



**FEBRUARY 27-MARCH 3, 2022**  
**ANAHEIM CONVENTION CENTER & ANAHEIM MARRIOTT**  
**ANAHEIM, CALIFORNIA, USA**

*Current as of February 17, 2022 - Updated from Print Version*

# CONFERENCE GUIDE

**General Meeting Information, Maps, Exhibit Directory,  
and Awards Program Inside**

**#TMSAnnualMeeting • [www.tms.org/TMS2022](http://www.tms.org/TMS2022)**

## **FIND MORE MEETING DETAILS:**

Download the TMS2022 Mobile App for the most up-to-date schedule.



Scan this QR code or visit [www.tms.org/TMS2022](http://www.tms.org/TMS2022) for a PDF of the full **Technical Program**, current as of February 11, and **Calendar of Events**, current as of February 21.



Images may not represent TMS2022 health and safety measures, such as masks and social distancing.



The new EVY Compact Vacuum Cleaner

# FRESH THINKING, SMART CLEANING

## The cleanest

- Filters even the finest dust:  
2 - 0,2 micron
- Cleans without dust clouds
- Sustainable: better for men & machine

## The leanest

- Compact, highly manoeuvrable model
- Reduces your Total Cost of Ownership
- Single out of stock model

## The meanest

- Fully continuity-adjusted
- Collects all dust, ready to re-use & re-market
- It's all about Serving Progress!

For more information about EVY: [www.hencon.com/evy](http://www.hencon.com/evy)

## A MESSAGE FROM THE 2021 TMS PRESIDENT: ELLEN CERRETA

I am so pleased to welcome you back **in person** to the TMS 2022 Annual Meeting & Exhibition (TMS2022)! After meeting virtually last year, it is wonderful to see our community coming together again.

It will be a great week, filled with all the elements that make the TMS Annual Meeting & Exhibition such a can't-miss event: the chance to meet face-to-face, to talk about topics both important and casual, and to experience a community of people who share your interests.

### Here are some things you should know about this year's meeting:

#### It's Our Anniversary:

Celebrate with us! You should have received a commemorative pin when you picked up your badge at registration. Wear it throughout the week to help us celebrate 150 years of convening minerals, metals, and materials professionals as the shared history of TMS and The American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME). Learn more about our history at [www.tms.org/OurHistory](http://www.tms.org/OurHistory) and see how much you know about TMS's past through the quiz on the TMS2022 App.

#### There's a Lot Going On:

Many special events that were planned for TMS2021 have been shifted to this year's meeting so that they could take place in person. As a result, there's a *lot* going on at TMS2022! In addition to attending talks in our extensive technical program, you can browse entries to the TMS Bladesmithing Competition in the Exhibit Hall and take part in *three* co-located meetings being held at TMS2022. The Fourth Summit on Diversity in the Minerals, Metals, and Materials Professions (DMMM4); Furnace Tapping 2022; and REWAS 2022 will all take place this week, and you have full access to the technical programming of these events.

#### Recorded Presentations Will Be Available March 14:

Sometimes there's too much to take in during a single week, but you'll have a second chance to catch presentations that you've missed or to see new presentations from speakers who were unable to travel to Anaheim. On-demand access to presentations begins Monday, March 14, and will be available through April 30, 2022.

We also recognize that some things will be a bit different this year. Here are a few key items you should know about TMS2022:

#### We Have New Safety Measures:

You've no doubt received our messages about the health and safety measures we've put in place to ensure that all attendees feel safe and comfortable while attending this week's meeting. I encourage you all to do your part to make this year's meeting a success by following these protocols while you're with us this week. You can learn more specifics on page 13.

#### This Year, You Need the App:

This conference guide is designed to provide you with preliminary information on how to navigate the meeting, but you'll need to download the TMS2022 app, access the browser version, or consult the technical program, calendar of events, and meeting details on the TMS website to find the most updated information on event locations, speakers, and presentation times.

#### Some Sessions Will Be Live-Streamed:

Being back in-person is great, but if you find you need a break during the week, you can watch select sessions through the internet connection in your hotel room. Check the TMS2022 App for a full listing of our live-streamed programming.

Thank you all for joining us for this exciting return to the TMS Annual Meeting & Exhibition. Enjoy your week and welcome back!

Sincerely,



Ellen Cerreta  
2021 TMS President



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**Health & Safety Information**  
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**Preview of the All-Conference Plenary**  
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**Technical Program at a Glance**  
(see page 29)



**TMS-AIME Awards Ceremony Program**  
(see page 34)



**TMS2022 Exhibit Directory**  
(see page 45)



**TMS Guide for New Members**  
(see page 53)

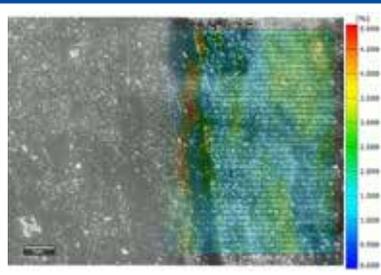
## Building the Future Microscopy Solutions for Engineering Materials

### LabDCT Pro Imaging



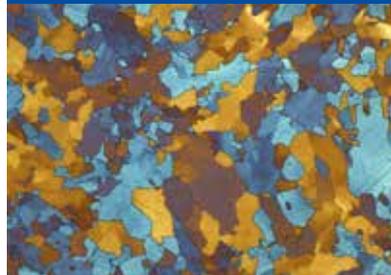
3D grain map of a  $\beta$ -Ti sample, 1 x 1 x 3 mm, scanned by diffraction contrast tomography

### SEM integrated *in situ*



Integrated in situ tensile and heating experiments on steel. Secondary electron image (left) and digital image correlation strain map overlaid (right).

### Optical Metallography



Pure iron in reflected brightfield observed with inverted metallograph



Seeing beyond

## Find Up-to-Date Event Schedules

TMS2022 organizers have made every effort to develop a strong technical program for this year's meeting, but last-minute schedule changes in travel plans are to be expected. While organizers will work to minimize schedule disruptions as much as possible, we urge all attendees to stay up-to-date on schedule changes using the following tools.

Please note that a printed version of the TMS2022 technical program will not be available to attendees. Instead, you can access updated technical information through the TMS2022 app or by downloading the technical program PDF from [www.tms.org/TMS2022](http://www.tms.org/TMS2022).

## Download Technical Program

Download a print- or mobile-friendly version of the TMS2022 Technical Program in searchable PDF format. For real-time programming updates, you can view the online session sheets. [www.tms.org/TMS2022/TechnicalProgram](http://www.tms.org/TMS2022/TechnicalProgram).

## Stay Updated All Week Long

Make sure you stay up-to-date on major schedule changes and key events at the TMS 2022 Annual Meeting & Exhibition by taking these simple steps:

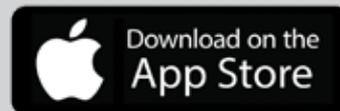
1. **Enable Notifications from the TMS2022 App:** You'll be updated a few times each day of key events happening at the conference and of any major scheduling changes. Keep an eye on your phone and the app.
2. **Check *TMS2022 News* Each Morning:** Each issue of the at-meeting newsletter contains a listing of the day's major events and any late-breaking schedule news. It will also offer photos and recaps from previous days' events. Check your e-mail daily or read the most recent issue through the TMS2022 app.
3. **Connect with Other Attendees on Twitter:** Use #TMSAnnualMeeting to post information and updates through Twitter for other TMS2022 attendees to view.

## NEW FOR 2022: Welcome Back Reception

All attendees are encouraged to join their colleagues for the Welcome Back Reception on Sunday evening, from 7:00 p.m. to 8:00 p.m. on the third floor of the Anaheim Convention Center. (Ballroom ABCD) Network with other attendees in your technical division before the start of technical programming.

## HIGHLY RECOMMENDED:

### Download the "TMS Annual Meeting" App



Build a personalized schedule, view the most up-to-date technical program information, and more with the TMS 2022 Annual Meeting App. To download, search "TMS Annual Meeting" in the App Store or the Google Play™ Store. You can also use a web-based version of the app by visiting [www.tms.org/TMS2022app](http://www.tms.org/TMS2022app).

The app also allows users to:

- View the most up-to-date program
- Access full abstracts and speaker information
- Create a personalized conference agenda
- Learn about meeting exhibitors and sponsoring companies
- Communicate with other attendees
- View local area and hospitality information
- Access *TMS2022 News*

### PLEASE NOTE: LOG IN REQUIRED

To use the app or web platform you will need to log in using the same e-mail address you used when registering for TMS2022. Your password is your registration ID (generally formatted 22-XXXX).

Can't remember which e-mail you registered with? Check the printed ticket with your registration badge titled "Use the TMS 2022 Annual Meeting App" for a reminder.

## Find Featured Session Information at the TMS2022 Website



### DMMM4:

View programming plans, including keynote and invited speakers, for the Fourth Summit on Diversity in the Minerals, Metals, and

Materials Professions. Programming will be held Wednesday and Thursday.

[www.tms.org/TMS2022/DMMM4](http://www.tms.org/TMS2022/DMMM4)



### Furnace Tapping 2022:

Learn more about the programming plans, keynote speakers, and panel discussions for this co-located meeting, sponsored

by TMS and the Southern African Institute of Mining and Metallurgy.

[www.tms.org/TMS2022/FurnaceTapping](http://www.tms.org/TMS2022/FurnaceTapping)



### REWAS 2022:

The 7th installment of the REWAS conference series will focus on Developing Tomorrow's Technical Cycles. Six symposia are

planned as part of REWAS 2022, along with a plenary session of invited speakers.

[www.tms.org/TMS2022/REWAS](http://www.tms.org/TMS2022/REWAS)



### Honorary Symposia:

Five symposia are planned throughout the week honoring distinguished TMS members:

- REWAS 2022: Coupling Metallurgy and Sustainability: An EPD Symposium in Honor of **Diran Apelian**
- Failure, and a Career That is Anything But: An LMD Symposium Honoring **J. Wayne Jones**
- Magnetics and the Critical Materials Challenge: An FMD Symposium Honoring **Matthew J. Kramer**
- Primary Aluminum Industry - Energy and Emission Reductions: An LMD Symposium in Honor of **Halvor Kvande**
- Seeing is Believing—Understanding Environmental Degradation and Mechanical Response Using Advanced Characterization Techniques: An SMD Symposium in Honor of **Ian M. Robertson**

Learn more at

[www.tms.org/TMS2022/HonorarySymposia](http://www.tms.org/TMS2022/HonorarySymposia)

## Featured Sessions:

Throughout the week, TMS2022 will hold featured sessions of invited presentations. Learn more about planned presenters and their topics.

[www.tms.org/TMS2022/FeaturedSessions](http://www.tms.org/TMS2022/FeaturedSessions)

Featured sessions include:

- Light Metals Keynote Session
- Magnesium Keynote Session
- Additive Manufacturing Session
- Acta Materialia Awards Session
- Frontiers of Materials Symposia

## Special Lectures:

Preview talks by award recipients, luncheon lecturers, and more. [www.tms.org/TMS2022/SpecialLectures](http://www.tms.org/TMS2022/SpecialLectures)

## Find Networking and Special Event Details at the TMS2022 Website

View descriptions of social and networking events, student activities, and more through the events section of the TMS2022 website at

[www.tms.org/TMS2022/Events](http://www.tms.org/TMS2022/Events).

There you'll find the following:

### Calendar of Events:

View a complete Calendar of Events through the Attendee Toolbox section of the TMS2022 website.

[www.tms.org/TMS2022/Toolbox](http://www.tms.org/TMS2022/Toolbox)

### Networking and Social Events:

View a listing of networking and social events, with brief descriptions for each, and make a place in your schedule for these activities.

[www.tms.org/TMS2022/Events](http://www.tms.org/TMS2022/Events)

### Student and Young Professional Events:

Special events and activities are planned throughout the week for undergraduate students, graduate students, and early career professionals. Learn more about programming plans.

[www.tms.org/TMS2022/Events](http://www.tms.org/TMS2022/Events)



## Restaurants

- 1 Agio Ristorante
- 2 Anaheim Packing District/MAKE-/Anaheim Brewery  
Umami Burger/Cultivation Kitchen/Pali Wine Co.  
Unsung Brewery/Jav's BBQ
- 3 Anaheim White House
- 4 Mix Restaurant /Baja Fresh  
Sbarro/Submarina/Just Grillin'
- 5 Benihana Anaheim
- 6 Buca di Beppo
- 7 Center Street Promenade-MAKE/ Colony Wine Merchant/  
Good Food/Hummus Bean/Poki/Nometry/Pour  
Vida/Promenade Pub/Decades/Okayama Kobo  
Bakery & Café
- 8 Coco's (2 locations)
- 9 Coffee Bean & Tea Leaf
- 10 Denny's (2 locations)
- 11 Disney's PCH Grill/Surfside Lounge/The Sand Bar
- 12 Garden Court Bistro/Hanagi Japanese Restaurant
- 13 Goofy's Kitchen, Steakhouse 55
- 14 IHOP Restaurant
- 15 IHOP Restaurant
- 16 In-N-Out
- 17 Jägerhaus German Restaurant
- 18 Jimboys Tacos
- 19 Joe's Italian Ice & Ice Cream
- 20 JT Schmid's Brewhouse & Eatery
- 21 JW Rooftop Bar & Lounge/JW Signature Restaurant
- 22 La Casa Garcia
- 23 Mama Cozza's Italian Restaurant
- 24 Marri's Pizza & Pasta
- 25 MasalaCRAFT
- 26 McDonald's (three locations)
- 27 Mimi's Cafe
- 28 Morton's The Steakhouse
- 29 Napa Rose/Storyteller's Café/  
GCH Craftsman Bar & Grill
- 30 Nova Kitchen & Bar
- 31 nFuse/The Market
- 32 Oasis Kitchen & Bar
- 33 Palm Tree Café
- 34 Panera Bread
- 35 Pho Ha Plus Vietnamese Cuisine and Bar
- 36 Savor 1855
- 37 The Fifth Rooftop Bar
- 38 The Pizza Press
- 39 THE RANCH Restaurant & Saloon
- 40 Red Lion Hotel Restaurant
- 41 Red Robin/Outback Steakhouse/Joe's Crabshack/  
Oggi's Pizza & Brewing Co.
- 42 Roscoe's Chicken & Waffles
- 43 Ruby's Diner, Anaheim
- 44 Ruth's Chris Steak House
- 45 Stadium Promenade-  
Prime Cut Café/Old Crow Smokehouse/King's Fish  
House/Lazy Dog Café/Chili's/The Tilted Kilt  
Which Wich/Starbucks
- 46 Subway Sandwiches
- 47 The Catch Anaheim
- 48 TOGO's/Baskin-Robbins/Fresca's/Starbucks/  
Denny's/Panda Express/Carl's Jr.
- 49 Tony Roma's
- 50 Tru Grits
- 51 Zov's

**Show What You Know  
about TMS History**  
Take the quiz on the  
TMS2022 App



**Browse Meeting Highlights**  
Scan this QR Code to browse the  
TMS2022 website for additional  
meeting information.



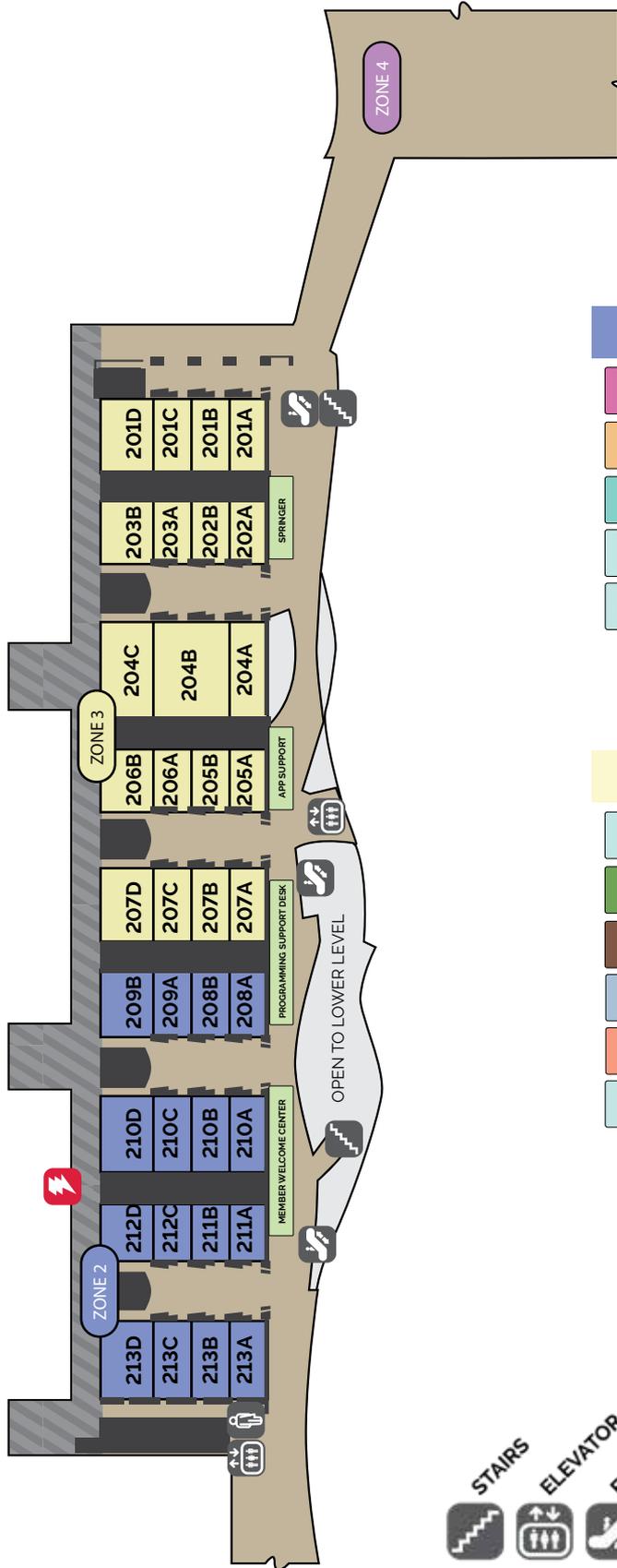
ANAHEIM CONVENTION CENTER (ACC) CAMPUS



ANAHEIM CONVENTION CENTER: PLAZA LEVEL



ANAHEIM CONVENTION CENTER: LEVEL TWO



**ZONE 2**

- MATERIALS PROCESSING
- ENERGY & ENVIRONMENT
- LIGHT METALS
- MEMBER WELCOME CENTER
- PROGRAMMING SUPPORT DESK

**ZONE 3**

- LIVESTREAM STUDIO
- BIOMATERIALS
- CORROSION
- NUCLEAR MATERIALS
- CHARACTERIZATION
- APP SUPPORT DESK

- STAIRS
- ELEVATOR
- ESCALATOR
- MOTHER'S ROOM
- GENDER NEUTRAL RESTROOM
- FIRST AID
- DEFIBRILLATOR

ANAHEIM CONVENTION CENTER: NORTH LEVEL 200



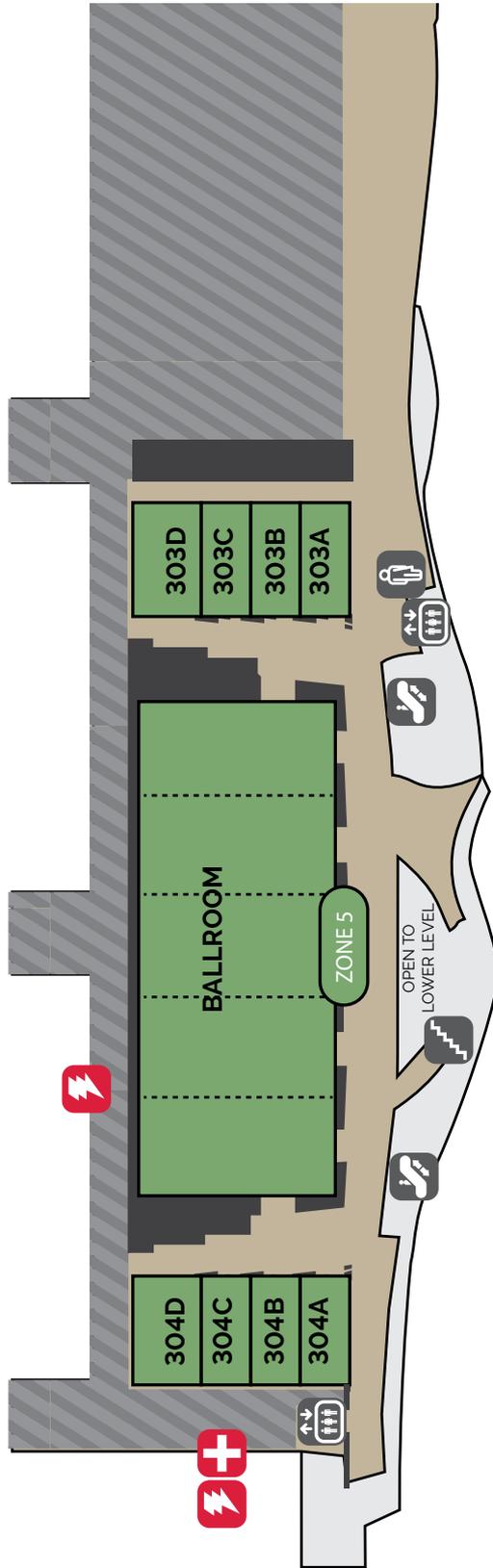
**ZONE 4**

- ADDITIVE TECHNOLOGIES
- MATERIALS DESIGN
- PHYSICAL METALLURGY
- ADVANCED MATERIALS
- NANOSTRUCTURE MATERIALS & HETEROSTRUCTURED MATERIALS
- SPECIAL TOPICS

STAIRS ELEVATOR ESCALATOR MOTHER'S ROOM GENDER NEUTRAL RESTROOM FIRST AID DEFIBRILLATOR

MEETING INFORMATION

ANAHEIM CONVENTION CENTER: LEVEL THREE

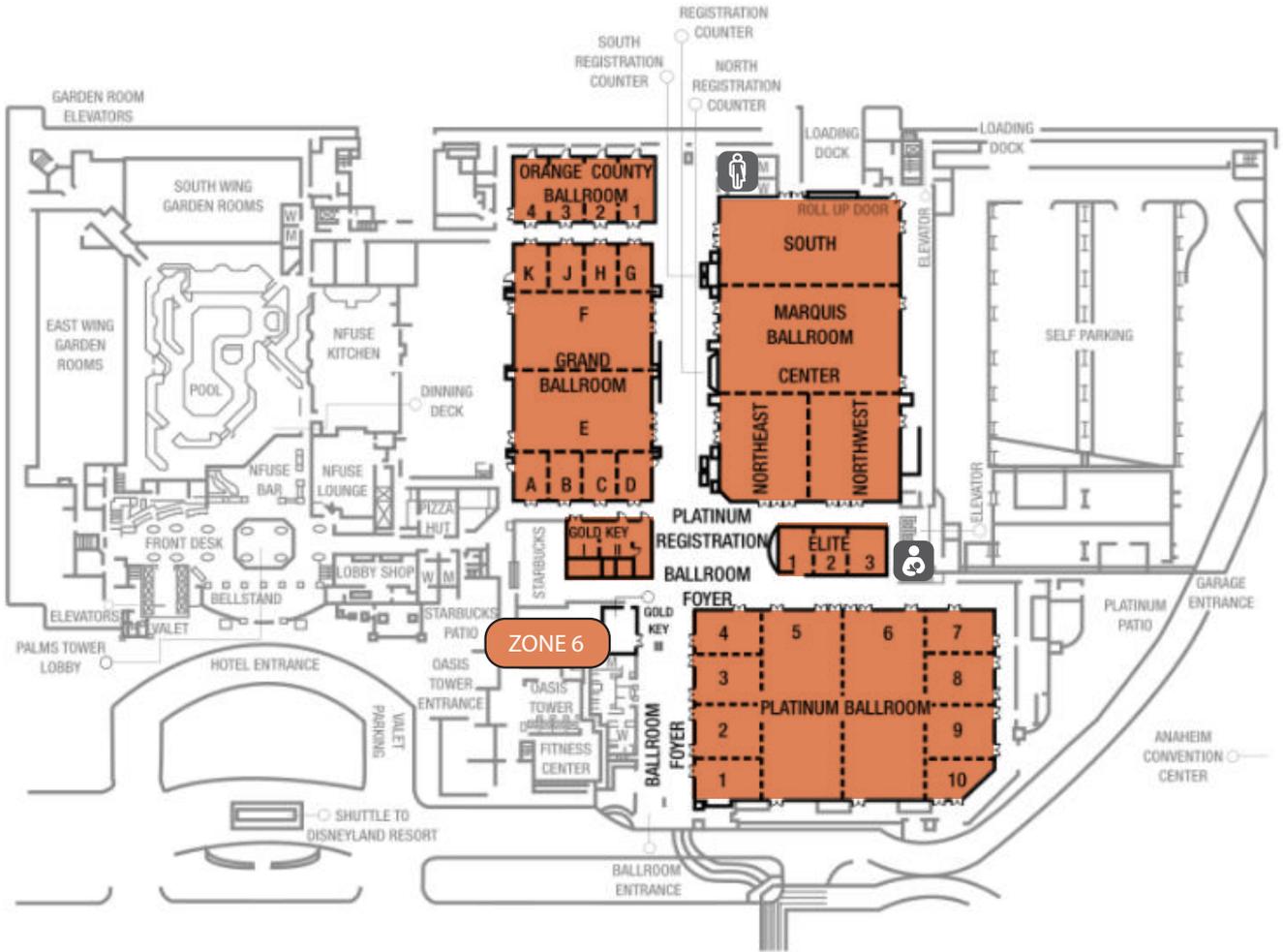


**ZONE 5**

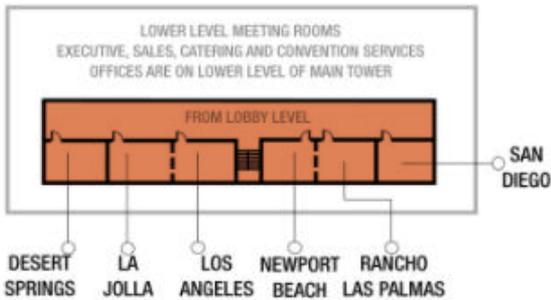
- ELECTRONIC MATERIALS
- MECHANICS & STRUCTURAL RELIABILITY

- STAIRS
- ELEVATOR
- ESCALATOR
- MOTHER'S ROOM
- GENDER NEUTRAL RESTROOM
- FIRST AID
- DEFIBRILLATOR

ANAHEIM MARRIOTT: MEETING ROOMS



ZONE 6



**ZONE 6**

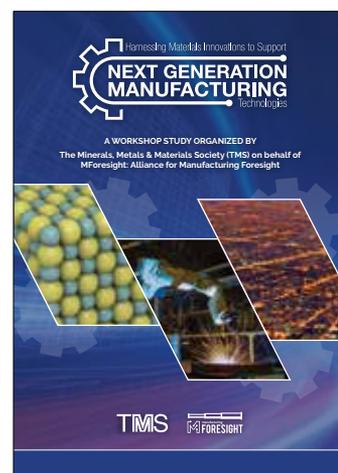
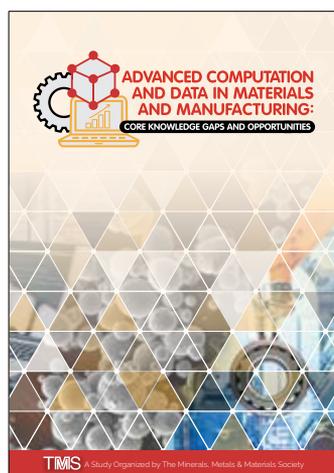
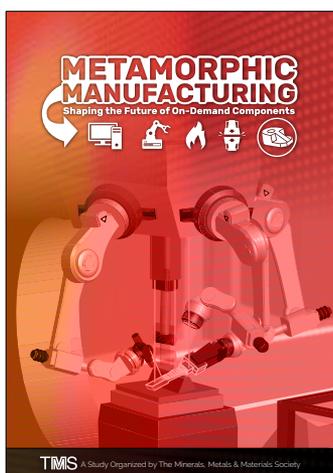
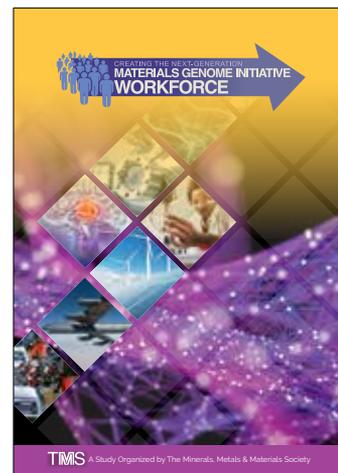
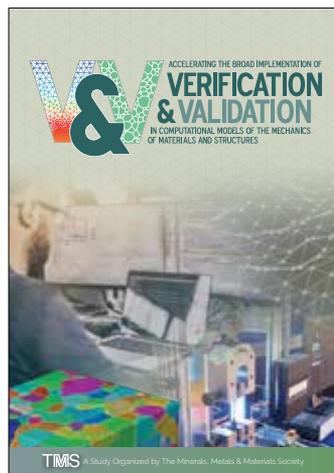
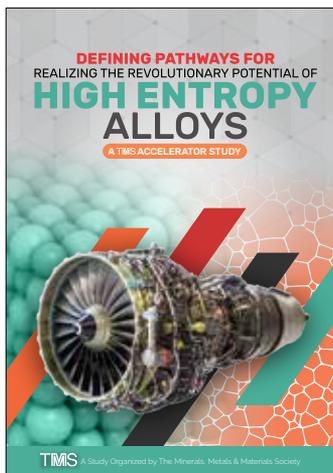
- AIME-TMS AWARDS CEREMONY
- BLADESMITHING AWARDS
- COMMITTEE MEETINGS
- DMMM4 EVENTS

- STAIRS
- ELEVATOR
- ESCALATOR
- MOTHER'S ROOM
- GENDER NEUTRAL RESTROOM
- FIRST AID
- DEFIBRILLATOR

# TMS STUDIES

TMS convenes respected leaders from the minerals, metals, and materials communities to develop influential science and technology accelerator studies.

## The Latest Open-Access Research from TMS



Take advantage of these resources by downloading your free copies today at: [www.tms.org/studies](http://www.tms.org/studies)

## Health and Safety

Protecting the health and safety of all TMS2022 participants is our top priority. To that end, TMS will follow the health and safety guidance of local, state, and federal health authorities; comply with California's strict conference requirements; consult best practices in the association community; and contract with qualified experts to manage our health and safety profile.

### Proof of Vaccination/ Negative COVID-19 Tests

You will only need to provide proof of vaccination or a negative test on your first day of the conference. You will need to wear the wristband provided for the remainder of the week.

### Mask Requirements

Masks must be worn properly in all TMS2022 event spaces (except when giving a presentation at the podium or actively eating or drinking). If you don't have a mask, we will have some available on request.

### On-site COVID Testing

For travelers who must provide a negative COVID test before returning home, on-site testing will be available for a fee at the Anaheim Convention Center from Tuesday, March 1, through Thursday, March 3. You can book on-site testing appointments and find a list of additional local testing facilities on the TMS2022 Health and Safety website at [www.tms.org/TMS2022/Health](http://www.tms.org/TMS2022/Health)

### What To Do If You're Sick

Anyone who is advised to isolate or quarantine based on current Centers for Disease Control guidelines cannot attend TMS2022 events. When a registrant is clear of restrictions, that registrant is welcome. If you are experiencing COVID-19 symptoms and wish to get tested, you can find a list of local testing facilities on the TMS2022 Health and Safety website at [www.tms.org/TMS2022/Health](http://www.tms.org/TMS2022/Health)

### For More Information

Find more details at the TMS2022 Health and Safety website: [www.tms.org/TMS2022/Health](http://www.tms.org/TMS2022/Health)



On-site COVID testing will be available for a fee at the Anaheim Convention Center Tuesday, March 1, through Thursday, March 3.



Masks must be worn properly in all TMS2022 event spaces (except when giving a presentation at the podium or actively eating or drinking).

## Emergency Procedures

In the event of an emergency, being prepared to react effectively is the most critical step in ensuring the health and safety of yourself and those around you.

### Know Your Surroundings

Please take a few moments to review the maps of the TMS2022 facilities available on pages 5-11 of this conference guide and on the TMS2022 App. When you enter these buildings, familiarize yourself with the exits and the stairs leading to those exits. When you arrive at your session or event location, look for the emergency exits that are in proximity to you

## At the Anaheim Convention Center

### Medical Emergencies

If emergency medical assistance is needed, please contact the Convention Center's Security Control Center at 714-765-8975 or dial 8975 from any house phone.

During event hours, one or more First Aid Stations will be open and staffed to treat walk-in first aid needs. These locations can be found on the maps in this guide.

### Alarms and Evacuations

When triggered, horns and flashing strobe devices, accompanied by a pre-recorded announcement, will activate in the affected zone. The alarm system is connected to the City of Anaheim Fire Department, which will dispatch fire units to the facility.

If you are in an area that has an active alarm, please move immediately to an emergency exit. Remember that elevators and escalators will not be available for use during an evacuation. If you are above the lobby level in the meeting rooms, move toward the emergency staircases, located at either end of the floor and in the middle of the floor. Convention Center personnel will respond quickly to assist with the evacuation and with re-entry once the emergency has passed.

## REGISTRATION AND HELP DESKS

### Registration Desk Information

The Registration Desk will be located in the Hall C Lobby, Sunday through Wednesday, from 7:00 a.m. to 6:00 p.m. On Thursday, the registration desk will be located on the second floor near the Programming Desk, from 7:00 a.m. to 6:00 p.m.

*Please note that tickets to receptions, luncheons, and other social and networking events **will not** be sold on-site at the TMS2022 registration desk this year.*

### Registration Badges

The TMS2022 name badge you received at registration must be worn for admission to technical sessions, the exhibition hall, social functions, and other events. Your full-meeting registration badge provides you access to:

- More than 90 symposia in 14 technical tracks
- Technical programming for three co-located events:
  - Fourth Summit on Diversity in the Minerals, Metals, and Materials Profession (DMMM4)
  - Furnace Tapping 2022
  - REWAS 2022
- All-conference plenary session, featuring Jim Yurko, Apple Materials Engineering
- A three-day pass to the TMS2022 Exhibition, which includes:
  - Exhibit Hall Opening Reception and Poster Session
  - Exhibit Hall Happy Hour and Poster Session
- Access to the Welcome Back Reception on Sunday night and Welcome Breakfast on Monday morning
- 2022 TMS-AIME Awards Ceremony
- Online access to the complete published TMS2022 conference proceedings
- Access to recorded presentations from all participating presenters available March 14.

Attached to your name badge, you will find tickets to attend the events and receptions listed above. Any additional luncheon or social function tickets that you purchased in advance will also be attached to your badge.

**Tickets for events, luncheons, and social functions are attached to your registration name badge.**

**On Thursday, the registration desk will move to the second floor of the Anaheim Convention Center.**

### Badge and Ticket Replacement

Please keep your badge and tickets with you at all times during the meeting. If you misplace your badge and tickets, replacement badges and tickets can be printed at the TMS2022 registration desk for a fee of \$25.

### Help Desks

For additional assistance during TMS2022, visit the following information booths on the second floor of the Anaheim Convention Center.

### TMS Member Welcome Center

Visit the TMS Member Welcome Center to learn more about your TMS membership or your Material Advantage student membership, as well as to answer general questions about TMS2022. Not a member? If you registered for TMS2022 at the non-member in-person registration rate, one year of TMS membership is included with your registration. Find out how you can use your new membership by visiting the booth and viewing the membership information found starting on page 53 of this guide.

The TMS Member Welcome Center is open Sunday through Thursday from 7:00 a.m. to 6:00 p.m. and is located near room 210 on the second floor of the Anaheim Convention Center.

### TMS2022 App Help Desk

The TMS2022 mobile application will be a valuable tool in navigating the meeting. Get help with downloading and using the app at the help desk, located near room 205 on the second floor of the convention center. The App Help Desk is open Sunday through Wednesday, from 7:00 a.m. to 6:00 p.m. On Thursday, it converts to the second floor Registration Desk.

### Programming Desk

Speakers, organizers, and session chairs can find answers to their questions about technical programming at the Programming Desk, located near room 207 on the second floor of the Anaheim Convention Center. The Programming Desk will be open on Sunday from 2:00 p.m. to 6:00 p.m. and Monday through Thursday from 7:00 a.m. to 6:00 p.m.

## Connect to Wi-Fi

### Anaheim Convention Center



For your convenience, free wireless internet access will be available in all areas of the Anaheim Convention Center.

#### To access free Wi-Fi in the Convention Center:

Choose Network: Anaheim Free WiFi  
No password needed

### Anaheim Marriott

You can access free Wi-Fi in the public spaces of the Anaheim Marriott; no password is required. All TMS2022 attendees staying at the Anaheim Marriott will receive free Wi-Fi in their sleeping rooms.

## Water Fill Stations

The Anaheim Convention Center has installed a total of 30 water bottle fill stations throughout the facility for your reusable water bottles.

## Concession Locations

The following concession areas are located in the Anaheim Convention Center for coffee and quick meal and snack options:

### Java City

**Location:** ACC, Outside Hall C (Lobby)

### Concession Stand C

**Location:** ACC, Inside Hall C

### Eco Grounds

**Locations:** ACC North, Second Floor Walkway and Main Lobby

## Cashless Transactions Only

The Anaheim Convention Center has gone cashless. Only credit or debit cards, Apple Pay, and Google Pay will be accepted at locations that require payment, such as parking and food stand locations. Additionally, all ATMs in the lobbies have been removed.

## Wear Your Pin Proudly!

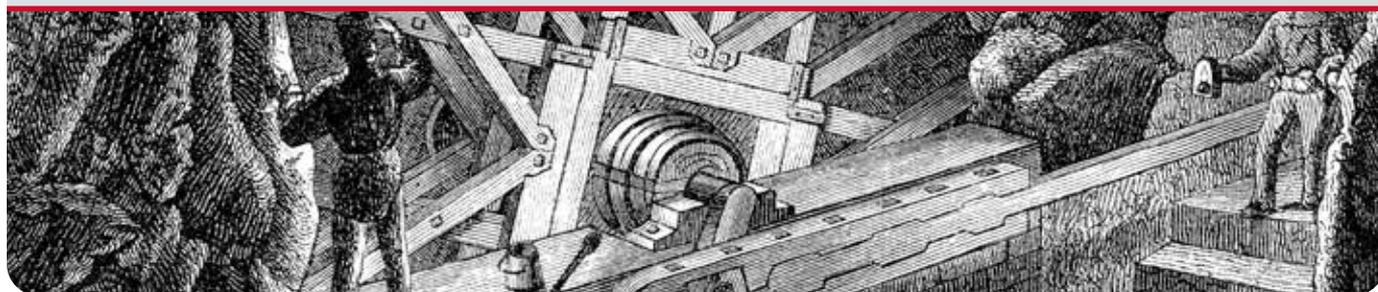
### Help Us Celebrate 150 Years of Convening the Minerals, Metals, and Materials Community

TMS's origins as a professional society date back to 1871 with the founding of its parent society, The American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME). That same year, the institute held its first annual meeting, where members presented technical papers, elected officers, and went on site visits. This marked the first installment of the organization's annual meeting—and the inaugural version of the TMS Annual Meeting.

Throughout 2021 and 2022, TMS is celebrating its shared history with AIME and 150 years of bringing our community together.

Learn more at:

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



# PROCEEDINGS INFORMATION

## Free Proceedings Access

TMS2022 attendees in most registration classes receive free online access to the complete collection of proceedings publications. For details on how to download the proceedings publications, see the instructions attached to your name badge. Please note that complimentary proceedings content must be downloaded by April 30, 2022, at which time standard pricing will take effect.

## Individual Volumes for Purchase

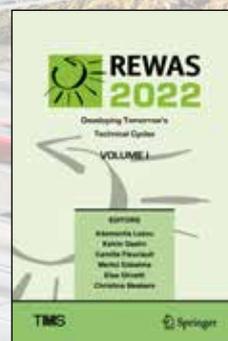
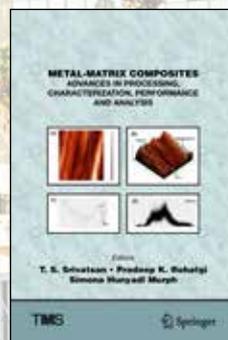
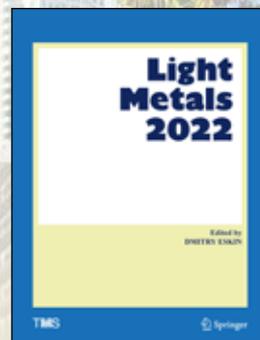
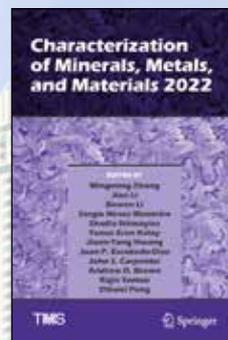
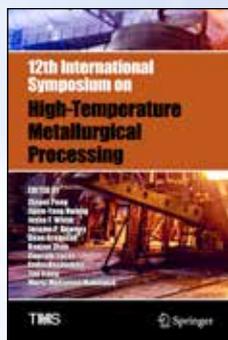
TMS members receive a 40% discount off hard copies of the TMS2022 proceedings volumes presented on this page. These books will be available for purchase at the Springer booth, located on the second floor of the Anaheim Convention Center, near room 202. Visit the online TMS Bookstore to search the complete inventory of available TMS publications, including past proceedings volumes.

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

## TMS2022 Proceedings Volumes

The following volumes will be included in the online proceedings access for most registrants, and hard copies will be available for purchase at TMS2022:

- *12th International Symposium on High-Temperature Metallurgical Processing*
- *Characterization of Minerals, Metals, and Materials 2022*
- *Furnace Tapping 2022*
- *Light Metals 2022*
- *Magnesium Technology 2022*
- *Metal-Matrix Composites: Advances in Processing, Characterization, Performance and Analysis*
- *Rare Metal Technology 2022*
- *REWAS 2022: Developing Tomorrow's Technical Cycles (Volume I)*
- *REWAS 2022: Energy Technologies and CO<sub>2</sub> Management (Volume II)*
- *TMS 2022 151st Annual Meeting & Exhibition Supplemental Proceedings*



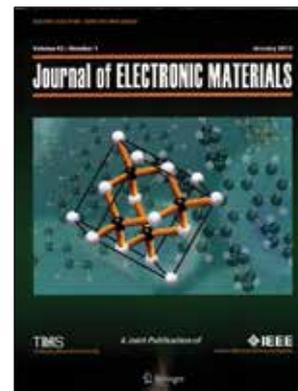
 Complimentary proceedings content must be downloaded by April 30, 2022.

# TMS

The Minerals, Metals & Materials Society

## A World of Knowledge at Your Fingertips READ TMS JOURNALS

Free online access to all TMS members!



TMS members also have free electronic access to 20 additional materials-related journals offered by TMS's publishing partner, Springer.



Log in at [www.tms.org/journals](http://www.tms.org/journals)

## Meeting Badges

All attendees must wear registration badges at all times during the meeting to ensure admission to events included in the paid registration fee, such as technical sessions, exhibition, and receptions. "Exhibit Only" badges only provide admittance to the show floor for events in the exhibit hall. "Exhibit Only" attendees may not attend technical sessions.

## Badge Ticket and Replacement Fee

There is a \$25 fee to reprint lost badges and tickets. Visit the registration area to request a replacement badge.

## Guest Session and Function Access

Each full-conference attendee is permitted up to two guests for one session at which they are presenting. This does not include colleagues or exhibitors. This access is intended for family members who wish to listen to one talk presented by their relative. Please provide the names of the guests who will be attending your presentations when picking up your badge, so that your guests receive a ticket that allows them entry to your session. If your guest is under the age of 18, please refer to the TMS Policy on Minor Children at Events. Guests must follow all meeting policies, including the Meetings Code of Conduct and must provide proof of vaccination or a negative COVID-19 test prior to entering the conference.

## Minor Children at Events

In accordance with the TMS Policy on Minor Children at Events, no one under the age of 18 will be allowed on the exhibit floor, with the exception of Material Advantage or other university student registrants and nursing babies with their mothers. View the full policy at [www.tms.org/CodeofConductPolicies](http://www.tms.org/CodeofConductPolicies).

## Refund Policy

The deadline for all refunds was January 18, 2022. No refunds will be issued at the meeting. Fees and tickets are nonrefundable. TMS is not responsible for "no-show" presenters. Presenters are scheduled and advertised in good faith, based on the presenter's proposal to be included in the program.

## Photography Policy

By registering for this meeting, all attendees acknowledge that they may be photographed by TMS personnel while at events, and that those photos may be used for promotional purposes, in TMS publications and websites, and on social media sites.

## TMS Diversity and Inclusion Statement

The Minerals, Metals & Materials Society (TMS) is committed to advancing diversity in the minerals, metals, and materials professions, and to promoting an inclusive professional culture that welcomes and engages all who seek to contribute to the field. TMS recognizes that a diverse minerals, metals, and materials workforce is critical to ensuring that all viewpoints, perspectives, and talents are brought to bear in addressing complex science and engineering challenges. To build and nurture this diverse professional community, TMS welcomes and actively engages the participation of underrepresented groups in all of its initiatives and endeavors.

## Meetings Code of Conduct

TMS is committed to providing a safe, inclusive, and welcoming environment for all attendees. For this reason, TMS does not tolerate harassment in any form and requires all participants to abide by TMS policies, including the Meetings Code of Conduct and Anti-Harassment Policy. For more information, or to report violations of these policies, go to [www.tms.org/CodeofConductPolicies](http://www.tms.org/CodeofConductPolicies) or see a TMS staff member.

## Antitrust Compliance Policy

TMS complies with the antitrust laws of the United States. Attendees are encouraged to consult with their own corporate counsel for further guidance in complying with U.S. and foreign antitrust laws and regulations.

## Americans with Disabilities Act



TMS strongly supports the federal Americans with Disabilities Act (ADA) which prohibits discrimination against, and promotes public accessibility for, those with disabilities. In support of, and in compliance with ADA, we ask those requiring specific equipment or services to notify TMS staff at the TMS Member Welcome Center or the Registration desk.

## Cell Phone Use



In consideration of attendees and presenters, TMS requests that you set cell phones and other devices on "silent" while in meeting rooms.

## Recording of Slides and Presentations



TMS reserves the right to all audio and video reproductions of presentations at TMS-sponsored meetings. Any recording of sessions (audio, video, still photography, etc.) intended for personal use, distribution, publication, or copyright without the express written consent of TMS and the individual authors is strictly prohibited. Attendees violating this policy may be asked to leave the session or the meeting without refund.

Meet the 2021-2022 TMS Board of Directors

**Officers**

**2021 TMS President**



Ellen Cerreta  
Division Leader, Los Alamos National Laboratory

**2021 Vice President/Incoming 2022 President**



W. Jud Ready  
Principal Research Engineer, Georgia Institute of Technology

**Incoming 2022 Vice President**



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

**Past President**



Thomas Battle  
Extractive Metallurgy Consultant

**Financial Planning Officer**



Charles H. Ward  
Chief of the Manufacturing and Industrial Technologies Division, U.S. Air Force Research Laboratory's Materials and Manufacturing Directorate

**TMS Secretary (non-voting)**



James J. Robinson  
Executive Director, TMS

**Functional Area Directors**

**Content Development & Dissemination Director/Chair**



Judith Schneider  
Professor, University of Alabama at Huntsville

**Membership & Student Development Director/Chair**



Alexis C. Lewis  
Deputy Division Director, National Science Foundation

**Incoming Membership & Student Development Director/Chair**



Viola L. Acoff  
Associate Dean, Undergraduate and Graduate Programs, College of Engineering, The University of Alabama

**Professional Development Director/Chair**



David L. Bourell  
Temple Foundation Professor of Mechanical Engineering, The University of Texas at Austin

**Programming Director/Chair**



Timothy Rupert  
Associate Professor, University of California, Irvine

**Public & Governmental Affairs Director/Chair**



Eric N. Brown  
Executive Advisor, Los Alamos National Laboratory

**Technical Division Directors**

**Extraction & Processing Division Director/Chair**



Christina Meskers  
Senior Advisor, Norwegian University of Science and Technology

**Functional Materials Division Director/Chair**



Paul Ohodnicki  
Associate Professor, University of Pittsburgh

**Light Metals Division Director/Chair**



Eric Nyberg  
Technology Development Manager, Tungsten Heavy Powder & Parts

**Incoming Light Metals Division Director/Chair**



Edward Williams  
Manager, Molten Metal Group, Arconic Technology Center

**Materials Processing & Manufacturing Division Director/Chair**



Mark R. Stoudt  
Materials Research Engineer, National Institute of Standards and Technology

**Incoming Materials Processing & Manufacturing Division Director/Chair**



Paul Mason  
President, Thermo-Calc Software Inc.

**Structural Materials Division Director/Chair**



Daniel Miracle  
Senior Scientist, Air Force Research Laboratory

**Incoming Structural Materials Division Director/Chair**



Suveen Mathaudhu  
Professor, Colorado School of Mines

## TMS2022 All-Conference Plenary

The TMS2022 All-Conference Plenary session offers an opportunity for all annual meeting attendees to come together for a shared presentation of common interest.

### “Alloy Design at Apple”

**Date:** Tuesday, March 1, 2022

**Time:** Noon to 1:00 p.m.

**Location:** Ballroom ABCD, Anaheim Convention Center, Third Floor

### About the Presentation

Apple products are recognized for their iconic industrial design and innovative performance, as well as the significant manufacturing scale to produce them for their customers globally. Materials innovation plays a central role in this success. In the last ten years, Apple has built an impressive materials engineering team focused on the design and application of new materials and engineered surfaces. Remarkably, this new materials development occurs within the rapid timescale of Apple product design and with an emphasis on reduced environmental impact.

On the Apple Alloy Engineering team, materials design is accelerated by the use of integrated computational materials engineering (ICME) approaches, improved characterization techniques, and rapid experimental feedback to inform design. This talk highlights Apple materials innovations that utilize these materials design methods.

### About the Presenter

As part of Apple's Product Design Materials Engineering group, Jim Yurko leads the Alloy Engineering Team, which is responsible for alloy design and engineered surface development of all Apple products. From the most recent materials and surface finishes of iPhone to the launch of highly recycled aluminum alloys on Macbook, iPad, and Watch, the Alloy Team's contributions emphasize performance, cosmetics, and environmental impact of these iconic products using industry-leading accelerated materials design methodologies.

Prior to joining Apple in 2015, he served as Vice President of Technology at Materion Corporation and co-founded Boston Electrometallurgical Corporation (now Boston Metal) in 2012.

Yurko's career has focused on materials design and application, as well as process development and sustainability in a number of materials systems including aluminum, stainless steel, titanium, magnesium, zirconium-bulk metallic glasses, and beryllium.

An active TMS member, Yurko served previously as chair of the Process Technology and Modeling Committee and received the Vittorio de Nora Prize for Environmental Improvements in Metallurgical Industries in 2012, the Brimacombe Medal in 2016, and the TMS Young Leader Award in 2010. In addition, Yurko is a recognized supporter of the TMS Foundation. He earned his B.S.E. from the University of Michigan and Ph.D. from Massachusetts Institute of Technology, both in Materials Science and Engineering.



### Featured Speaker

**Jim Yurko**

Senior Distinguished Engineer  
Apple Materials Engineering

# The Future Depends on You



*Join us as the TMS Foundation works to expand scholarships, Family Care Grants, and early career support in the minerals, metals, and materials science and engineering community.*

“

The TMS Family Care Grant supported the advancement of my career during the challenging years of having young children. I was able to attend the TMS annual meeting and bring my young daughter and afford to bring a caregiver along to the conference. Thank you for offering these travel grants.

”

—**Elaine West**,  
Naval Nuclear Laboratory  
*TMS Family Care Grant Recipient*



Stop by the TMS Member Welcome Center, located on the second floor of the Anaheim Convention Center, to learn more about the TMS Foundation.

You can also visit [www.TMSFoundation.org/Contribute](http://www.TMSFoundation.org/Contribute) to make an online donation.

[www.TMSFoundation.org](http://www.TMSFoundation.org)

# CALENDAR OF EVENTS

Event/Function Times are in Pacific Standard Time (UTC-8:00).  
Event information is current as of February 17, 2022

Event/Function Name	Start Time	End Time	Venue	Location	Access
<b>Sunday, February 27, 2022</b>					
<b>All-Conference Events</b>					
COVID Checkpoint	7:00 a.m.	8:00 p.m.	ACC	Ticket Booth	O
Registration	7:00 a.m.	8:00 p.m.	ACC	Hall C Lobby	O
Member Welcome Center	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 210	O
App Support Desk	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 205	O
Springer Nature Publications Booth	8:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 202	O
First Aid	7:00 p.m.	8:00 p.m.	ACC	1st Floor – Front of Hall B	O
Programming Support Desk	2:00 p.m.	6:00 p.m.	ACC	2nd Floor - Near Room 207	O
<b>Council and Functional Committee Meetings*</b>					
TMS Board of Directors' Meeting	7:30 a.m.	1:00 p.m.	MAR	Grand Ballroom F	I
Accreditation Committee Meeting	12:30 p.m.	2:30 p.m.	MAR	Los Angeles - LL	O
TMS Nominating Committee Meeting	1:30 p.m.	3:30 p.m.	MAR	Grand Ballroom J	R
TMS Program Committee Meeting	4:00 p.m.	6:00 p.m.	MAR	OC Ballroom 1-2	I
Frontiers of Materials Subcommittee	6:00 p.m.	7:00 p.m.	MAR	OC Ballroom 1-2	I
<b>Exhibition</b>					
Exhibitor Move-in	8:00 a.m.	5:00 p.m.	ACC	Hall C	R
<b>Student and Young Professional Functions</b>					
Bladesmithing Competition: Blade Check In	12:00 p.m.	5:00 p.m.	ACC	Hall C	I
TMS Materials Bowl: Escape to Anaheim	5:00 p.m.	7:00 p.m.	MAR	Platinum Ballroom 6	O
Student Networking Mixer	7:00 p.m.	8:30 p.m.	MAR	Grand Ballroom E	O
<b>Social Functions</b>					
TMS Fellows and Invited Guests Reception	4:30 p.m.	6:30 p.m.	MAR	Grand Ballroom A	I
Welcome Back Reception/Division Networking	7:00 p.m.	8:00 p.m.	ACC	Ballroom ABCD - 3rd Floor	O
LGBTQ+ and Allies Mixer	8:00 p.m.	10:00 p.m.	MAR	Grand Ballroom G-H	O
<b>Other</b>					
ABET Preparation Training	3:00 p.m.	5:00 p.m.	MAR	Los Angeles - LL	O
<b>Monday, February 28, 2022</b>					
<b>All-Conference Events</b>					
COVID Checkpoint	7:00 a.m.	6:00 p.m.	ACC	Ticket Booth	O
Registration	7:00 a.m.	6:00 p.m.	ACC	Hall C Lobby	O
Member Welcome Center	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 210	O
Programming Support Desk	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 207	O
App Support Desk	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 205	O
First Aid	7:00 a.m.	7:00 p.m.	ACC	1st Floor – Front of Hall B	O
Monday Morning Breakfast	7:00 a.m.	8:30 a.m.	ACC	Hall C	O
Springer Nature Publications Booth	8:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 202	O
Technical Programming Sessions	8:30 a.m.	12:00 p.m.	ACC	Various	O
Morning Break	9:50 a.m.	10:30 a.m.	ACC	Various	O
Technical Programming Sessions	2:00 p.m.	5:30 p.m.	ACC	Various	O
Afternoon Break	3:20 p.m.	4:00 p.m.	ACC	Various	O

## You Are Invited: Attend a Technical Committee Meeting at TMS2022

Attend one of our open technical committee meetings this week to meet colleagues with similar technical interests and to become an engaged member of the TMS community. View a complete listing of committee meetings on page 26 for times and locations.

ACC

Anaheim Convention Center

MAR

Anaheim Marriott

O = Open to All Attendees R = Restrictions Apply T = Ticketed Event, Pre-registration required I = Invitation Only W = On your Own

\* A schedule of TMS Technical Committee Meetings can be found on page 26 of this conference guide.

Event/Function Name	Start Time	End Time	Venue	Location	Access
<b>Council and Functional Committee Meetings*</b>					
Membership and Student Development Committee	7:30 a.m.	9:30 a.m.	MAR	Grand Ballroom B	I
Executive Committee Meeting	9:15 a.m.	11:00 a.m.	MAR	Grand Ballroom A	I
Extraction & Processing Division Council Meeting #1	12:00 p.m.	2:00 p.m.	MAR	Marquis Ballroom NW	I
Ad Hoc Division Structures Committee Meeting	4:00 p.m.	6:00 p.m.	MAR	Grand Ballroom C	I
Financial Planning Committee Meeting	2:00 p.m.	4:00 p.m.	MAR	Grand Ballroom A	R
Superalloys 2024 Organizing Committee Meeting	5:30 p.m.	7:00 p.m.	MAR	Grand Ballroom B	I
Light Metals Division	6:00 p.m.	7:30 p.m.	MAR	Grand Ballroom G&H	I
<b>Exhibition</b>					
Exhibitor Move-in	8:00 a.m.	10:00 a.m.	ACC	Hall C	R
Poster Session I Installation	12:00 p.m.	2:00 p.m.	ACC	Hall C	O
TMS2022 Exhibition	11:00 a.m.	7:00 p.m.	ACC	Hall C	O
Concession Stands Open in Exhibit Hall	11:00 a.m.	3:00 p.m.	ACC	Hall C	W
Poster Session I Gallery Viewing	2:00 p.m.	5:30 p.m.	ACC	Hall C	O
Exhibit Opening Reception and Poster Presentations	5:30 p.m.	7:00 p.m.	ACC	Hall C	O
Poster Session I Dismantle	7:00 p.m.	7:30 p.m.	ACC	Hall C	O
<b>Student and Young Professional Functions</b>					
TMS President Breakfast with Young Leader Award Recipients	7:30 a.m.	8:30 a.m.	MAR	Grand Ballroom D	I
Bladesmithing Competition Display	11:00 a.m.	7:00 p.m.	ACC	Hall C	O
Technical Division Student Poster Contest	5:00 p.m.	7:00 p.m.	ACC	Hall C	O
<b>Social Functions</b>					
SMD/FMD Luncheon	12:00 p.m.	1:30 p.m.	ACC	Ballroom E - 3rd Floor	T
TMS Past Presidents Luncheon and Meeting	12:00 p.m.	1:30 p.m.	MAR	Grand Ballroom D	I
PubZone Networking Reception	6:00 p.m.	7:30 p.m.	MAR	Platinum Patio	T
<b>Other</b>					
Leadership Development Networking Event	5:00 p.m.	7:00 p.m.	MAR	OC Ballroom 1-2	I
<b>Tuesday, March 1, 2022</b>					
<b>All-Conference Events</b>					
COVID Checkpoint	7:00 a.m.	6:00 p.m.	ACC	Ticket Booth	O
Registration	7:00 a.m.	6:00 p.m.	ACC	Hall C Lobby	O
Member Welcome Center	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 210	O
Programming Support Desk	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 207	O
App Support Desk	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 205	O
First Aid	7:00 a.m.	7:00 p.m.	ACC	1st Floor - Front of Hall B	O
Technical Programming Sessions	8:00 a.m.	11:30 a.m.	ACC	Various	O
Springer Nature Publications Booth	8:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 202	O
Morning Break	9:20 a.m.	10:00 a.m.	ACC	Various	O
All-Conference Plenary	12:00 p.m.	1:00 p.m.	ACC	Ballroom ABCD - 3rd Floor	O
Technical Programming Sessions	2:30 p.m.	6:00 p.m.	ACC	Various	O
Afternoon Break	3:50 p.m.	4:30 p.m.	ACC	Various	O
<b>Council and Functional Committee Meetings*</b>					
DMMM4 Organizing Committee Meeting	7:00 a.m.	8:00 a.m.	MAR	Grand Ballroom B	I
Extraction & Processing Division Council Meeting #2	7:00 a.m.	8:30 a.m.	MAR	Marquis Ballroom NW	I
REWAS Organizing Committee Meeting	7:15 a.m.	8:15 a.m.	MAR	Grand Ballroom C	I
Education Committee Meeting	7:30 a.m.	9:00 a.m.	MAR	La Jolla / Los Angeles LL	O
TMS Foundation Board of Trustees' Meeting	7:30 a.m.	10:00 a.m.	MAR	Grand Ballroom G-H	I
Young Professionals Committee Meeting	8:00 a.m.	9:30 a.m.	MAR	Marquis Ballroom NorthEast	O
Honors and Professional Recognition Committee Meeting	8:30 a.m.	9:30 a.m.	MAR	Grand Ballroom A	R

**ACC** Anaheim Convention Center      **MAR** Anaheim Marriott

**O** = Open to All Attendees    **R** = Restrictions Apply    **T** = Ticketed Event, Pre-registration required    **I** = Invitation Only    **W** = On your Own

\* A schedule of TMS Technical Committee Meetings can be found on page 26 of this conference guide.

# CALENDAR OF EVENTS

Event/Function Times are in Pacific Standard Time (UTC-8:00).  
Event information is current as of February 17, 2022

Event/Function Name	Start Time	End Time	Venue	Location	Access
TMS-KIM Leadership Meeting	10:00 a.m.	11:00 a.m.	MAR	Desert Springs LL	I
Structural Materials Division Council Meeting	1:00 p.m.	2:00 p.m.	MAR	Grand Ballroom J&K	I
Public and Governmental Affairs Committee	1:00 p.m.	3:00 p.m.	MAR	Grand Ballroom A	O
TMS PRIDE Meeting	3:00 p.m.	4:00 p.m.	MAR	Grand Ballroom B	O
Materials Processing & Manufacturing Division Council	6:00 p.m.	7:30 p.m.	MAR	Grand Ballroom J&K	I
<b>Exhibition</b>					
TMS2022 Exhibition	11:00 a.m.	7:00 p.m.	ACC	Hall C	O
Concession Stands Open in Exhibit Hall	11:00 a.m.	3:00 p.m.	ACC	Hall C	O
Poster Session II Installation	12:00 p.m.	2:00 p.m.	ACC	Hall C	O
Poster Session II Gallery Viewing	2:00 p.m.	5:30 p.m.	ACC	Hall C	O
Exhibit Hall Happy Hour and Poster Presentations	5:30 p.m.	7:00 p.m.	ACC	Hall C	O
Poster Session II Dismantle	7:00 p.m.	7:30 p.m.	ACC	Hall C	O
<b>Student and Young Professional Functions</b>					
Bladesmithing Competition Display	11:00 a.m.	7:00 p.m.	ACC	Hall C	O
Young Professionals Tutorial Luncheon	1:00 p.m.	2:15 p.m.	MAR	Marquis Ballroom NorthEast	O
Student Career Forum	2:15 p.m.	4:15 p.m.	MAR	Platinum Ballrom 9-10	O
Preparing A Winning Application Package Workshop	4:15 p.m.	6:15 p.m.	MAR	OC Ballroom 1-2	O
Bladesmithing Competition: Awards Presentation	5:00 p.m.	5:30 p.m.	MAR	Platinum Ballroom 6	O
<b>Social Functions</b>					
EPD/MPMD Luncheon	1:00 p.m.	2:30 p.m.	ACC	Ballroom E - 3rd Floor	T
Frontiers of Materials Reception	5:00 p.m.	6:00 p.m.	ACC	260C	I
Diran Apelian Honorary Symposium Reception	5:30 p.m.	7:00 p.m.	MAR	Marquis Ballroom NorthWest	T
DMMM4 Preview and Networking Mixer	6:30 p.m.	8:00 p.m.	MAR	OC Ballroom	O
<b>Other</b>					
Pre-Registered COVID Testing	By Appointment		ACC	205B	I
<b>Wednesday, March 2, 2022</b>					
<b>All-Conference Events</b>					
COVID Checkpoint	7:00 a.m.	6:00 p.m.	ACC	Ticket Booth	O
Registration	7:00 a.m.	6:00 p.m.	ACC	Hall C Lobby	O
Member Welcome Center	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 210	O
Programming Support Desk	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 207	O
App Support Desk	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 205	O
First Aid	7:00 a.m.	6:00 p.m.	ACC	1st Floor - Front of Hall B	O
Springer Nature Publications Booth	8:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 202	O
Technical Programming Sessions	8:30 a.m.	12:00 p.m.	ACC	Various	O
DMMM4 All-Summit Keynote Session	8:30 a.m.	12:00 p.m.	MAR	Grand Ballroom F	O
Morning Break	9:50 a.m.	10:30 a.m.	ACC	Various	O
Technical Programming Sessions	2:00 p.m.	5:30 p.m.	ACC	Various	O
Afternoon Break	3:20 p.m.	4:00 p.m.	ACC	Various	O
<b>Council and Functional Committee Meetings*</b>					
API Working Group	12:00 p.m.	1:00 p.m.	MAR	Grand Ballroom B	I
Functional Materials Division Council Meeting	12:00 p.m.	1:30 p.m.	MAR	Grand Ballroom G&H	I
International Affairs Committee Meeting	12:00 p.m.	2:00 p.m.	MAR	Grand Ballroom A	I
<b>Exhibition</b>					
TMS2022 Exhibition	10:00 a.m.	2:00 p.m.	ACC	Hall C	O
Concession Stands Open in Exhibit Hall	11:00 a.m.	3:00 p.m.	ACC	Hall C	W
Exhibitor Move-Out	2:00 p.m.	8:00 p.m.	ACC	Hall C	R
<b>Student and Young Professional Functions</b>					
Bladesmithing Competition Display	10:00 a.m.	2:00 p.m.	ACC	Hall C	O
Bladesmithing Competition: Mandatory Blade Check Out	2:00 p.m.	3:00 p.m.	ACC	Hall C	R

ACC

Anaheim Convention Center

MAR

Anaheim Marriott

O = Open to All Attendees R = Restrictions Apply T = Ticketed Event, Pre-registration required I = Invitation Only W = On your Own

\* A schedule of TMS Technical Committee Meetings can be found on page 26 of this conference guide.

Event/Function Name	Start Time	End Time	Venue	Location	Access
<b>Social Functions</b>					
Fresh Coffee, Fresh Ideas: Diversity and Inclusion Breakfast	7:00 a.m.	8:15 a.m.	MAR	OC Ballroom	T
LMD Luncheon	12:00 p.m.	1:30 p.m.	ACC	Ballroom E - 3rd Floor	T
TMS-AIME Awards Ceremony Reception	5:30 p.m.	6:00 p.m.	MAR	Platinum Ballroom 7-9	O
TMS-AIME Awards Ceremony	6:00 p.m.	7:30 p.m.	MAR	Platinum Ballroom 6	O
TMS-AIME Awards Celebration Dinner and Dessert Party	7:30 p.m.	10:00 p.m.	MAR	Platinum Ballroom 5	T
<b>Other</b>					
DMMM4 Networking Zone	7:00 a.m.	5:00 p.m.	MAR	OC Ballroom	O
Pre-Registered COVID Testing	By Appointment		ACC	205B	I
<b>Thursday, March 3, 2022</b>					
<b>All-Conference Events</b>					
COVID Checkpoint	7:00 a.m.	6:00 p.m.	ACC	Ticket Booth	O
Registration	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 205	O
Member Welcome Center	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 210	O
Programming Support Desk	7:00 a.m.	6:00 p.m.	ACC	2nd Floor - Near Room 207	O
First Aid	7:00 a.m.	6:00 p.m.	ACC	1st Floor - Front of Hall B	O
Springer Nature Publications Booth	8:00 a.m.	1:00 p.m.	ACC	2nd Floor - Near Room 202	O
Technical Programming Sessions	8:30 a.m.	12:00 p.m.	ACC	Various	O
Morning Break	9:50 a.m.	10:30 a.m.	ACC	Various	O
DMMM4 All-Summit Closing Plenary	2:00 p.m.	4:30 p.m.	MAR	Grand Ballroom F	O
Technical Programming Sessions	2:00 p.m.	5:30 p.m.	ACC	Various	O
Afternoon Break	3:20 p.m.	4:00 p.m.	ACC	Various	O
<b>Council and Functional Committee Meetings*</b>					
TMS Annual Meeting of the Membership and Open Board of Directors' Meeting	8:00 a.m.	8:30 a.m.	MAR	Grand Ballroom A-B	O
<b>Social Functions</b>					
DMMM4 Celebrate Diversity Luncheon	12:00 p.m.	2:00 p.m.	MAR	OC Ballroom	T
<b>Other</b>					
DMMM4 Networking Zone	8:00 a.m.	5:00 p.m.	MAR	OC Ballroom	O
Pre-Registered COVID Testing	By Appointment		ACC	205B	I

## Announcing the 2022 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 2022 Annual Meeting of the Membership with an open Board of Directors Meeting, on Thursday, March 3, 2022, from 8:00 a.m. to 8:30 a.m. (Pacific Standard Time) in Grand Ballroom A-B of the Anaheim Marriott during the TMS 2022 Annual Meeting & Exhibition. *All TMS members are welcome to attend this meeting.*

ACC Anaheim Convention Center      MAR Anaheim Marriott

O = Open to All Attendees    R = Restrictions Apply    T = Ticketed Event, Pre-registration required    I = Invitation Only    W = On your Own

\* A schedule of TMS Technical Committee Meetings can be found on page 26 of this conference guide.

# TECHNICAL COMMITTEE MEETINGS

Event/Function Times are in Pacific Standard Time (UTC-8:00).  
Event information is current as of February 17, 2022

The following technical committee meetings are open to all TMS members to attend. Select the meeting that best matches your interest area and plan to join in. Please note that some TMS technical committees met virtually prior to TMS2022. You can learn more about all of our committees at [www.tms.org/Committees](http://www.tms.org/Committees).

## Sunday, February 27, 2022

Committee Name	Meeting Time	Room
Magnesium Committee	1:30 p.m. to 3:00 p.m.	Marriott - Grand Ballroom B-C
Recycling & Environmental Technologies Committee	1:30 p.m. to 3:00 p.m.	Marriott - OC Ballroom 1-2
Pyrometallurgy Committee	3:00 p.m. to 4:30 p.m.	Marriott - OC Ballroom 3-4
Process Technology & Modeling Committee	5:00 p.m. to 6:00 p.m.	Marriott - OC Ballroom 3-4
Additive Manufacturing Committee	5:30 p.m. to 7:00 p.m.	Marriott - Platinum Ballroom 9-10
Nanomechanical Materials Behavior Committee	6:00 p.m. to 7:30 p.m.	Marriott - Platinum Ballroom 7-8
Alloy Phases Committee	7:30 p.m. to 9:00 p.m.	Marriott - Newport Beach / Rancho Las Palmas LL
Mechanical Behavior of Materials Committee	7:30 p.m. to 9:00 p.m.	Marriott - Platinum Ballroom 7-8
Phase Transformation Committee	7:30 p.m. to 9:00 p.m.	Marriott - Grand Ballroom B-C

## Monday, February 28, 2022

Integrated Computational Materials Engineering (ICME) Committee Meeting	1:15 p.m. to 2:30 p.m.	Marriott, Marquis Ballroom NorthEast
Powder Materials Committee	1:15 p.m. to 2:30 p.m.	Marriott, OC Ballroom 3-4
Biomaterials Committee	6:00 p.m. to 7:00 p.m.	Marriott, Marquis Ballroom NorthWest
Chemistry & Physics of Materials Committee	6:00 p.m. to 7:00 p.m.	Marriott, Grand Ballroom J-K
Nuclear Materials Committee	6:00 p.m. to 7:30 p.m.	Marriott, Marquis Ballroom NorthEast
Shaping & Forming Committee	6:00 p.m. to 7:30 p.m.	Marriott, OC Ballroom 3-4
Composite Materials Committee	6:30 p.m. to 7:30 p.m.	Marriott, Platinum Ballroom 7-8
Computational Materials Science and Engineering Committee Meeting 2	7:30 p.m. to 8:30 p.m.	Anaheim Convention Center, Room 254B

## Tuesday, March 1, 2022

Energy Conversion & Storage Committee	7:30 a.m. to 8:30 a.m.	Marriott, Newport Beach / Rancho Las Palmas LL
Electronic Packaging & Interconnection Materials Committee	Noon to 1:00 p.m.	Marriott, Grand Ballroom G-H
Solidification Committee	5:45 p.m. to 6:45 p.m.	Marriott, Platinum Ballroom 7-8
Corrosion and Environmental Effects Committee	6:00 p.m. to 7:00 p.m.	Marriott, Grand Ballroom G-H
Nanomaterials Committee	6:00 p.m. to 7:00 p.m.	Marriott, Newport Beach / Rancho Las Palmas LL
Titanium Committee	6:00 p.m. to 7:00 p.m.	Marriott, Grand Ballroom C-D
High Temperature Alloys Committee	6:00 p.m. to 7:30 p.m.	Marriott, Platinum Ballroom 9-10
Magnetic Materials Committee	7:00 p.m. to 8:00 p.m.	Marriott, Grand Ballroom C-D



PART OF:



VISIT THE

## 2022 TMS BLADESMITHING COMPETITION DISPLAY

Teams of university students rose to the challenge of forming a blade though hand hammering or trip hammer forging in the fourth TMS Bladesmithing Competition.

These blades, along with their accompanying poster and video submissions, are on display for your enjoyment in the Exhibit Hall, located in Hall C of the Anaheim Convention Center.

### EXPLORE THE COLLECTION DURING THE FOLLOWING HOURS:

Monday, February 28 • 11:00 a.m. to 7:00 p.m.

Tuesday, March 1 • 11:00 a.m. to 7:00 p.m.

Wednesday, March 2 • 10:00 a.m. to 2:00 p.m.

### AND THE WINNER IS...

The winning entries will be revealed on  
**Tuesday, March 1, at 5:00 p.m.** in the  
Platinum Ballroom 6, Anaheim Marriott.

*All TMS2022 registrants are welcome to attend.*

**Visit the Poster Sessions in the TMS2022 Exhibit Hall**

View a changing display of posters in the TMS2022 Exhibit Hall (Hall C) during exhibit hours. Then join us for two separate presentation sessions, grouped by topic areas, on Monday and Tuesday evening. Presenters will be on hand during these sessions to discuss their work.

**POSTER SESSION I**

Monday, February 28  
5:30 p.m. to 7:00 p.m.

**FEATURING POSTERS ON:**

Advanced Materials
Corrosion
Electronic Materials
Energy & Environment (including REWAS 2022 Symposia)
Light Metals
Materials Processing
Mechanics and Structural Reliability
Nanostructured & Heterostructured Materials

**POSTER SESSION II**

Tuesday, March 1  
5:30 p.m. to 7:00 p.m.

**FEATURING POSTERS ON:**

Additive Technologies
Biomaterials
Characterization
Materials Design
Nuclear Materials
Physical Metallurgy

**TMS 2022**  
**MATERIALS BOWL**  
ESCAPE TO ANAHEIM

**COME AND CHEER ON YOUR FAVORITE SCHOOL**  
at the updated TMS Materials Bowl, a gamified version of our traditional materials-themed knowledge and trivia competition. It takes place Sunday from 5:00 p.m. to 7:00 p.m. at the Anaheim Marriott, Platinum Ballroom 6.



*Current as of February 11, 2022*

# TECHNICAL PROGRAM AT A GLANCE

The following chart presents a general overview of symposium dates and locations at TMS2022. Symposia are presented by topic areas. Please check the TMS2022 App or the TMS2022 Technical Program web page for the most complete and up-to-date plans.

## TOPIC COLOR KEY:

ADDITIVE TECHNOLOGIES	MATERIALS PROCESSING	MECHANICS AND STRUCTURAL RELIABILITY
CORROSION	NUCLEAR MATERIALS	PHYSICAL METALLURGY
LIGHT METALS	CHARACTERIZATION	NANOSTRUCTURED & HETEROSTRUCTURED MATERIALS
ADVANCED MATERIALS	ELECTRONIC MATERIALS	ENERGY & ENVIRONMENT
BIOMATERIALS	MATERIALS DESIGN	SPECIAL TOPICS

## NOTICE REGARDING TECHNICAL PROGRAM CANCELLATIONS:

Changing the times of presentations is disruptive to the program and may cause delegates to miss valuable presentations. We have asked symposium organizers and session chairs not to adjust presentation times in the event that a speaker is unable to deliver his or her talk due to international travel and/or visa issues resulting in late cancellation or "no show."

# PROGRAM AT A GLANCE

Symposium Name	ROOM	MON AM	MON PM	POSTER	TUE AM	TUE PM	POSTER	WED AM	WED PM	THU AM	THU PM	ON DEMAND
		<b>Additive Manufacturing</b>										
Additive Manufacturing and Innovative Powder Processing of Functional and Magnetic Materials	262C						•	•	•	•	•	•
Additive Manufacturing Fatigue and Fracture: Developing Predictive Capabilities	258B				•	•	•	•	•	•	•	•
Additive Manufacturing for Energy Applications IV	261B	•			•		•	•				•
Additive Manufacturing Keynote Session	257		•									
Additive Manufacturing of Large-scale Metallic Components	263A				•	•	•		•			•
Additive Manufacturing of Refractory Metallic Materials	262C	•			•	•						•
Additive Manufacturing: Advanced Characterization with Synchrotron, Neutron, and In Situ Laboratory-scale Techniques II	258A	•			•	•		•	•	•		•
Additive Manufacturing: Beyond the Beam III	263B				•	•	•	•	•			•
Additive Manufacturing: Beyond the Beam III	263C	•										
Additive Manufacturing: Materials Design and Alloy Development IV: Rapid Development	261A	•			•	•	•	•	•	•		•
Additive Manufacturing: Nano/Micro-mechanics and Length-scale Phenomena	260A					•	•	•	•	•		•
Additive Manufacturing: Nano/Micro-mechanics and Length-scale Phenomena	204B										•	
Powder Materials Processing and Fundamental Understanding	263C		•		•	•	•	•	•			•
<b>Materials Processing</b>												
12th International Symposium on High Temperature Metallurgical Processing	213A		•	•								•
Advances in Powder and Ceramic Materials Science	213C	•	•	•	•	•						•
Advances in Surface Engineering IV	210C	•	•	•	•	•						•
Defects and Properties of Cast Metals IV	210B	•	•	•	•	•						•
Furnace Tapping 2022	213D	•	•			•						•
Furnace Tapping 2022	204B				•							
Materials Processing Fundamentals	213D			•				•	•			•
Powder Metallurgy of Light, Reactive and Other Non-ferrous Metals	211B		•									•
Rare Metal Extraction and Processing	213B	•	•									•
<b>Mechanics &amp; Structural Reliability</b>												
Deformation and Damage Mechanisms of High Temperature Alloys	263A										•	•
Deformation and Damage Mechanisms of High Temperature Alloys	304B	•	•	•	•	•		•	•			
Dynamic Behavior of Materials IX	263C									•	•	•
Dynamic Behavior of Materials IX	304D	•	•	•	•	•		•	•			
Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior	263B									•		•
Grain Boundaries and Interfaces: Metastability, Disorder, and Non-Equilibrium Behavior	304C	•	•	•	•	•		•	•			
Structural Metamaterials	304A	•	•	•	•	•						•
<b>Nuclear Materials</b>												
Advanced Characterization and Modeling of Nuclear Fuels: Microstructure, Thermo-physical Properties	202B	•	•		•	•	•	•	•			•
Materials and Chemistry for Molten Salt Systems	203B	•	•		•	•	•	•	•			•
Materials Systems for the Future of Fusion Energy	203A				•	•	•	•	•	•	•	•
Mechanical Behavior and Degradation of Advanced Nuclear Fuel and Structural Materials	204A	•	•		•	•	•	•	•		•	•
Synergistic Irradiation, Corrosion, and Microstructural Evolution in Nuclear Materials	202A				•	•	•	•	•	•		•

# PROGRAM AT A GLANCE

MON AM	MON PM	POSTER	TUE AM	TUE PM	POSTER	WED AM	WED PM	THU AM	THU PM	ON DEMAND
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Symposium Name	ROOM	MON AM	MON PM	POSTER	TUE AM	TUE PM	POSTER	WED AM	WED PM	THU AM	THU PM	ON DEMAND
<b>Physical Metallurgy</b>												
Computational Thermodynamics and Kinetics	255C	•	•		•	•	•	•	•	•	•	•
Phase Transformations and Microstructural Evolution	255B	•	•		•	•	•	•	•	•	•	•
<b>Light Metals</b>												
2022 Light Metals Keynote Session	204B	•										
Alumina & Bauxite	On-Demand Only											•
Aluminum Alloys, Processing and Characterization	208B		•	•	•	•			•			•
Aluminum Reduction Technology	209B					•				•		•
Aluminum Reduction Technology	211A		•									
Aluminum Reduction Technology Joint Session with REWAS: Decarbonizing the Metals Industry	210C				•							•
Cast Shop Technology	209A		•		•			•	•			•
Electrode Technology for Aluminum Production	208A		•		•	•						•
Failure, and a Career That is Anything But: An LMD Symposium Honoring J. Wayne Jones	209B		•		•							•
Magnesium Technology	210A	•		•	•			•		•	•	•
Primary Aluminum Industry - Energy and Emission Reductions: An LMD Symposium in Honor of Halvor Kvande	208A							•	•			•
Recycling and Sustainability in Cast Shop Technology: Joint Session with REWAS 2022	209A					•						•
<b>Characterization</b>												
Advanced Characterization Techniques for Quantifying and Modeling Deformation	207A	•	•		•	•		•	•	•	•	•
Advanced Real Time Imaging	206A	•			•	•	•	•				•
Characterization of Minerals, Metals and Materials 2022	207B	•	•		•	•	•	•		•		•
Mechanical Response of Materials Investigated Through Novel In-Situ Experiments and Modeling	206B	•	•		•		•	•	•	•	•	•
Seeing is Believing -- Understanding Environmental Degradation and Mechanical Response Using Advanced Characterization Techniques: An SMD Symposium in Honor of Ian M. Robertson	207C	•	•		•	•		•	•	•		•
<b>Nanostructured Materials</b>												
30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond	259A	•	•	•	•	•						•
30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond	259B								•		•	
30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond	204B									•		
Advances and Discoveries in Non-equilibrium Driven Nanomaterials and Thin Films	259B		•	•	•							•
Functional Nanomaterials: Functional Low-Dimensional (0D, 1D, 2D) Materials 2022	260B	•	•	•	•	•		•	•	•	•	•
Mechanical Behavior at the Nanoscale VI	262B	•	•	•	•	•		•		•		•
Mechanical Behavior at the Nanoscale VI	204B								•			
Self-organizing Nano-architected Materials	260C	•	•	•	•	•		•				•
Ultrafine-grained and Heterostructured Materials (UFGH XII)	262A	•	•	•	•	•		•	•	•		•
<b>Advanced Materials</b>												
2D Materials – Preparation, Properties & Applications	252C	•	•	•								•
Advanced Functional and Structural Thin Films and Coatings	204B					•						
Advanced Functional and Structural Thin Films and Coatings	252B			•				•	•	•		•
Advances in Multi-Principal Elements Alloys X: Alloy Development and Properties	251A	•	•			•		•	•	•	•	•

TECHNICAL PROGRAM AT A GLANCE

# PROGRAM AT A GLANCE

Symposium Name	ROOM	MON AM	MON PM	POSTER	TUE AM	TUE PM	POSTER	WED AM	WED PM	THU AM	THU PM	ON DEMAND
		Advances in Multi-Principal Elements Alloys X: Structures and Modeling	251B	.	.	.	.	.		.	.	.
Bulk Metallic Glasses XIX	253C		.	.	.	.		.		.	.	.
High Performance Steels	252C					.		.	.	.	.	.
Materials in Sport	251C	.										
Refractory Metals	252B	.	.		.							.
<b>Electronic Materials</b>												
Alloys and Compounds for Thermoelectric and Solar Cell Applications X	303D	.		.	.			.				.
Electronic Packaging and Interconnections	303B	.			.							.
Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXI	303A		.		.	.						.
Recent Advances in Printed Electronics and Additive Manufacturing: 2D/3D Functional Materials, Fabrication Processes, and Emerging Applications	303C	.	.	.	.	.						.
<b>Energy &amp; Environment (including REWAS 2022 Symposia)</b>												
Advanced Magnetic Materials for Sensors, Power, and Multifunctional Applications	213B								.	.	.	.
Advanced Materials for Energy Conversion and Storage 2022	212B	.	.	.	.	.		.	.	.		.
Composite Materials for Sustainable Eco-Friendly Applications	211A			.					.	.		.
Composites for Energy Applications: Materials for Renewable Energy Applications 2022	210D			.		.			.			.
Magnetics and the Critical Materials Challenge: An FMD Symposium Honoring Matthew J. Kramer	210D	.	.		.							.
REWAS 2022: Coupling Metallurgy and Sustainability: An EPD Symposium in Honor of Diran Apelian	204B		.									
REWAS 2022: Coupling Metallurgy and Sustainability: An EPD Symposium in Honor of Diran Apelian	211A				.	.						.
REWAS 2022: Energy Technologies and CO2 Management	212A	.			.							.
REWAS 2022: Plenary	204B		.									
REWAS 2022: Poster Session	Exhibit Hall C			.								
REWAS 2022: Recovering the Unrecoverable	211B					.						.
REWAS 2022: Sustainable Production and Development Perspectives	211B				.							.
REWAS 2022: Automation and Digitalization for Advanced Manufacturing	212A							.				.
REWAS 2022: Automation and Digitalization for Advanced Manufacturing	211B								.			
REWAS 2022: Decarbonizing the Materials Industry	212A					.			.			.
<b>Biomaterials</b>												
Advances in Biomaterials for 3D Printing of Scaffolds and Tissues	201A	.	.				.					
Biological Materials Science	201B	.	.		.	.		.				.
Biological Materials Science	204B							.				
BioNano Interfaces and Engineering Applications	201A				.	.	.	.	.			.
<b>Materials Design</b>												
Advances in Titanium Technology	252A		.		.	.	.	.	.	.		.
AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification	256A	.	.		.	.	.	.	.	.	.	.
Algorithm Development in Materials Science and Engineering	253A	.	.		.	.	.	.	.	.		.
Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling	254B	.	.		.	.		.				.

# PROGRAM AT A GLANCE

Symposium Name	ROOM	MON AM	MON PM	POSTER	TUE AM	TUE PM	POSTER	WED AM	WED PM	THU AM	THU PM	ON DEMAND
Hume-Rothery Symposium on Connecting Macroscopic Materials Properties to Their Underlying Electronic Structure: The Role of Theory, Computation, and Experiment	255A	•	•		•	•						•
ICME Case Studies: Successes and Challenges for Generation, Distribution, and Use of Public/Pre-Existing Materials Datasets	254A	•	•									•
Materials Design and Processing Optimization for Advanced Manufacturing: from Fundamentals to Application	253B	•	•		•	•	•	•	•	•		•
Metal-Matrix Composites: Advances in Processing, Characterization, Performance and Analysis	256B	•	•		•	•		•				•
Microstructural Templates Consisting of Isostructural Ordered Precipitate / Disordered Matrix Combinations: Microstructural Evolution and Properties	254A				•	•			•			•
Recent Investigations and Developments of Titanium-containing High Entropy Alloys	251C							•				•
<b>Corrosion</b>												
Environmental Degradation of Additively Manufactured Alloys	201C	•	•		•							•
Environmental Degradation of Multiple Principal Component Materials	201C			•				•	•	•		•
Environmentally Assisted Cracking: Theory and Practice	201D	•	•	•	•	•		•	•	•		•
<b>Special Topics</b>												
2022 Technical Division Student Poster Contest	Exhibit Hall C			•								
Acta Materialia Symposium	Ballroom E					•						•
Diversity in the Minerals, Metals, and Materials Professions 4 (DMMM4)	Marriott Grand Ballroom F							•	•	•	•	•
Diversity in the Minerals, Metals, and Materials Professions 4 (DMMM4)	Marriott Grand Ballroom H, J, K								•	•		
Frontiers of Materials Award Symposium Session: Data-Driven, Machine-learning Augmented Design and Novel Characterization for Nano-architected Materials	260C								•			•
Frontiers of Materials Award Symposium: Microbiologically Influenced Corrosion - How Organisms Accelerate Materials Degradation	On-Demand Only											•
Frontiers of Materials Award Symposium: Nanocarbon-based Flexible Devices: Emerging Materials and Processes	260A	•	•		•							
Late News Poster Session	Exhibit Hall C			•			•					
Moving Forward from a Pandemic: How the Field of Materials Science Has Adapted (2022 Student-led Symposium)	202A	•	•									•
Nix Award and Lecture Symposium: Nanomechanics and Mechanomaterials	259A								•			
Nix Award and Lecture Symposium: Recent Advances in Nanoindentation and Small-Scale Mechanical Testing	259A							•				



## TMS2022 All-Conference Plenary

Ballroom ABCD - 3rd Floor • Tuesday • 12:00 p.m. to 1:00 p.m.



# TMS-AIME AWARDS CEREMONY

Wednesday, March 2 • 6:00 p.m. to 7:30 p.m.  
Marriott Platinum Ballroom 6

*Open to All TMS2022 Attendees*



## CEREMONY HOSTS:

**Ellen Cerreta**  
Los Alamos National Laboratory  
2021 TMS President

**W. Jud Ready**  
Georgia Institute of Technology  
2022 TMS President

**Elizabeth Holm**  
Carnegie Mellon University  
AIME President-Elect Designate

**Michele Lawrie-Munro**  
AIME Executive Director

**Carolyn Hansson**  
University of Waterloo  
Acta Materialia Executive Secretary

**George T. "Rusty" Gray, III**  
Los Alamos National Laboratory  
Acta Materialia Chair and Treasurer

**Suveen Mathaudhu**  
Colorado School of Mines  
2021 Brimacombe Medalist

**Anthony Rollett**  
Carnegie Mellon University  
2014 Cyril Stanley Smith Award and 2011  
TMS Fellow

**Carol Handwerker**  
Purdue University  
2018 TMS Fellow and 2010 Research to  
Industrial Practice Award

# TMS-AIME AWARDS CEREMONY PROGRAM

## AIME HENRY DEWITT SMITH SCHOLARSHIP

Funded by AIME (American Institute of Mining, Metallurgical, and Petroleum Engineers), two \$2,000 scholarships are available to graduate students majoring in the field of minerals, metals, and/or materials engineering. Issued under the TMS Foundation.



**Jennifer Bustillos**  
Cornell University



**Ho Lun Chan**  
University of Virginia

## AIME ROBERT LANSING HARDY AWARD

This award recognizes a young person in the broad fields of metallurgy and materials science for exceptional promise of a successful career. Issued under the TMS Foundation.



**Ankit Srivastava**  
Texas A&M University

## AIME CHAMPION H. MATHEWSON AWARD

This award began in 1934 and recognizes a paper, or series of closely related papers with at least one common author, which represents the most notable contribution to metallurgical science in the award period.

"Anisotropy of Mass Transfer During Sintering of Powder Materials with Pore-Particle Structure Orientation," *Metallurgical and Materials Transactions A*, February 2019



**Rajendra Bordia**  
Clemson University



**Diletta Giuntini**  
Hamburg University of Technology



**Tyler Harrington**  
University of California, San Diego



**Alberto Molinari**  
University of Trento



**Eugene Olevsky**  
San Diego State University



**Elsa Torresani**  
San Diego State University



**Kenneth Vecchio**  
University of California, San Diego



**Chaoyi Zhu**  
University of California, Berkeley

## TMS/SME/AIME JAMES DOUGLAS GOLD MEDAL

Established in 1922, this award recognizes distinguished achievement in nonferrous metallurgy, including both the beneficiation of ores and the alloying and utilization of nonferrous metals. James Douglas, founder of Phelps Dodge Corporation and twice President of AIME, was an industrialist, a mining engineer, a metallurgical engineer, and a noted inventor of metallurgical equipment.



**Deepak Malhotra**  
Magellan Gold Corporation

## AIME HONORARY MEMBERSHIP AWARD

AIME Honorary Membership is one of the highest honors that the Institute can bestow on an individual. This award, established in 1872, recognizes outstanding service or distinguished scientific or engineering achievement in the fields embracing the activities of AIME and its Member Societies.



**Elizabeth Holm**  
Carnegie Mellon University

# TMS-AIME AWARDS CEREMONY PROGRAM

## ACTA MATERIALIA UNDERGRADUATE SCHOLARSHIP

Two \$5,000 scholarships are available to undergraduate students majoring in metallurgical engineering, materials science and engineering, or to undergraduate students with a significant interest in the materials area. This scholarship is supported by the generosity of Acta Materialia, Inc. and issued under the TMS Foundation.



**Andrew Ruba**  
Iowa State University



**Gladys Duran-Duran**  
Instituto Tecnológico de Morelia

## ACTA MATERIALIA MARY FORTUNE GLOBAL DIVERSITY AWARD

The award recognizes one or more of the following in the field of Materials Science and Engineering.

- Promotion of, or representation of, women and other under-represented groups in the materials science and engineering field;
- Contributions to the field of materials science and engineering, including teaching, professional service or research;
- Demonstrated commitment to mentoring students and young professionals;
- Promotion of materials science and related professional activities in the broader community.



**Amber Genau**  
University of Alabama at Birmingham

## ACTA MATERIALIA HOLLOMON AWARD FOR MATERIALS & SOCIETY

This is an international award presented by Acta Materialia, Inc. in memory of J. Herbert Hollomon, principal instigator of the journal *Acta Metallurgica*. This award recognizes an outstanding contributor to the interactions between materials technology and societal concerns.



**Alexander Michaelis**  
Fraunhofer Institute for Ceramic Technologies & Systems

## ACTA MATERIALIA SILVER MEDAL AWARD

This award honors and recognizes scientific contributions and leadership from academic, industry, and public sector leaders in the midst of their careers. The Silver Medal is established to recognize significant research contributions that are recent and timely.



**David Dye**  
Imperial College

## ACTA MATERIALIA GOLD MEDAL AWARD

This award was established by Acta Materialia, Inc. in 1973 as an international award to recognize leadership in materials research.



**Dierk Raabe**  
Max-Planck Institute

## TMS BEST STUDENT PAPER

Student members of Material Advantage are encouraged to submit essays on global or national issues, as well as technical research papers, relating to any field of metallurgy or materials science. This award is funded through the TMS Foundation.

*Graduate First Place - "Plastic Anisotropy and Twin Distributions near the Fatigue Crack Tip of Textured Mg Alloys from In-situ Synchrotron X-ray Diffraction Measurements and Multiscale Mechanics Modeling"*



**Di Xie**  
The University of Tennessee, Knoxville

*Graduate Second Place - "In-situ, Dynamic Synchrotron X-ray Radiography Studies on Melt Pool Evolution and Solidification Kinetics during Laser Fusion Processing of Ti-6Al-4V"*



**Rakesh Kamath**  
The University of Tennessee, Knoxville

# TMS-AIME AWARDS CEREMONY PROGRAM

## KAUFMAN CALPHAD SCHOLARSHIP

Supported by CALPHAD Inc. and the TMS Foundation, one \$1,000 scholarship is made to an undergraduate student majoring in metallurgical engineering, materials science and engineering, or minerals processing/extraction programs. The scholarship was established to recognize the memory of Larry Kaufman for his contributions to computational thermodynamics and its applications. This award is funded through the TMS Foundation.



**Michael Bohnet**  
Louisiana State University

## YOUNG LEADERS INTERNATIONAL SCHOLAR AWARD

The Japan Institute of Metals and Materials (JIM) established a joint Young Leaders International Scholar Program with TMS to promote young member activities and strengthen the collaborations between the two international societies. These collaborations have resulted in an exchange program, which offers select young members the opportunity to present papers at international sessions. This award is funded through the TMS Foundation.

*TMS/JIM Young Leaders International Scholar*



**Victoria Miller**  
University of Florida

## FRONTIERS OF MATERIALS AWARD

This award is given competitively to a top-performing early career professional capable of organizing a Frontiers of Materials Event comprising a hot or emergent technical topic. The recipient will organize an event in the form of a full symposium or single-session symposium.



**Andrea Koerdt**  
Federal Institute for Materials Research and Testing



**Yu-chen Karen Chen-Wiegart**  
Stony Brook University/Brookhaven National Laboratory



**Mostafa Bedewy**  
University of Pittsburgh

## EARLY CAREER FACULTY FELLOW AWARD

This award recognizes an assistant professor for his or her accomplishments that have advanced the academic institution where employed, and for abilities to broaden the technological profile of TMS. This award is funded through the TMS Foundation.



**Fadi Abdeljawad**  
Clemson University



**Yu Zou**  
University of Toronto

## ELLEN SWALLOW RICHARD DIVERSITY AWARD

This award recognizes an individual, who in the remarkable pioneering spirit of Ellen Swallow Richards, has helped or inspired others to overcome personal, professional, educational, cultural, or institutional adversity to pursue a career in minerals, metals, and/or materials. Recipients are awarded through the TMS Foundation.



**Cammy Abernathy**  
University of Florida

# TMS-AIME AWARDS CEREMONY PROGRAM

## BRIMACOMBE MEDALIST – CLASS OF 2022

This mid-career award recognizes members with sustained excellence and achievement in business, technology, education, public policy, or science related to materials science and engineering, and a record of continuing service to the profession. The intent is to recognize professionals in the middle portion of their career.



**Megan Cordill**  
Erich Schmid Institute of Materials Science



**Michael Demkowicz**  
Texas A&M University



**Khalid Hattar**  
Sandia National Laboratories



**Edward Herderick**  
The Ohio State University



**Peter Hosemann**  
University of California, Berkeley



**Jun Lou**  
Rice University



**Akane Suzuki**  
GE Research



**Michael Tonks**  
University of Florida

## WILLIAM HUME-ROTHERY AWARD

This award recognizes a scientific leader for exceptional scholarly contributions to the science of alloys by inviting him/her to be an honored presenter at the William Hume-Rothery Memorial Symposium. The awardee participates with the Alloy Phase Committee in organizing this symposium held in conjunction with the TMS Annual Meeting.



**Anton Van der Ven**  
University of California, Santa Barbara

## INSTITUTE OF METALS/ROBERT FRANKLIN MEHL AWARD

This award recognizes an outstanding scientific leader by inviting him/her to present a lecture at the society's annual meeting on a technical subject of particular interest to members in the materials science and application of metals program areas.



**Ke Lu**  
Institute of Metal Research

## BRUCE CHALMERS AWARD

This award recognizes an individual who has made outstanding contributions to the science and/or technology of materials processing.



**Carl Thompson**  
Massachusetts Institute of Technology

## MORRIS COHEN AWARD

This award recognizes an individual who has made outstanding contributions to the science and/or technology of materials properties.



**Huseyin Sehitoglu**  
University of Illinois

## CYRIL STANLEY SMITH AWARD

This award recognizes an individual who has made outstanding contributions to the science and/or technology of materials structure.



**Gregory Olson**  
Massachusetts Institute of Technology

## ALEXANDER SCOTT DISTINGUISHED SERVICE AWARD

This award recognizes a member's outstanding contributions to TMS. This award is typically presented for 10 or more years of TMS service in one or more of the following areas: membership development, student chapters, education and professional affairs, or other society-level activities.



**Carl Cady**  
Los Alamos National Laboratory

## RESEARCH TO INDUSTRIAL PRACTICE AWARD

This award recognizes an individual who has demonstrated outstanding achievement in transferring research results or findings in some aspect of the fields of metallurgy and materials into commercial production and practical use as a representative of an industrial, academic, governmental, or technical organization.



**Oden Warren**  
Bruker Nano Surfaces Division

## LEADERSHIP AWARD

This award recognizes exceptional leadership in the fields of metallurgy and materials as a representative of an industrial, academic, governmental, or technical organization.



**Steven Zinkle**  
University of Tennessee

## JULIA & JOHANNES WEERTMAN EDUCATOR AWARD

This award recognizes an individual who has made outstanding contributions to education in metallurgical engineering and/or materials science and engineering. The Weertmans rose to prominence in materials science and engineering through their pioneering research accomplishments which have profound effects on technology. This award is funded through the TMS Foundation.



**Gregory Olson**  
Massachusetts Institute of Technology

## SADOWAY MATERIALS INNOVATION AND ADVOCACY AWARD

This award recognizes a mid-career individual with impactful and broad materials science and engineering achievements and a unique ability at championing of their work and the materials science and engineering field through education, public advocacy, or entrepreneurship, particularly in areas related to sustainability. This award is funded through the TMS Foundation.



**Elsa Olivetti**  
Massachusetts Institute of Technology

## OLEG D. SHERBY AWARD

This award recognizes an individual, or small group of collaborators, who has made significant contributions to the understanding of the behavior of materials at high temperatures. This award is funded through the TMS Foundation.



**Michael Kassner**  
University of Southern California

# TMS-AIME AWARDS CEREMONY PROGRAM

## WILLIAM D. NIX AWARD

This award is established to honor William D. Nix and the tremendous legacy that he has developed and shared with the minerals, metals, and materials community, and to highlight and promote continued progress and innovation relevant to research into the underlying mechanisms and mechanical behavior of macro-, micro-, and nanoscale materials. The award is funded through the TMS Foundation.



**Huajian Gao**  
Nanyang Technological University



**Jan Miller**  
University of Utah



**Amit Misra**  
University of Michigan



**Anil Sachdev**  
General Motors Global Research and Development



**Patrice Turchi**  
Lawrence Livermore National Laboratory

## TMS FELLOW – CLASS OF 2022

This award recognizes members of TMS who are qualified for elevation to the Class of Fellow by reason of outstanding contributions to the practice of metallurgy, materials science, and technology. To be inducted, the TMS member must have a good personal reputation and distinction as an eminent authority in some aspect of the practice of metallurgy, materials science, and technology.



**Eduard Arzt**  
Leibniz Institute for New Materials



**Jiann Yang Hwang**  
Michigan Technological University



**John Lewandowski**  
Case Western Reserve University



**Ju Li**  
Massachusetts Institute of Technology



**ZiKui Liu**  
Pennsylvania State University



**Kathy Lu**  
Virginia Polytechnic Institute and State University

## ADDITIONAL 2022 AWARD RECIPIENTS

### EXTRACTION & PROCESSING DIVISION (EPD)

#### EPD DISTINGUISHED LECTURER AWARD

**David Dreisinger**  
University of British Columbia

#### EPD DISTINGUISHED SERVICE AWARD

**Corby Anderson**  
Colorado School of Mines

#### EPD SCIENCE AWARD

"X-ray Radioscopic Visualization of Bubbly Flows Injected Through a Top Submerged Lance into a Liquid Metal," *Metallurgical and Materials Transactions B*, February 2020

**Megumi Akashi, Olga Keplinger, Natalia Shevchenko, Sten Anders, and Sven Eckert**  
Helmholtz Zentrum Dresden-Rossendorf

**Markus Reuter**  
SMS Group GmbH

#### EPD PYROMETALLURGY BEST PAPER AWARD

"Processing of Complex Materials in the Copper Industry: Challenges and Opportunities Ahead," *JOM*, July 2020

**Gerardo Alvear-Flores**  
Rio Tinto

**Carlos Risopatron**  
International Copper Study Group

**Joe Pease**  
Mineralis Consultants

# TMS-AIME AWARDS CEREMONY PROGRAM

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

"Simulation-Based Exergy and LCA Analysis of Aluminum Recycling: Linking Predictive Physical Separation and Re-melting Process Models with Specific Alloy Production," *Journal of Sustainable Metallurgy*, March 2020

**Juho Hannula**  
AFRY

**Jose Ricardo da Assuncao Godinho and Alejandro Abadias Llamas**  
Helmholtz-Zentrum Dresden-Rossendorf

**Saija Luukkanen**  
University of Oulu

**Markus Reuter**  
SMS Group GmbH

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

"Simulation of Shrinkage Porosity Formation During Alloy Solidification," *Metallurgical and Materials Transactions B*, May 2020

**Vahid Khalajzadeh**  
MEMC

**Christoph Beckermann**  
University of Iowa

## EPD MATERIALS CHARACTERIZATION BEST POSTER AWARD - FIRST PLACE

"S/TEM Characterization of Interdendritic Phases in Ni-30Cr Weld Metal 52XL"

**Cheng-Han Li, Carolin Fink, and John Lippold**  
The Ohio State University

**Joerg Jinschek**  
Technical University of Denmark

## EPD MATERIALS CHARACTERIZATION BEST POSTER AWARD - SECOND PLACE

"Thermal Stability of Plain Arapaima Scales and Scales-reinforced Epoxy Matrix Composites"

**Wendell Bruno Almeida Bezerra, Ulisses Oliveira Costa, Michelle Souza Oliveira, Fernanda Santos da Luz, Luana Crystine da Cruz Demosthenes, and Sergio Neves Monteiro**  
Military Institute of Engineering

## EPD MATERIALS CHARACTERIZATION BEST POSTER AWARD - THIRD PLACE

"Effect of the Incorporation of Bauxite and Iron Ore Tailings on the Properties of Clay Bricks"

**Gustavo Lima, Beatryz Mendes, Leonardo Pedroti, Bianca Bonomo, Anna Carolina Lucas, Livia Silva, and Marcia Lopez**  
Universidade Federale de Vicosa

## FUNCTIONAL MATERIALS DIVISION (FMD)

### FMD DISTINGUISHED SCIENTIST/ENGINEER AWARD

**Roger Narayan**  
University of North Carolina

### FMD JOHN BARDEEN AWARD

**Long-Qing Chen**  
Pennsylvania State University

### FMD JEM BEST PAPER AWARD

"Porous Fe@Fe<sub>3</sub>O<sub>4</sub>-C Nanocomposite Using Polyvinyl Alcohol Sponge as Template for Microwave Absorption," *Journal of Electronic Materials*, November 2020

**Wenjin Zhang, Zidong Zhang, Yuliang Jiang, Xueyan Fu, Hongyan Du, Rui Tian, Guojing Zhao, Shengmei Wei, and Runhua Fan**  
Shandong University

**Chuanxin Hou**  
Yantai University

## LIGHT METALS DIVISION (LMD)

### LMD DISTINGUISHED SERVICE AWARD

**Alan Tomsett**  
Rio Tinto Pacific Operations

### LMD TECHNOLOGY AWARD

**Dag Mortensen**  
Institute for Energy Technology

### LMD JOM BEST PAPER AWARD

"Refining of Secondary Aluminum: Important Chemical Factors," *JOM*, September 2021

**Geoffrey Sigworth**  
GKS Engineering Services

## TMS-AIME AWARDS CEREMONY PROGRAM

### LMD MAGNESIUM TECHNOLOGY BEST PAPER AWARD - APPLICATION

"Toward Development of Strong and Formable Magnesium Alloy Sheets with Bake-Hardenability," *JOM*, May 2021

**Taisuke Sasaki, Zehao Li, and Kazuhiro Hono**  
National Institute for Materials Science

**MingZhe Bian**  
National Institute of Advanced Industrial Science and Technology

### LMD MAGNESIUM TECHNOLOGY BEST PAPER AWARD - FUNDAMENTAL RESEARCH

"Mechanisms and Machine Learning for Magnesium Alloys Design," *Magnesium Technology 2021*

**Zongrui Pei**  
National Energy Technology Laboratory

### LMD MAGNESIUM TECHNOLOGY AWARD - STUDENT PAPER

"Thermally Activated Nature of Basal and Prismatic Slip in Mg and Its Alloys," *Magnesium Technology 2021*

**Mohammed Shabana, Jishnu Bhattacharyya, and Sean Agnew**  
University of Virginia

**Marek Niewczas**  
McMaster University

### LMD MAGNESIUM TECHNOLOGY AWARD - BEST POSTER

"Eutectic Modification of Mg<sub>2</sub>Si in Mg-Si Alloys for Faster Hydrogen Absorption Kinetics"

**Manjin Kim, Julio Piraquive, Yahia Ali, Stuart McDonald, and Kazuhiro Nogita**  
University of Queensland

**Trevor Abbott**  
RMIT University

### LIGHT METALS AWARD

"Contactless Ultrasonic Treatment in Direct Chill Casting," *JOM*, January 2020

**Catherine E.H. Tonry, Valdis Bojarevics, Georgi Djambazov, and Koulis Pericleous**  
University of Greenwich

### LIGHT METALS SUBJECT AWARD - ALUMINUM REDUCTION TECHNOLOGY

"Experience with Lengthy Pot Hibernation at Alcoa Baie-Comeau," *Light Metals 2021*

**Patricia Gagnon and Marie-Eve Laframboise**  
Alcoa Baie-Comeau Smelter

**Xiangwen Wang**  
Alcoa Aluminum Center of Excellence

### LIGHT METALS SUBJECT AWARD - ELECTRODE TECHNOLOGY FOR ALUMINUM PRODUCTION

"Development and Applications of the Four Points Probe (4PP) Electrical Resistivity Measurements for Anode Process Optimization," *Light Metals 2021*

**Julien Lauzon-Gauthier and John Secasan**  
Alcoa Continuous Improvement Smelting Technology

### LIGHT METALS SUBJECT AWARD - WARREN PETERSON CAST SHOP FOR ALUMINUM PRODUCTION

"Contactless Ultrasonic Treatment in Direct Chill Casting," *JOM*, January 2020

**Valdis Bojarevics, Georgi Djambazov, Koulis Pericleous, and Catherine E.H. Tonry**  
University of Greenwich

### LIGHT METALS SUBJECT AWARD - ALUMINUM ALLOYS

"Review of Retrogression Forming and Reaging for AA7075-T6 Sheet," *Light Metals 2021*

**Jon T. Carter and Louis G. Hector**  
General Motors Warren Tech Center

**Katherine E. Rader and Eric M. Taleff**  
University of Texas at Austin

"Simulations of Wear-Induced Microstructural Evolution in Nanocrystalline Aluminum," *Light Metals 2021*

**Yeqi Shi and Izabela Szlufarska**  
University of Wisconsin-Madison

# TMS-AIME AWARDS CEREMONY PROGRAM

## LIGHT METALS SUBJECT AWARD - ALUMINA/BAUXITE

"Revisiting Alternative Smelter Grade Alumina Production Processes"

**Andrey Panov, Alexander Senyuta, and Andrey Smirnov**

RUSAL Engineering and Technological Center

## LMD/EPD ENERGY BEST PAPER AWARD - PROFESSIONAL

"Fabrication of a Novel Highly Thermal Conductive Shape-Stabilized Phase-Change Material Using Cheap and Easily Available Cabbage Mustard Biochar," *JOM*, August 2021

**Yan Chen, Junkai Gao, Qian Shi, Shibin Wu, Qinyao Xu, and Junwei Zhang**

Zhejiang Ocean University

## LMD/EPD ENERGY BEST PAPER AWARD- STUDENT

"Hydrodynamics of Gas-Liquid Two-phase Flow in Reverse Spray Washing Process," *Energy Technology 2021*

**Fang Dong, Xiao-long Li, Gui-li Liu, Yan Liu, and Ting-an Zhang**

Northeastern University

## MATERIALS PROCESSING & MANUFACTURING DIVISION (MPMD)

### MPMD DISTINGUISHED SERVICE AWARD

**Corbett Battaile**

Sandia National Laboratories

### MPMD DISTINGUISHED SCIENTIST/ENGINEER AWARD

**Jian Wang**

University of Nebraska-Lincoln

## STRUCTURAL MATERIALS DIVISION (SMD)

### SMD DISTINGUISHED SCIENTIST/ENGINEER AWARD

**Elizabeth Holm**

Carnegie Mellon University

### SMD DISTINGUISHED SERVICE AWARD

**Carl Cady**

Los Alamos National Laboratory

## SMD JOM BEST PAPER AWARD

"Microscale Observation via High-Speed X-ray Diffraction of Alloy 718 During In Situ Laser Melting," *JOM*, January 2021

**Andrew Chuang, Benjamin Gould, and Niranjana Parab**  
Argonne National Laboratory

**Joseph Aroh, Rachel Lim, Seunghee Oh, Anthony Rollett, and Robert Suter**

Carnegie Mellon University

**Joel Bernier**

Lawrence Livermore National Laboratory

**Tao Sun**

University of Virginia

## YOUNG LEADERS AWARDS

### EPD YOUNG LEADERS PROFESSIONAL DEVELOPMENT

**Mohamed Elzohiery**

Kenecott Utah Copper

**Stuart Nicol**

Glencore Technology

### FMD YOUNG LEADERS PROFESSIONAL DEVELOPMENT

**Huanyu (Larry) Cheng**

Pennsylvania State University

**Wenzhuo Wu**

Purdue University

### LMD YOUNG LEADERS PROFESSIONAL DEVELOPMENT

**Matt Pharr**

Texas A&M University

**Derek Santangelo**

Hatch

### MPMD YOUNG LEADERS PROFESSIONAL DEVELOPMENT

**Yue Fan**

University of Michigan

**Arun Devaraj**

Pacific Northwest National Laboratory

# TMS-AIME AWARDS CEREMONY PROGRAM

## SMD YOUNG LEADERS PROFESSIONAL DEVELOPMENT

**Assel Aitkaliyeva**  
University of Florida

**Clinique Brundidge**  
Lead Materials Scientist & Engineer

## YOUNG INNOVATOR IN THE MATERIALS SCIENCE OF ADDITIVE MANUFACTURING AWARD

**Tao Sun**  
University of Virginia

## STUDENT SCHOLARSHIP AWARDS

### FMD GILBERT CHIN SCHOLARSHIP

**Tylee Oldham**  
University of Kentucky

### EPD SCHOLARSHIP

**Madison Pixler**  
University of Notre Dame

**Madison Rutherford**  
Worcester Polytechnic Institute

**Jennifer Johnson**  
South Dakota School of Mines and Technology

### LMD SCHOLARSHIP

**Jarrett Loseke**  
Iowa State University

### MPMD SCHOLARSHIP

**Megan Burrill**  
Illinois Institute of Technology

### SMD SCHOLARSHIP

**Sheron Tavares**  
University of California San Diego

## TMS INTERNATIONAL SYMPOSIUM ON SUPERALLOYS SCHOLARSHIP

**Rafael Rodriguez De Vecchis**  
University of Pittsburgh

**Preston Nguyen**  
University of Pittsburgh

## ACTA MATERIALIA INC. POSTER AWARDS

"Thermal localization improves the interlayer adhesion and structural integrity of 3D printed PEEK lumbar spinal cages"

**Cemile Basgu**

"Crack initiation mechanisms of Ni-based single-crystal superalloys in the very high cycle fatigue regime at high temperature"

**Alice Cervellon**

"Data-Driven Design Guidelines for Ceramic Superlattices with Enhanced Fracture Resistance"

**Nikola Koutrná**

"Metastability in High Entropy Alloys"

**Sebastian Kube**

"Engineering highly-aligned cardiac patches by electrohydrodynamically-printed microlattices"

**Mao Mao**

"A Detailed Mechanical and Microstructural Analysis of the Ovine Tricuspid Valve Leaflets"

**William Meador**

"The influence of alloying in stabilizing a faceted grain boundary structure"

**Jonathan Priedeman**

"Evaluation of Low-Stress High-Temperature Creep: The Harper-Dorn Creep"

**Shobhit Singh**

"Direct observation of the Ni stabilising effect in interfacial (Cu,Ni)<sub>6</sub>Sn<sub>5</sub> intermetallic compounds"

**Flora Somidin**

"Deformation faulting in a metastable CoCrNiW complex concentrated alloy: A case of negative intrinsic stacking fault energy?"

**Shaolou Wei**

"A comparative study on intrinsic mobility of incoherent and semicoherent interfaces during the austenite to ferrite transformation"

**Haokai Dong**

"Machine Learned Feature Identification for Predicting Phase and Young's Modulus of Low-, Medium- and High-entropy Alloys"

**Ankit Roy**



# 36th EXHIBITION

*Located in Hall C of the Anaheim Convention Center*

## EXHIBIT HOURS AND EVENTS

### MONDAY, FEBRUARY 28

Exhibit Hours: 11:00 a.m. to 7:00 p.m.

Exhibit Opening Reception and Poster Session I: 5:30 p.m. to 7:00 p.m.

### TUESDAY, MARCH 1

Exhibit Hours: 11:00 a.m. to 7:00 p.m.

Exhibit Hall Happy Hour and Poster Session II: 5:30 p.m. to 7:00 p.m.

### WEDNESDAY, MARCH 2

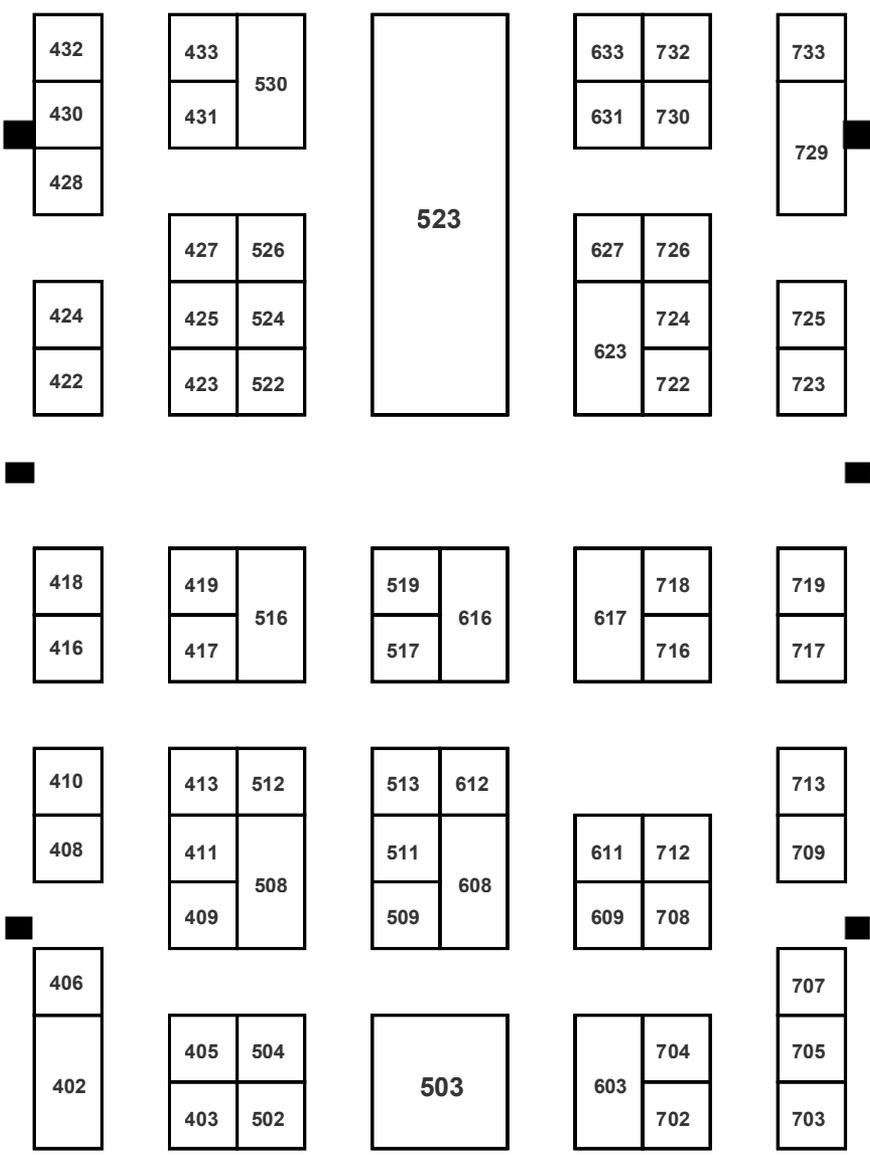
Exhibit Hours: 10:00 a.m. to 2:00 p.m.

*View the Bladesmithing Competition Display Daily in the Exhibit Hall*

View the most up-to-date list on the TMS2022 Mobile App

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**ABB, Inc.** Booth #409

ABB offers a complete range of analytical solutions to the aluminum industry: ALSCAN™ hydrogen analyzer, LiMCA inclusion analyzer, Prefil®-Footprinter melt cleanliness analyzer, PoDFA inclusion identification and quantification analysis, as well as electromagnetic stirring solutions.

**AdValue Technology, LLC** Booth #708

AdValue Technology specializes in areas of Alumina, Fused Quartz, Sapphire and Zirconia. Products vary from Crucibles, Tubes & Rods, Plates & Discs, DTA & DSC Sample Pans, Ceramic Membranes to custom components. Laser machining and metallization are available. We also sell high purity powders including Alumina Powders, Quartz Sands, TeO2 Powders, and CeO2 Polishing Powders.

**Advanced Optical Technologies** Booth #719

Advanced Optical Technologies (AOT) offers multi-dimensional material characterization for a more complete understanding of complex materials and devices and develops custom sensors for defense and commercial customers. With CrystalView CPCI, Advanced Optical Technologies (AOT) introduces a new type of microscope for non-destructive crystallographic orientation measurements.

**Alemnis AG** Booth #722

Alemnis develops and manufactures state-of-the-art instruments for in-situ and ex-situ testing of materials mechanical properties at small scales, e.g., nanoindentation, micropillar compression, cantilever bending, tensile testing, ultra high strain rate, high and low temperature, fatigue, fracture, impact, etc.

**ALMEX USA, Inc.** Booth #617

Almex USA is the leading supplier of aerospace and commercial aluminum billet and slab casting technology and equipment. The company specializes in complete turnkey "Furnace to Finish™" aluminum casthouse solutions. The well-rounded product line includes melting furnaces, degassing systems, DC casting machines, billet/slab casting systems, automation and homogenization systems.

**ASTM International** Booth #504

The ASTM International Additive Manufacturing Center of Excellence (AM CoE) is a collaborative partnership among ASTM and representatives from government, academia, and industry that conducts strategic R&D to advance AM standards, and is a leading provider of education, training, proficiency testing, certification, and advisory services globally.

**Boise State University** Booth #631

The Microscopy and Characterization Suite (MaCS) is a state-of-the-art materials characterization laboratory that provides cross-cutting capabilities that support the Center for Advanced Energy Studies' (CAES) mission in multiple initiative areas. MaCS is managed by Boise State University and is largely made possible through its partnership with the Nuclear Science User Facilities (NSUF). MaCS is specially designed to handle both radiological and non-radiological materials and provides state-of-the-art characterization facilities.

**Bruker** Booth #508

Bruker's industry-leading technologies include Micro-XRF, UMT mechanical testers, and Hysitron nanomechanical test instruments. From investigating friction and wear to nanoscale materials characterization and elemental analysis, Bruker offers advanced solutions to help you appreciate and develop innovative materials at the macro- and nano-scale.

**California Nanotechnologies** Booth #702

California Nanotechnologies offers an array of facilities including advanced consolidation techniques (Spark Plasma Sintering), cryogenic milling, and machining tools. R&D and pilot-scale production services are performed by Cal Nano for both in-house programs and customer-funded projects. Programs range from Space, Aerospace, Nuclear, and Sports & Recreation industries.

**Cameca** Booth #502

Since 1929, CAMECA has been renowned for its precision mechanics, optics, and electronic. CAMECA provides scientific instrumentation to the international research community and in-fab/near-fab metrology solutions for the semiconductor manufacturing industry. CAMECA is a business unit of AMETEK, Inc., a leading global provider of electronic instruments and electromechanical devices.

## COMPANY DESCRIPTIONS

### Carl Zeiss Microscopy, LLC

Booth #603

ZEISS microscopy is the world's only manufacturer of light, electron, ion, and X-ray microscope systems to address challenges in materials characterization and inspection. From 2D to 3D and even 4D (through time) analysis, ZEISS microscopes offer the modalities and dimensions needed to fully investigate your material microstructures.

### Claudius Peters Projects GmbH

Booth #408

Claudius Peters Projects GmbH is headquartered in Buxtehude, Hamburg with regional offices in the Americas, Europe, China and the Far East. Claudius Peters stockyards, pneumatic conveyors, silos, clinker coolers, grinding mills, and packing systems can be found in Cement, Coal, Alumina, and Gypsum plants across the globe.

### DT Equipment

Booth #616

DT Equipment's product range includes a fully automatic Element Analyzer which delivers real-time information on trace elements in liquid aluminum. With proprietary improvements over standard LIBS technology, we can deliver frequent real-time process information, rivaling laboratory accuracy, without any operator involvement – towards process automation and Industry 4.0.

### EBSA Analytical

Booth #611

EBSA Analytical provides microstructural analysis services through EBSD and EDS coupled with the SEM. The owner, Ron Witt, has been involved with EBSD since 1996, having worked for both TSL and EDAX/Ametek before founding EBSA Analytical in 2003. With over 23 years' experience, let us show you how materials characterization with EBSD can help improve your processes.

### EDAX

Booth #612

EDAX is the global leader in Energy Dispersive Spectroscopy (EDS), Electron Backscatter Diffraction (EBSD), Wavelength Dispersive Spectrometry (WDS), and X-ray Fluorescence (XRF) systems. EDAX manufactures, markets, and services high-quality products and systems for leading companies in semiconductors, metals, and geological, biological, material, and ceramics markets.

### FemtoTools AG

Booth #503

FemtoTools is a manufacturer of high-resolution nanoindenters for applications in metallurgy and thin films.

### FormAlloy

Booth #522

Headquartered in San Diego, CA, FormAlloy is an additive manufacturing technology company that is principally engaged in the design, R&D, manufacture, and integration of metal deposition systems. FormAlloy's award-winning metal AM technology provides an innovative, cost-effective solution to form, enhance, and repair 3D metal parts in a diverse set of industries.

### GLAMA

Booth #402

GLAMA, founded in 1961, is mainly building heavy-duty equipment for aluminium pot rooms, cast houses, and anode rodding shops throughout the world. Extract of our range of products: Anode Changing Vehicles; Anode Pallet Transporters; Butt Cleaning Manipulators; Furnace Charging Machines; Furnace Tending Machines; Ladle Charging Trucks; Molten Metal Carriers; Tapping Trucks.

### Haarslev Industries Press Technology GmbH + Co.Kg

Booth #406

The world leader for most efficient wear protection materials. We supply optimized wear and spare parts for Anode Paste mixers at economical prices with longer life times than any other supplier to this industry. Furthermore we provide services and process support for anode paste preparation. All of our parts for the Aluminium Industry are manufactured in Germany.

### Hycast AS

Booth #712

Hycast AS has expertise within aluminium casthouse technology and core competencies within project management, engineering and process know-how. Hycast AS has extensive experience and know-how gained from numerous projects world-wide. The main products are Billet and Slab Casting technology, Melt refining, Rod Feeders and Launderers integrated into a fully automated process.

**Keyence Corporation of America** Booth #403

KEYENCE's advanced microscope and measurement systems offer high-resolution imaging, ISO-certified roughness, and 2D/3D measurement coupled with easy-to-use interfaces for an elevated inspection experience. KEYENCE offers a full range of services: free demos and sample testing, training, after sale support, and short lead times.

**KLA Corporation** Booth #516

We provide advanced process control solutions for manufacturing wafers and reticles, integrated circuits and packaging. In close collaboration with leading customers across the globe, our expert teams of physicists, engineers, data scientists, and problem-solvers design solutions that move the world forward.

**Leica Microsystems** Booth #623

Leica Microsystems develops and manufactures microscopes and scientific instruments for the analysis of microstructures and nanostructures. Widely recognized for optical precision and innovative technology, the company is one of the market leaders in compound and stereo microscopy, digital microscopy, confocal laser scanning, and super-resolution microscopy.

**Light Metal Age** Booth #519

*Light Metal Age* magazine has a long legacy in the aluminum industry with 75 years of experience covering primary and secondary production, extrusion, and rolling. We provide vital technical, industrial, and market information to aluminum producers and processors around the world. Aluminum in automotive, aerospace, and building and construction, are also major topics.

**Materials Square, Inc.** Booth #433

Materials Square is a material simulation web platform. Through the material simulation R&D environment provided as SaaS, you can perform the whole process of simulation from material modeling to result analysis on the web without additional server construction, maintenance and software installation. Also, you get the fastest simulation data with cloud servers.

**Metglas, Inc.** Booth #419

**MTI Corporation** Booth #509

MTI Corporation has been providing a total solution for materials research labs since 1995. MTI supplies ceramic, crystal, metallic substrates from A-Z and Nano-powder. MTI also provides laboratory R&D equipment including alloy melting, casting, annealing, sectioning, polishing, mixing machines, high temperature muffle and tube furnaces, pressing machines, film coaters, high vacuum systems, high pressure furnaces, RTP furnaces, hydrogen furnaces, as well as compact XRD/XRF for Metallographic analysis and the Amorphous Metallic Material Research Equipment.

**Netzsch Instruments NA LLC** Booth #512

NETZSCH Instruments offers highly sensitive, versatile, and reliable thermal analysis instrumentation for R&D, quality control, process safety, and failure analysis. Our instruments and methods allow for material characterization and the study of properties including Cp, enthalpy, weight change, Young's modulus, conductivity, diffusivity, and evolved gas analysis.

**Psylotech Inc** Booth #718

Psylotech designs and builds precision multi-scale micromechanical testing systems for the global stage. We provide the research community with tools to help better test new materials in static and fatigue that ultimately provide backbone for modeling data that supports product development. Psylotech is based in Evanston, Illinois, USA.

**REL, Inc.** Booth #707

**Sente Software Ltd.** Booth #709

Developers of JMatPro®, a powerful simulation software package for calculating a wide range of materials properties and behavior for multi-component alloys used in industrial practice. Data exports are available to casting, forming, forging and heat treatment packages. Sente Software has a proven track record for innovation and excellence with customers worldwide.

## COMPANY DESCRIPTIONS

### Sistem Teknik Industrial Furnaces Ltd.

Booth #422

Designing and producing industrial furnaces since 1979, Sistem Teknik uses state-of-the-art technology that is fully integrated to industry 4.0 thermal processing applications. Being one of Europe's largest turn-key solution providers for heat treatment, Sistem Teknik responds to a wide range of demands related to aluminum, brass, and composite metals.

### TA Instruments

Booth #719

Visit TA Instruments for premier technology in thermal analysis and thermophysical testing. Innovative instrumentation for materials characterization of polymers, metals, ceramics, and more. Unmatched performance from our Discovery Series DSC, TGA, and SDT and industry leading instruments for Thermal Conductivity, Dilatometry, and Thermal Diffusivity by Flash up to 2800°C.

### Tekna

Booth #627

### Tenova Inc.

Booth #517

Tenova Inc., is a worldwide leader in the design and supply of loose carbonaceous material calciners based on rotary hearth technology. These furnaces are used for the processing of petroleum coke, coal, formed coke briquettes, and various other carbon-based products. We also provide aluminum processing furnaces for a variety of applications as well as technical services.

### TESCAN

Booth #526

TESCAN develops state-of-the-art SEMs, FIB-SEMs, and micro-CTs that are capable of providing valuable insights into a broad range of scientific disciplines. TESCAN systems can image with both high resolution and high contrast and are extremely versatile. From materials to geology, our instruments help unlock the secrets of "How" and "Why."

### Tethon 3D

Booth #413

Tethon 3D manufactures ceramic powders and UV curable resins for additive manufacturing and sells the Bison 1000 ceramic 3d printer, the world's only desktop DLP printer designed for ceramics and metals.

### Thermo-Calc Software Inc.

Booth #609

Leading developer of software for computational thermodynamics and diffusion controlled simulations. Thermo-Calc: thermodynamic and phase equilibria calculations for multicomponent systems. DICTRA: predicting diffusion in multicomponent alloys. TC-PRISMA: simulations of precipitation kinetics. Databases for steels, Ti, Al-, Mg-, HEAs, Ni-superalloys, and other materials.

### Thermo Fisher Scientific

Booth #431

Innovative materials hold the key to improving safety, fuel efficiency, and productivity. Thermo Fisher Scientific supplies innovative solutions for materials science research, combining SEMs, TEMs, DualBeam™ FIB-SEMs and micro CT with advanced software suites to take customers from data to understanding.

### Trefimet S.A.

Booth #530

Trefimet is a Chilean company manufacturing advanced thermal lances. Thanks to new and revolutionary designs, our thermal lances can be used on steel and smelting plants on countless operations. With improved power and accuracy, Trefimet lances will extend equipment life span, making them the right choice to perform tapping and cleaning operations.

### UES, Inc.

Booth #524

Robo-Met.3D is a fully automated serial sectioning system for three-dimensional microstructural investigations. The system enables metallographic etching and imaging of the microstructure of materials. Post-processing reassembles these 2D images, gathered over an optical scale, into 3D models.

### Wagstaff, Inc.

Booth #608

Custom Aluminum DC Casting Systems from Wagstaff. Wagstaff, Inc. is a 73-year-old industrial manufacturing and engineering company that provides customized, advanced aluminum direct-chill (DC) solidification technology to rolling ingot and extrusion billet producers worldwide. Wagstaff's headquarters are located in Spokane, Washington, USA.

View the most up-to-date list on the TMS2022 Mobile App

CONFERENCE  
LANYARDS:



REGISTRATION  
CONFIRMATION:



REFRESHMENT  
BREAK:



CONFERENCE GUIDE  
INSERT:



MONDAY  
NEWSLETTER:



TUESDAY NEWSLETTER  
& COFFEE BREAK:



# TMS UPCOMING MEETINGS

TMS offers programming that spans the technical interests of the global minerals, metals, and materials community.



First World Congress on  
**AIM**  
ARTIFICIAL INTELLIGENCE  
MATERIALS & MANUFACTURING 2022

April 3–6, 2022  
Pittsburgh, Pennsylvania, USA  
[www.tms.org/AIM2022](http://www.tms.org/AIM2022)



MANUFACTURING  
**ICME**  
DESIGN MATERIALS

April 24–28, 2022  
Incline Village, Nevada, USA  
[www.tms.org/ICME2022](http://www.tms.org/ICME2022)



The 6th International Congress on  
**3DMS**  
3D Materials Science 2022

June 26–29, 2022  
Washington, D.C., USA  
[www.tms.org/3DMS2022](http://www.tms.org/3DMS2022)



**AM** | ADDITIVE  
BENCH 2022 | MANUFACTURING  
BENCHMARKS

August 15–18, 2022  
Bethesda, Maryland, USA  
[www.tms.org/AMBench2022](http://www.tms.org/AMBench2022)



**LMPC** 2022  
Liquid Metal Processing  
& Casting Conference

September 18–21, 2022  
Philadelphia, Pennsylvania, USA  
[www.tms.org/LMPC2022](http://www.tms.org/LMPC2022)



Technical Meeting and Exhibition  
**MS&T 22**  
MATERIALS SCIENCE & TECHNOLOGY

October 9–13, 2022  
Pittsburgh, Pennsylvania  
[www.matscitech.org](http://www.matscitech.org)



**TMS 2023**  
152<sup>nd</sup> Annual Meeting & Exhibition

March 19–23, 2023  
San Diego, California  
[www.tms.org/TMS2023](http://www.tms.org/TMS2023)



**SUPERALLOY 718**  
and Derivatives

May 14–17, 2023  
Pittsburgh, Pennsylvania, USA  
[www.tms.org/Superalloy718-2023](http://www.tms.org/Superalloy718-2023)



For a complete listing of upcoming events, scan this QR code or visit [www.tms.org/UpcomingMeetings](http://www.tms.org/UpcomingMeetings)

WHERE MATERIALS PEOPLE

**MEET.**

COLLABORATE.

LEARN

DEVELOP

GROW



# THANK YOU FOR JOINING TMS

and welcome to our global community of minerals, metals, and materials scientists and engineers. Through TMS, you'll meet collaborators from around the world, learn from leaders in the field, develop your skills, and grow your career. Let our members show you how to make the most of your membership.

“ When I started my career in academia, the first professional conference I attended was the TMS Annual Meeting. There, I was able to network and make connections with colleagues from industry, academia, and national labs who were instrumental in my early career development. Those networking and professional development experiences have been the most valuable to me. ”

— *Viola Acoff, TMS Membership & Student Development Director,  
2022-2025 TMS Board of Directors*



# WHERE MATERIALS PEOPLE

# COLLABORATE.

TMS makes a global community of materials professionals accessible to you. Connect in-person at TMS events or reach out virtually to begin building or growing your network of international colleagues and experts.



**Connect** at In-Person Meetings



**Join** a Technical Committee



**Find** Colleagues and Mentors

**GET STARTED:** Make it easy for other members to learn more about you! Update your profile with division preferences and technical keywords at [members.tms.org](https://members.tms.org).

# WHERE MATERIALS PEOPLE

# LEARN

Consult TMS resources when you need solutions to technical problems and to make more informed decisions in your work. In addition to offering valuable guidance, our journals and publications offer excellent venues for publishing your research.



**Read and Publish in Six TMS Technical Journals**

**Access 20 Additional Materials Journals from Springer**

**Browse Members-Only Online Libraries**

**GET STARTED:** Log in to [www.tms.org/Journals](http://www.tms.org/Journals) to begin reading.

WHERE MATERIALS PEOPLE

# DEVELOP

As a TMS member, you can build your profile in the community, help others build theirs, and access new career opportunities.

**Apply** for TMS Awards or Nominate a Colleague

**Explore** the TMS Career Center

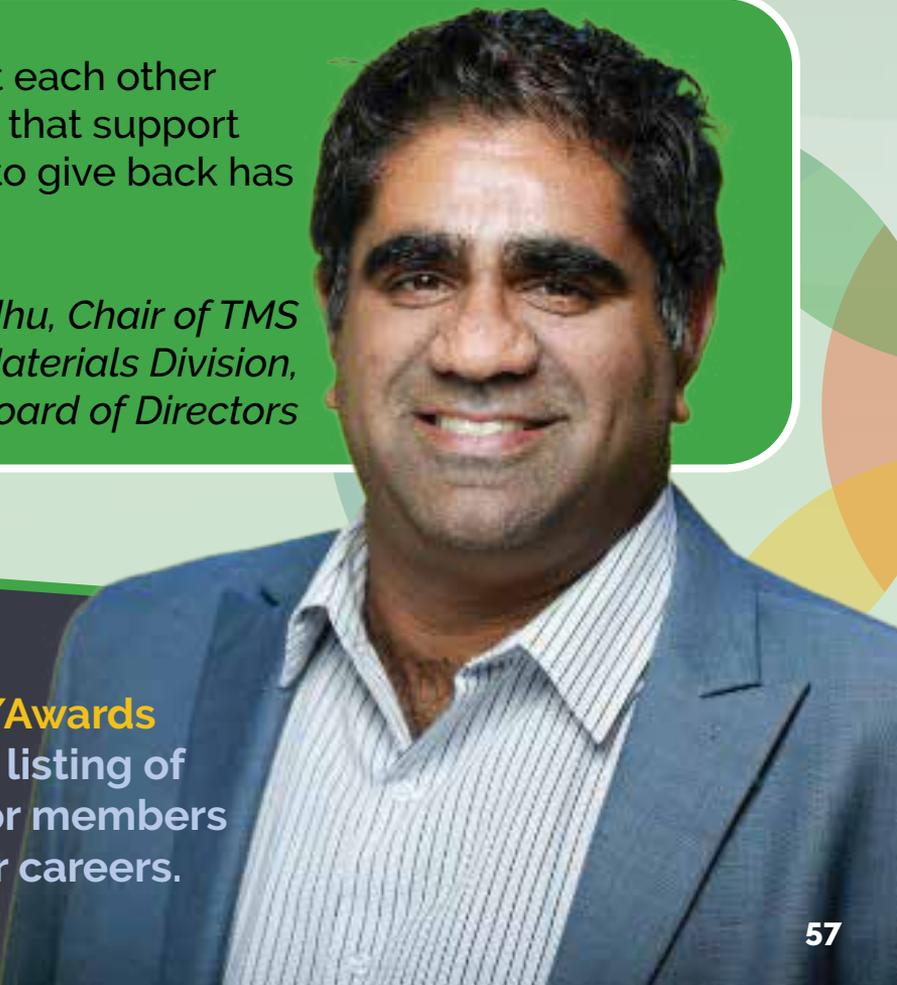
**Apply** for Young Professional Programs

“ Our members care about each other at every level and having that support structure and the ability to give back has kept me engaged. ”

— *Suveen Mathaudhu, Chair of TMS Structural Materials Division, 2022-2025 TMS Board of Directors*

**GET STARTED:**

Visit [www.tms.org/Awards](http://www.tms.org/Awards) to view a complete listing of available awards for members in all stages of their careers.



# WHERE MATERIALS PEOPLE

## GROW

Broaden your skillset and gain valuable professional skills through both in-person and on-line professional development courses, workshops, and webinars.

### **Participate** in Professional Development Courses

### **Access** Live and Recorded Webinars through the TMS Webinar Library



“Being a member of TMS played a major role in developing my leadership skills, growing my professional experience, and keeping me updated with the new research and developments in my field.”

— *Mohamed Elzohiery, 2022 TMS  
Extraction & Processing Division Young  
Leaders Professional Development  
Award Recipient*

# WHERE MATERIALS PEOPLE

## ADVANCE

By joining TMS, you took a first major step toward building a productive and meaningful career. Now take these next steps to increase your involvement and make the most of your membership.

**Log in to the members only website to explore your member benefits. Go to [members.tms.org](https://members.tms.org).**

**Download your membership card or the TMS member icon to proudly display your new affiliation. Go to [members.tms.org](https://members.tms.org).**

**View a complete listing of TMS technical committees and join the one that best matches your interests. Go to [www.tms.org/Committees](https://www.tms.org/Committees).**



**GET STARTED: Visit [www.tms.org/PD](https://www.tms.org/PD) to learn about current professional development offerings.**

## CONTACT US



If you have any questions or need assistance with your membership, please contact our Member Services Team.

**E-MAIL:** [members@tms.org](mailto:members@tms.org)



**PHONE:** 1-724-776-9000 (U.S. and Canada only)  
or 1-724-776-9000 (all other countries)  
Press '1' to speak with customer service.



### Member Services Team

Top to Bottom: Donna Edenhart, Courtney Hammer, Diana Grady



**TMS** ( MEMBERSHIP

THE WORLD COMES HERE

# TMS 2023

152<sup>nd</sup> Annual Meeting & Exhibition

## SAVE THE DATE

MARCH 19–23, 2023  
SAN DIEGO, CALIFORNIA, USA  
#TMSANNUALMEETING

NEXT YEAR, TMS RETURNS TO ONE OF ITS MOST POPULAR MEETING DESTINATIONS:  
SAN DIEGO, CALIFORNIA!

### A FAVORITE MEETING LOCATION

- San Diego traditionally hosts some of our best-attended meetings, including our record-breaking TMS2020 with more than **4,600 attendees**.
- San Diego is a **convenient travel spot for international attendees**, with direct flights arriving from Canada, Mexico, Europe, and Asia.
- In 2023, we will return to the San Diego Convention Center but use a new headquarters hotel, so prepare to join us at the **Hilton San Diego Bayfront** for TMS2023!



### MARK YOUR CALENDAR WITH THESE KEY DATES:

**May 2022:** Call for Abstracts Opens

**October 2022:** Registration Opens

**March 19–23, 2023:** Conference Dates



The New Headquarters Hotel:  
**HILTON SAN DIEGO BAYFRONT**



STAY UPDATED AT:  
[www.tms.org/TMS2023](http://www.tms.org/TMS2023)

Images may not represent current TMS Meetings health and safety measures, such as masks and social distancing.

# QUICK REFERENCE GUIDE FOR TMS2022

## STAY INFORMED

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Last-minute schedule changes in speakers' travel plans are to be expected this year. Use these tools to stay up to date on the latest conference plans.

### Download the App

We *strongly encourage* all attendees to download the **TMS2022 Mobile App** for access to current program plans. A support desk is available on the second floor of the Anaheim Convention Center to assist you.

### View Meeting Highlights

Visit [www.tms.org/TMS2022](http://www.tms.org/TMS2022) to download a PDF of the technical program and view details on keynote sessions, networking events, and more.

### Read TMS2022 News

Check your e-mail or the App each morning for the *TMS2022 News* newsletter, which will provide daily news and announcements.

### Access WiFi

Free WiFi is available at the Anaheim Convention Center. Connect to the **Anaheim Free WiFi** network. No password is needed.

## NEW FOR 2022

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### Welcome Back Reception

Introduce yourself to fellow conference attendees and network with individuals from your technical division at the **Welcome Back Reception**, Sunday evening, from 7:00 p.m. to 8:00 p.m. on the third floor of the Anaheim Convention Center.

### Welcome Breakfast

Start off the first day of programming at a breakfast with colleagues on **Monday morning**. Breakfast will be from 7:00 a.m. to 8:30 a.m. in Hall C of the Anaheim Convention Center.

## USE YOUR CONFERENCE GUIDE

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### Find Your Way

Turn to **page 5** for maps of the Anaheim Convention Center, the Anaheim Marriott, and surrounding areas.

### Meet Award Recipients

View the honorees who will be recognized at the TMS-AIME Awards Ceremony beginning on **page 34**.

### Preview the Exhibit

Learn about exhibiting companies with the TMS2022 Exhibit Directory, starting on **page 45**.

### View Member Guide

New to TMS? View the membership guide starting on **page 53** to start exploring your benefits.