, is to expand the TMS Foundation's impact even further and even beyond the 250 success stories that it contributes to every year. We have reason to be optimistic. In five years, the TMS Foundation endowment has grown from \$2 million to approximately \$3.1 million, with more supporters being added to our rolls every year. In many ways, the Foundation's own success story since it launched its revitalization in 2013 is one of the most compelling of all that we can share.

I realize that by the time you read this article, you will have received several requests and reminders to contribute to the TMS Foundation's 2019 year-end appeal. Please consider a gift, large or small. There are many worthy causes, but the TMS Foundation is one of a very few that enables you to give back to your profession in such a meaningful way. Please visit our new website at [www.TMSFoundation.org](http://www.TMSFoundation.org) for examples of the TMS Foundation's impact.

I thank you in advance for your generous support of the TMS Foundation and look forward to sharing even more success stories with you.



### There's Still Time to Make a Difference: Support the 2019 Year-End Appeal

**Deadline:** December 31, 2019

**Employer Match:** Register The Minerals, Metals & Materials Society for an employer match with your company. TMS (EIN: 25-1484913) is a qualified 501(c)3 tax-exempt organization.

**Donate Online:** Visit [www.TMSFoundation.org](http://www.TMSFoundation.org)/Contribute for our secure, easy-to-use, online contribution form.

**For Your Convenience:** You can now make your contributions with PayPal. You can also take advantage of our automatic monthly contribution option.

**Donate by Mail:** If you prefer, mail your donation to the TMS Foundation at 5700 Corporate Drive Suite 750, Pittsburgh, PA 15237

**Questions?:** Contact TMS Foundation Staff at [TMSFoundation@tms.org](mailto:TMSFoundation@tms.org) or 1-724-776-9000 for more information or to discuss your donation personally.

# Introducing the 2020 Class of TMS Scholars

**Ashley-Anne Bohnert**

Like the TMS scholarship recipients before them, the 2020 Class of TMS Scholars represent the future of the minerals, metals, and materials professions. Support from the TMS community helps ensure their prospects remain bright. While scholarships help lighten the financial burden of education, many TMS awards also include travel support for students to attend highly regarded professional meetings. As a result, recipients get the opportunity to expand their technical knowledge, connect with potential mentors, and begin growing their professional profile.

Many of the scholarships described in this article will be awarded at the TMS 2020 Annual Meeting & Exhibition (TMS2020) during technical division functions. The awards and lecture portions of division luncheons are open to all TMS2020 attendees, so be sure to support the 2020 TMS scholarship recipients during their special moment and congratulate them in person. Other awards and scholarships will be conferred at the TMS-AIME Awards Ceremony during TMS 2020. All are invited to attend. TMS2020 will be held from February 23–27, 2020 in San Diego, California.



Katelyn Adkison (left) was awarded the 2019 Kaufam CALPHAD Scholarship.

Brooklyn Carlson (above) receives the Extraction & Processing Division Scholarship from Christina Meskers, EPD Vice Chair

Rafael Rodriguez De Vecchis (below) accepts the 2019 Acta Materialia Inc. Undergraduate Scholarship from George "Rusty" Gray III, Acta Materialia Chair and Treasurer.



## Help Support Students with the TMS Foundation's Year-End Appeal

The scholarships featured in this article not only remove barriers to education but also support students in pursuing a deeper involvement in the greater materials community that can help open doors and build careers. These awards are made possible by the TMS Foundation and its generous donors. You can be part of the good work of the TMS Foundation by contributing to the 2019 year-end appeal. Every donation from individuals just like you enables the Foundation to fulfill its mission of providing meaningful financial assistance and impactful career-building experiences to students and early career professionals.

Visit [www.TMSFoundation.org/Contribute](http://www.TMSFoundation.org/Contribute) to make a one-time donation online or to set up a monthly gift. You can also make a contribution by check, made payable to the TMS Foundation and mailed to TMS, 5700 Corporate Drive Suite 750, Pittsburgh, PA 15237. For more information or to discuss a donation personally, contact TMS Foundation Staff at [TMSFoundation@tms.org](mailto:TMSFoundation@tms.org).



Tanner Livingston, University of Utah and 2019 Light Metals Division (LMD) Scholar, addressed the luncheon crowd with his "Light and Reactive Metals and their Importance to the Future of Energy."

## 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.*

#### William Carpenter South Dakota School of Mines & Technology

"I am very honored to receive this award from TMS and would like to extend my gratitude to the TMS scholarship committee. TMS has provided me with invaluable insight into the career paths and trends within the materials science and engineering community. In the most pragmatic way, TMS has given me the opportunity to meet experts within the metallurgical community and assisted in my career development. Through Material Advantage, I have had the opportunity to grow professionally and access scholarships to facilitate my education. I plan to pursue a Ph.D. in materials engineering focusing on novel complex alloys for energy applications."

### 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 process, structure, properties, and performance of electronic, photonic, magnetic, and superconducting materials, as well as materials used in packaging and interconnecting.*

#### Thomas Colburn Stanford University

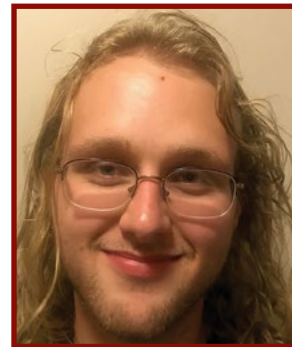
"Material Advantage has been transformative in my educational career by providing opportunities for me to present my research, network with fellow young scientists, and fund my academic pursuits through scholarships. For instance, I have had the chance to speak at the Materials Science & Technology 2019 conference, which has allowed me to share my research on an international stage while meeting and networking with fellow young scientists. After graduating from Stanford, I plan on pursuing a Ph.D. in chemical engineering or materials science. I am so grateful to the TMS Foundation, Battelle, and the Functional Materials Division for this honor and for helping me fulfill my educational goals."

### LIGHT METALS DIVISION (LMD) SCHOLARSHIP

*Awarded through the LMD and the TMS Foundation to outstanding sophomore or junior undergraduate students majoring in metallurgical and/or materials science and engineering with an emphasis on both traditional and emerging light metals.*

#### Samantha Schloder University of Pittsburgh

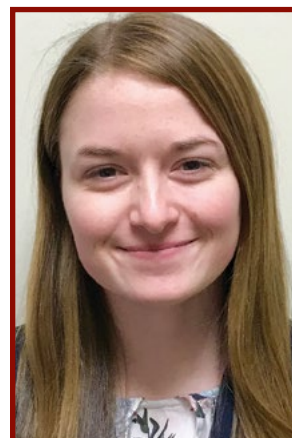
"Upon starting the materials science and engineering program at the University of Pittsburgh, I joined Material Advantage. Through this, I was introduced to numerous opportunities in research, internships, and scholarships. Scholarships such as this one are the reason why I succeed at school. Rather than worrying about money all the time, I can focus on my studies. Once I finish my undergraduate degree I hope to continue my education through a masters/doctorate program."



William Carpenter



Thomas Colburn



Samantha Schloder



Natalie Wieber

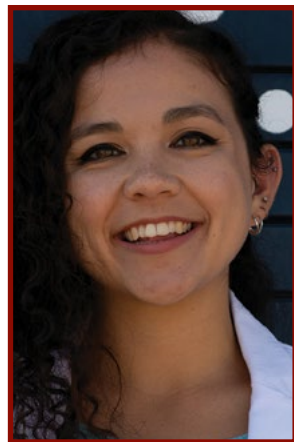
### **MATERIALS PROCESSING & MANUFACTURING DIVISION (MPMD) SCHOLARSHIPS**

*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.*

#### **Natalie Wieber**

*University of Tennessee, Knoxville*

“TMS has been a key and integral part of my education and career, especially after transferring institutions to pursue a degree in material science. When I transferred, I was introduced to Material Advantage. My involvement in Material Advantage gave me the opportunity to serve as a service and social chair for my university’s chapter. My involvement also showed faculty that I am passionate about material science, eventually facilitating my internship at Oak Ridge National Laboratory. I am so grateful for these opportunities as well as the MPMD scholarship because it gives me confidence in my efforts to join the field of material science and engineering! I plan on continuing my education in a Ph.D. program beginning fall of 2020, diving more deeply into ceramic materials and renewable energy applications.”



Jadzia Graves

### **STRUCTURAL MATERIALS DIVISION (SMD) SCHOLARSHIPS**

*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.*

#### **Jadzia Graves**

*University of Idaho*

“Material Advantage has allowed me to connect with my peers in a way that general classes have not. Since becoming involved, I have had greater opportunities to work with other students in my field and participate in events like the TMS Bladesmithing Competition. Attending the TMS annual meeting was an amazing opportunity to learn about recent occurrences in the world of materials, and it gave me a chance to present what I have learned in my own research. After I graduate I plan to pursue structural materials for aerospace applications. The SMD scholarship will help support my education, and it is a great honor to receive it.”

## **Open Doors with Material Advantage**

Material Advantage gives students access to technical resources, grant money, networking, and scholarships such as those highlighted in this article.

The Material Advantage student program allows undergraduate and postgraduate students to benefit from membership in four materials-related societies for a single membership fee.

Visit [www.materialadvantage.org](http://www.materialadvantage.org) to learn more or to join the program.

**MATERIAL ADVANTAGE**  
The Student Program for Materials Science and Engineering

*Everything Else Is Immaterial*



## SOCIETY AWARDS

### TMS INTERNATIONAL SYMPOSIUM ON SUPERALLOYS SCHOLARSHIP

*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.*

#### Hannah Walker

*University of Wisconsin Madison*

"I am extremely honored to be selected as a recipient for this scholarship! TMS and Material Advantage have been crucial in helping me explore my academic interests and connect with fellow students and professionals within the materials discipline. I am very grateful to the TMS International Symposium on Superalloys Committee—this scholarship helps substantially with the accessibility of

my education. After graduation, I am planning to pursue a graduate degree to further broaden my impact in the field."

#### Kyle Ventura

*University of Florida*

"I am incredibly grateful and honored to be a recipient of this scholarship. I would like to thank my adviser Gerhard Fuchs as well as my colleagues at the University of Florida for the help and support they have given me on my academic journey. Being recognized for my work with superalloys encourages me to continue the pursuit of this knowledge. As a member of my school's Material Advantage chapter, I participated in our Materials Bowl trivia team and made many professional connections as well as friends. After I graduate, I plan to work in industry to continue improving the knowledge in this field. Eventually, I want to be able to teach other aspiring engineers, encouraging them to help make new discoveries and advance the field of metallurgical engineering."



Hannah Walker



Kyle Ventura

## Become a 2021 TMS Scholar

Are you 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 2021 TMS Scholarship.

Applicants must submit a completed TMS scholarship application form; an individual statement; three recommendations; and an up-to-date transcript to Bryn Simpson, TMS Membership and Volunteerism Program Manager, at [bsimpson@tms.org](mailto:bsimpson@tms.org).

For more scholarship submission details and to access application forms, visit [awards.tms.org](https://awards.tms.org).



# TMS meeting headlines

View all upcoming meetings online at [www.tms.org/Meetings](http://www.tms.org/Meetings).

## Other Meetings of Note

### OTC Asia 2020

March 24–27, 2020  
Kuala Lumpur, Malaysia

### Offshore Technology Conference (OTC 2020)

May 4–7, 2020  
Houston, Texas, USA

### The 11th International Conference on Molten Slags, Fluxes and Salts

May 25–29, 2020  
Seoul, South Korea

### Technological Innovations in Metals Engineering (TIME 2020)

June 2–4, 2020  
Youngstown, Ohio, USA

### The 12th International Conference and Workshop on Numerical Simulation of 3D Sheet Metal Forming Processes (NUMISHEET 2020)

July 19–24, 2020  
Toronto, Ontario, Canada

### The 13th International Conference on the Technology of Plasticity (ICTP 2020)

July 26–31, 2020  
Columbus, Ohio, USA

### The 14th International Symposium on Superalloys

September 13–17, 2020  
Seven Springs, Pennsylvania, USA

### Materials in Nuclear Energy Systems (MiNES 2021)

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**[www.tms.org/TMS2020](http://www.tms.org/TMS2020)**

- Ricardo Lebensohn, Los Alamos National Laboratory; Markus Reuter, Helmholtz Institute Freiberg for Resource Technology; and Mark Easton, RMIT University, will be the featured speakers at the TMS2020 Division Luncheons.
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**Abstract Submission**

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### MASC FACULTY POSITION

#### USC Viterbi School of Engineering Mork Family Department of Chemical Engineering and Materials Science

The faculty of the Mork Family Department of Chemical Engineering and Materials Science invites applications for a tenure-track faculty appointment at any level in the area of materials science and engineering. The successful candidate is expected to develop a world-class research program within a stimulating interdisciplinary environment and demonstrate a strong commitment to teaching at both the graduate and undergraduate levels. Priority will be given to the overall originality and promise of the candidate's research work. The USC Viterbi School of Engineering is committed to increasing the diversity of its faculty and welcomes applications from women, underrepresented groups, veterans, and individuals with disabilities.

Both experimental and computational candidates are welcome to apply. Research area focus should be either experimental materials science with emphasis on synthesis and characterization of emerging quantum materials with novel functionalities or computational materials science and engineering with emphasis on large-scale reactive and quantum dynamics simulations. An ideal candidate would work well in teams with other scientists and engineers at Viterbi School of Engineering to achieve breakthrough results relevant to new technologies in the areas of synthesis and characterizing new and novel quantum materials.

The position is available starting August 16, 2020. Applicants must have earned a Ph.D., or equivalent degree in materials science and engineering or a related field, by the beginning of the appointment. Applications should include:

- a cover letter;
- a curriculum vitae detailing educational background, research accomplishments, and work experience;
- a research plan;
- a teaching and service plan;
- names of at least four professional references.
- Applicants are encouraged to include a succinct statement on fostering an environment of diversity and inclusion.

In order to receive full consideration, all materials should be received by December 7, 2019, but earlier application is encouraged.

*USC is an equal-opportunity educator and employer, proudly pluralistic and firmly committed to providing equal opportunity for outstanding persons of every race, gender, creed and background. The University particularly encourages women, members of underrepresented groups, veterans and individuals with disabilities to apply. The Viterbi School of Engineering at USC is committed to enabling the success of dual career families and fosters a family-friendly environment.*

**Apply at:**

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## **FACULTY OPENING IN MATERIALS SCIENCE AND ENGINEERING**

### **Georgia Institute of Technology**

#### **The School of Materials Science and Engineering**

The School of Materials Science and Engineering (MSE) at the Georgia Institute of Technology (GT) invites outstanding applicants for a tenure-track faculty position at the Assistant Professor level. Georgia Tech is an equal education/employment opportunity institution dedicated to building a diverse community. We strongly encourage applications from women, underrepresented minorities, individuals with disabilities, and veterans. Georgia Tech has policies to promote a healthy work-life balance and is aware that attracting faculty may require meeting the needs of two careers.

The search spans all application domains, material types and primary activities (experimentation, simulation, theory). Qualified candidates must possess a Ph.D. in Materials Science and Engineering or a closely related discipline, and a strong record of academic and research excellence. The ideal candidate will champion independent and collaborative research at the cutting edge of her/his field, be able to attract external funding to build strong sponsored-research activities, mentor graduate students successfully, develop and teach fundamental courses at the undergraduate and graduate levels in materials science and engineering, and make positive contributions to the School, Institute and community.

Georgia Tech is a top-ranked public research university situated in the heart of Atlanta, a diverse and vibrant city with great economic and cultural strengths. The Institute is a member of the University System of Georgia, the Georgia Research Alliance, and the Association of American Universities. Georgia Tech prides itself on its technology resources, collaborations, high-quality student body, and its commitment to diversity, equity, and inclusion. MSE at GT (<http://mse.gatech.edu>) has ~35 full time equivalent faculty whose research spans all forms, classes, and functionalities of materials to address various societal grand challenges. Opportunities abound for campus-wide interactions within the academic units in the Colleges of Science, Engineering, and Computing. Georgia Tech is home to 11 Interdisciplinary Research Institutes (<https://research.gatech.edu/interdisciplinary-research>) responsible for bringing together faculty and students across the colleges around a core research area. All faculty have access to state-of-the-art shared user facilities including the Materials Characterization Facility (<https://mcf.gatech.edu>), the Mechanical Properties Characterization Facility (<http://mpcf.gatech.edu>), the Polymer and Molecular Characterization Facility (<http://stami.gatech.edu/stami-resources>), the Micro-/Nano- Fabrication Facility (<https://cleanroom.gatech.edu>), and Bioengineering/Biosciences Core Facilities (<https://ibb.gatech.edu/research/core-facilities>).

To apply, please submit the following materials online at <https://academicjobsonline.org/ajo?joblist---2513-14725>: (1) a cover letter, (2) a curriculum vitae, (3) a 3-4 page research statement including past accomplishments and future plans, (4) a 1-2 page statement of teaching interests including an advising/mentoring philosophy, (5) a 1 page statement of plans and contributions to diversity, equity and inclusion, (6) and names and contact information for three to five references. Applications received by Nov. 15, 2019 will be given full consideration, but the search will continue until the position is filled. An earned doctorate is required by the start of the appointment, and a background check must be completed prior to employment.

## **MULTIPLE POSITIONS AT THE TENURE-TRACK ASSISTANT PROFESSOR LEVEL**

### **University of North Dakota**

#### **Department of Mechanical Engineering**

The Department of Mechanical Engineering at the University of North Dakota in Grand Forks, ND invites applications for multiple positions at the tenure-track assistant professor level in the manufacturing and/or materials stem of mechanical engineering with an expected start date of January 2020.

Candidates must have an earned doctorate in mechanical engineering or a closely related field. The successful candidate will demonstrate dedication to excellence in teaching undergraduate and graduate courses and outstanding communication and interpersonal skills. Selection will also be based on the candidate's ability to develop an externally-funded research program related to manufacturing and/or materials. Preference will be given to applicants who can align their research with existing or planned initiatives including, but not limited to, promoting energy security and environmental sustainability and/or driving world-changing developments of UAS.

Review of applications will begin September 15, 2019 and continue until the position is filled. For full consideration, applicants should submit a resume, 4-page statement of teaching and research interests, and contact information for three references.

Apply online for Position ##00013573, 00013686 using the following link: <https://campus.und.edu/human-resources/careers/job-openings-external.html?category=2000+Academic&subcategory=2110+Assistant+Professor>.

*UND is an AA/EEO/Vets/ Disabled employer. Women and minorities are especially encouraged to apply.*

## MULTIPLE TENURED/TENURE-TRACK FACULTY POSITIONS

### University of Maryland, College Park

### Department of Materials Science and Engineering

The Department of Materials Science and Engineering (MSE) at the University of Maryland, College Park (UMD) (<https://www.mse.umd.edu>) is embarking on a substantial expansion by seeking outstanding individuals for multiple tenured/tenure-track faculty positions in the areas of: (1) advanced microscopy that pushes the boundaries of materials characterization; (2) additive manufacturing of metals and composites, (3) materials for advanced and quantum computing, (4) materials for extreme environment in energy and defense systems, (5) computational materials science, and (6) applied experimental physics on emergent materials. Exceptional candidates in other areas of MSE will also be considered. At least one faculty will be hired jointly with the Institute for Research in Electronics & Applied Physics (IREAP) (<https://www.ireap.umd.edu>) – a UMD institute with a broad interest in interdisciplinary applied physics research. Successful applicants should have a Ph.D. in MSE, applied physics, or a related discipline. We seek candidates who can lead interdisciplinary materials research and establish vibrant research and teaching programs at the University of Maryland. Academic rank is open depending on qualifications, but at least three positions are expected to be filled at the junior faculty level. The Department and Institute are committed to promoting a climate of diversity and inclusion among our faculty. Women and minorities are particularly encouraged to apply, and candidates who have demonstrated a commitment to working with diverse populations through research, teaching and mentoring are encouraged to identify their experience in these areas. For best consideration, interested applicants should apply by December 20, 2019; review of applications will begin on November 1, 2019 and will continue on a rolling basis until positions are filled.

A cover letter, curriculum vitae, a statement of research and teaching interests, and names of at least three professional references should be submitted electronically to: <https://ejobs.umd.edu/>; position number 125337. Applicants who are interested in the joint MSE and IREAP position should state their interest in interdisciplinary applied physics research in their cover letters.

Questions about the positions can be directed to the Chair of the Search Committee, Prof. Ichiro Takeuchi (email: [takeuchi@umd.edu](mailto:takeuchi@umd.edu); Phone: (301) 405-6809).

*The University of Maryland, College Park, actively subscribes to a policy of equal employment opportunity, and will not discriminate against any employee or applicant because of race, age, sex, color, sexual orientation, physical or mental disability, religion, ancestry or national origin, marital status, genetic information, or political affiliation. Minorities and women are particularly encouraged to apply.*


### STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

Publication Title: *JOM*; Publication No.: 281-200; Filing Date: October 1, 2019; Issue Frequency: Monthly; No. of Issues Published Annually: 12; Annual Subscription Price: \$655; Complete Mailing Address of Known Office of Publication: 233 Spring Street, 6th Floor, New York, NY 10013; Contact Person: William Coatsworth; Telephone: (212) 815-0245; Complete Mailing Address of the Headquarters or General Business Office of Publisher: 233 Spring Street, 6th Floor, New York, NY 10013; Publisher: Springer Science & Business Media, 233 Spring Street, New York, NY 10013; Editor: Maureen Byko, TMS, 5700 Corporate Drive Suite 750, Pittsburgh PA, 15237; Owner: The Minerals, Metals & Materials Society, 5700 Corporate Drive Suite 750, Pittsburgh PA, 15237; Known Bondholders, Mortgagees and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages or Other Securities: None; The purpose, function and nonprofit status of this organization and the exempt status for federal income tax purposes has not changed during the preceding 12 months; Publication Name: *JOM*; Issue Date for Circulation Data Below: August 2019.

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Total No. of Copies (Net Press Run)	2,877	2,194
Paid and/or Requested Circulation		
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Paid In-County Subscriptions (Include advertiser's proof and exchange copies)	0	0
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# call for papers

**JOM is seeking contributions on the following topics for 2020. For the full Editorial Calendar, along with author instructions, visit [www.tms.org/EditorialCalendar](http://www.tms.org/EditorialCalendar).**



## June 2020

**Manuscript Deadline: January 1, 2020**

### Topic: Advanced Characterization of Interfaces and Thin Films

**Scope:** This topic focuses on the advanced characterization of materials interfaces at atomic and nanoscales in metal, alloys, ceramics, and polymers by various in-situ and ex-situ experimental techniques, such as x-ray and neutron diffraction, scanning electron microscopy, transmission electron microscopy, and atomic force microscopy. This topic also involves the understanding of materials interfaces by theoretical modeling approaches that allow the study of these processes on the atomic and molecular level.

**Editors:** Ritesh Sachan, Manuel Roldan Gutierrez, and Amit Pandey

**Sponsor:** Thin Films and Interfaces Committee

### Topic: Dry Metal Shaping and Forming (Invited)

**Scope:** In view of the 2 degree target for climate change, sustainable manufacturing processes are playing an increasingly important role. In order to save energy-intensive cleaning and drying processes in forming production, new approaches to carrying out forming processes are the focus of research in which lubricants, their application and removal can be dispensed with. This is based on various tool and process modifications that have become possible using new technologies in forming tool manufacturing. This invited special topic will feature papers presented at the Recent Developments in Biological, Structural and Functional Thin Films and Coatings symposium at the TMS 2020 Annual Meeting & Exhibition.

**Editors:** Soumendra N. Basu and Partha P. Mukherjee

**Sponsor:** Energy Conversion and Storage Committee

### Topic: Electrochemical Energy Conversion and Storage

**Scope:** Papers are sought on topics related to, but not restricted to: solid oxide and proton exchange membrane fuel cells, electrolyzers, batteries for energy storage, and hydrogen storage. Papers can address issues related to electrode, electrolyte, and interconnection materials; electrochemical processes at electrodes and electrolyte interfaces; catalysts and

catalytic mechanisms; infiltration to enhance catalytic activity and reduce poisoning effects; durability issues; and advances in characterization and modeling techniques.

**Editors:** Soumendra N. Basu and Partha P. Mukherjee

**Sponsors:** Energy Conversion and Storage Committee

### Topic: Metal and Polymer Matrix Composites

**Scope:** This topic will cover recent progress in metal and polymer matrix composites, including: fiber-reinforced composites; natural fiber reinforced composites; solid and hollow particle reinforced composites; nanocomposites; fabrication methods and surface modification of micro- and nanoscale reinforcements; development of processing methods for composite materials; and modeling and simulation.

**Editors:** Nikhil Gupta and Tomoko Sano

**Sponsor:** Composite Materials Committee

### Topic: Quantum Materials for Energy-Efficient Computing

**Scope:** Quantum materials hold great potential for becoming crucial components of future generations of computers. This special topic covers various state-of-the-art computational techniques, such as density-functional theory calculations that provide deeper understanding of quantum materials and accelerate their discovery.

**Editors:** Houlong Zhuang, Shawn Coleman, Srikanth Patala, Jacob Bair, and Sugata Chowdhury

**Sponsor:** Computational Materials Science and Engineering Committee

## July 2020

**Manuscript Deadline: February 1, 2020**

### Topic: Characterization of Amorphous Materials

**Scope:** This topic will include, but is not limited to, characterization of amorphous solids and possibly liquids using advanced analytical techniques such as electron microscopy, x-ray radiation, thermal analyses, spectroscopy, atom probe tomography, etc. Particular emphasis will be paid to lesser-known characterization techniques used for amorphous materials.

**Editors:** Yunus Eren Kalay, Rajiv Soman, and Zhiwei Peng

**Sponsor:** Materials Characterization Committee

### **Topic: Machine Learning Applications in Advanced Manufacturing Processes**

**Scope:** This special topic focuses on reducing waste, energy usage and carbon emissions, and spurring innovation in materials development and production. Advances in digital manufacturing, process control, predictive maintenance, and automation can be realized by integration of data analytics and validated models to ensure product quality, optimize operations, enhance productivity, and improve efficiency.

**Editors:** Donna Guillen, Judy Schneider, and Srikanth Patala

**Sponsors:** Energy Committee; Additive Manufacturing Committee; Computational Materials Science and Engineering Committee

### **Topic: Recycling Silicon and Silicon Compounds**

**Scope:** Silicon and silicon compound recycling is needed for a cleaner and greener environment. These materials can be reused in the manufacturing of solar cells and panels and other industries such as electronic industries. The scope of this special topic is concerned with recycling of all types of silicon, silicon products, and silicon compounds including silicon wafers, silicon poly chunk, IC grade, ingots, IC flakes, etc.

**Editor:** Shadia Ikhmayies

**Sponsor:** Recycling and Environmental Technologies Committee

### **Topic: Thermodynamic Modeling of Sustainable Non-Ferrous Metals Production**

**Scope:** Papers covering experimental investigations, thermodynamic modeling, metallurgical process optimization, resource efficiency and environmental issues, particularly those pertaining to non-ferrous metallurgical processes, are invited. Manuscripts intended for a broad readership and review papers are especially encouraged.

**Editors:** Fiseha Tesfaye, Allie Anderson, and Mingming Zhang

**Sponsors:** Process Technology and Modeling Committee; Recycling and Environmental Technologies Committee

## **August 2020:**

**Manuscript Deadline: March 1, 2020**

### **Topic: Additive Manufacturing for Energy Applications (Invited)**

**Scope:** Exploration of additive manufacturing (AM) techniques within energy sectors has shown an increase of applications, a large variety of materials, and industry specific design and qualification requirements. This invited topic will feature manuscripts based on experimental and computational approaches in the following topic areas:

- Processing-microstructure-property relationship of AM fabricated materials for structural components in energy sectors
- In-situ sensor development and in-situ processing and characterization

- Advances in AM design methodologies, new material designs and AM techniques
- Modeling and simulations for design of high-performance AM fabricated materials
- Qualification approaches
- Economic advantages: Case studies

Only papers presented at the Additive Manufacturing for Energy Applications II symposium at the TMS 2020 Annual Meeting & Exhibition will be considered for this topic.

**Editors:** Paul Prichard, Peeyush Nandwana, Matt Dunstan, James Paramore, and Kathy Lu

**Sponsor:** Additive Manufacturing Committee

### **Topic: Additive Manufacturing: Beyond the Beam Technology (Invited)**

**Scope:** This invited topic will explore print process and post-print processing variables of non-beam solid state print technologies, which determine the properties, application performance, economics and enable component functionality. These processes include but are not limited to: binder jetting, material extrusion, filament process, nano-inkjet printing and sintering.

**Editors:** Paul Prichard, Peeyush Nandwana, Matt Dunstan, James Paramore, and Kathy Lu

**Sponsors:** Powder Materials Committee; Additive Manufacturing Committee

### **Topic: Advanced Processing and Additive Manufacturing of Functional Magnetic Materials**

**Scope:** Papers are invited on advanced processing and advanced manufacturing of functional materials with particular emphasis on magnetic materials. In particular, papers addressing permanent magnets, magnetocaloric materials, soft magnets, magnetic shape memory alloys, and multiferroics are welcome. Additive approaches to similar classes of functional materials are invited as well.

**Editors:** Scott McCall and Ikenna Nlebedim

**Sponsor:** Magnetic Materials Committee

### **Topic: Metastable Phases and Phase Equilibria**

**Scope:** Invited authors will provide original research submissions on next-generation alloys enabled by the design and control of metastable phases. In these alloys, outstanding properties are achieved through a combination of carefully tailored chemical composition and thermal processing. Examples include metastable austenite in TRIP, TWIP and Q&P steels, beta-stabilized titanium alloys, gamma double prime precipitates in nickel superalloys, high entropy alloys, and spinodal decomposition during aging of aluminum alloys.

**Editors:** Gregory Thompson, Raj Banerjee, Eric Lass, and Bij-Na Kim Lee

**Sponsor:** Phase Transformations Committee



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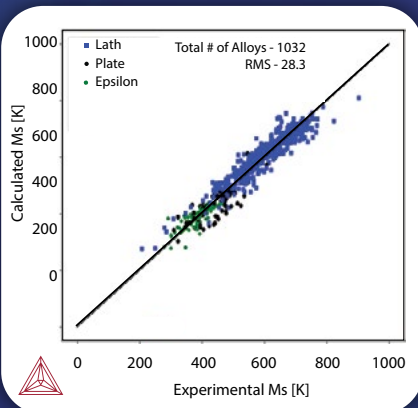
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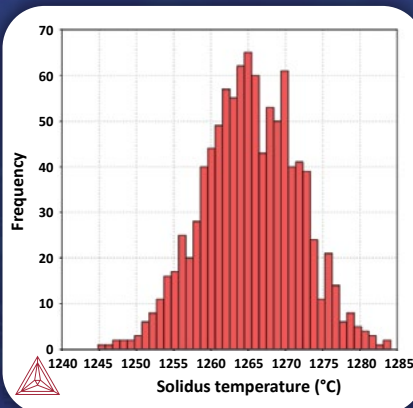
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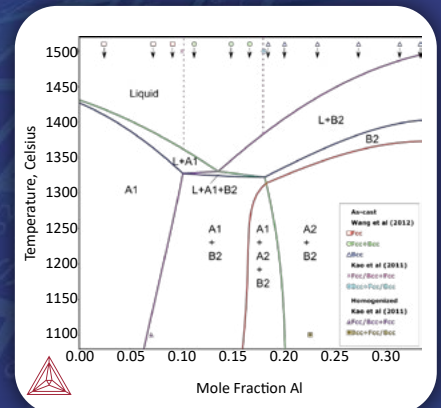
Comparison of calculated and experimental Ms temperatures for a wide range of steels

#### Nickel



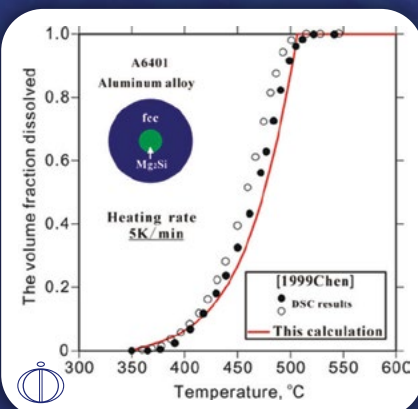
Variation in solidus temperature over 1000 compositions within alloy 718 specification

#### High Entropy Alloys



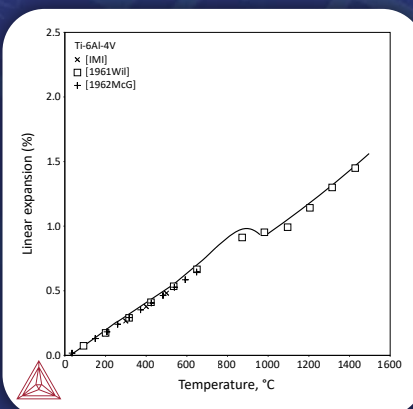
Calculated phase diagram along the composition line of CoCrFeNi-Al

#### Al Alloys



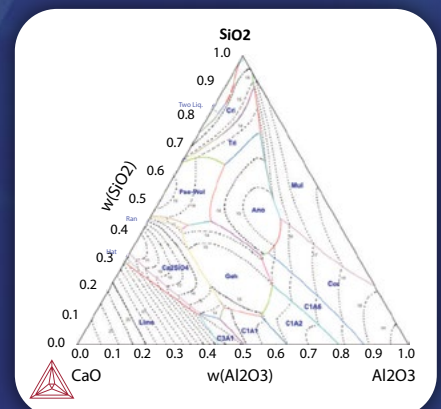
Dissolution of Mg<sub>2</sub>Si precipitate in Alloy A6401

#### Ti and TiAl Alloys



Linear expansion vs Temperature for Ti-6Al-4V

#### Oxides



Ternary liquidus projection in oxide systems