

THE WORLD COMES HERE.

# TMS 2023

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

MARCH 19–23, 2023

SAN DIEGO CONVENTION CENTER & HILTON SAN DIEGO BAYFRONT  
SAN DIEGO, CALIFORNIA, USA



## CONFERENCE GUIDE

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

### FIND MORE MEETING DETAILS:

Download the TMS2023 App for the most up-to-date schedule.



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CONFERENCE GUIDE  
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 <p><b>Acta Materialia</b></p> <p>IMPACT FACTOR* 9.209 CITE SCORE** 14.2</p>	 <p><b>Acta BioMaterialia</b></p> <p>IMPACT FACTOR* 10.633 CITE SCORE** 15.6</p>	 <p><b>Scripta Materialia</b></p> <p>IMPACT FACTOR* 6.302 CITE SCORE** 10.1</p>	 <p><b>Materialia</b></p> <p>CITE SCORE** 4.7</p>	 <p><b>materials letters</b></p> <p>IMPACT FACTOR* 3.574 CITE SCORE** 6.0</p>	 <p><b>MATERIALS SCIENCE &amp; ENGINEERING</b></p> <p>IMPACT FACTOR* 6.044 CITE SCORE** 9.4</p>
 <p><b>JMR&amp;T</b> JOURNAL OF MATERIALS RESEARCH AND TECHNOLOGY</p> <p>IMPACT FACTOR* 6.267 CITE SCORE** 5.9</p>	 <p><b>Results in Materials</b></p> <p>CITE SCORE** 4.6</p>	 <p><b>MATERIALS CHARACTERIZATION</b></p> <p>IMPACT FACTOR* 4.537 CITE SCORE** 6.9</p>	 <p><b>Intermetallics</b></p> <p>IMPACT FACTOR* 4.075 CITE SCORE** 6.8</p>	 <p><b>CALPHAD</b></p> <p>IMPACT FACTOR* 2.004 CITE SCORE** 3.6</p>	 <p><b>materials DESIGN</b></p> <p>IMPACT FACTOR* 9.417 CITE SCORE** 13.2</p>

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# WELCOME TO TMS2023!

## Welcome to the TMS 2023 Annual Meeting & Exhibition!

Please take advantage of all the many opportunities to connect with your colleagues on both a professional and personal level while you're here in San Diego. Here are a few tips to help:

### Start Your Week with Social Events

Please join me at the Sunday night Welcome Reception starting at 7:00 p.m. in Hall F of the San Diego Convention Center and at the Monday morning Welcome Breakfast, which will run from 7:00 a.m. to 8:30 a.m. in Hall F of the convention center. Both are excellent ways to ease into your week, catch up with old friends, meet your fellow attendees, and get acclimated to the meeting before the start of technical programming on Monday morning.

### Join a Technical Committee Meeting

Attending a technical committee meeting is the perfect way to get engaged and network with other attendees who share your technical interests. Technical committee meetings are open to all TMS members, so they will welcome your attendance and contributions. View the calendar on page 34 for a listing of technical committee meetings planned this week, or check the TMS2023 App. Just choose the committee that suits you best, go to the meeting room at the appointed time, and introduce yourself. Bring a friend too!

### Explore Beyond the Session Rooms

Technical programming is the core of the TMS Annual Meeting & Exhibition, but there is so much more to this event. Definitely make time this week to visit the exhibit hall and connect with new partners—the Exhibit Opening Reception on Monday at 5:30 p.m. and the Exhibit Hall Happy Hour on Tuesday at 5:30 p.m. are great times to do that. These two events also feature two different poster sessions, so browse the displays and start a conversation with a presenter. On Wednesday at 6:00 p.m., visit room 20A of the convention center to congratulate this year's award recipients at the TMS-AIME Awards Ceremony.

No matter how you structure your week, I encourage you to make the most of your time with us in San Diego. If you see me in the hallways, meeting rooms, or at an event—please do stop and say hi if we already know each other, or introduce yourself if we don't.

### Have a great week at TMS2023!



**W. Jud Ready**  
2022 TMS President

## GETTING AROUND

Whether this is your first, or (like me) your 31st TMS Annual Meeting, you'll need the proper tools to help you plan your week and find your way. Here are a couple keys to success:

## DOWNLOAD THE APP



The TMS2023 App is an indispensable tool for navigating the conference and viewing the most up-to-date programming information. You can use the app to build your schedule for the week, search for presentations and speakers, preview exhibitors, and more.

## STUDY THE MAPS

If you've been to any of our recent TMS Annual Meetings in San Diego, you'll notice that things have changed a bit this year. We're now headquartered in the Hilton San Diego Bayfront and using a different section of the convention center. Nobody likes feeling lost, so if you can't find your way, consult the maps starting on page 5 to get acquainted with our new locations or use the TMS2023 App.





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## CONNECT TO WI-FI AT TMS2023



### San Diego Convention Center

To access Wi-Fi in the San Diego Convention Center:



Network: **TMS2023**  
Password: **tmsam2023**

### Hilton San Diego Bayfront

To access Wi-Fi in the public areas of the Hilton San Diego Bayfront:



Network: **TMS2023**  
Password: **MMMS2023**

*Please note the letter case when typing passwords to connect to these Wi-Fi networks.*

## TIME ZONE IN SAN DIEGO

Please note that all times listed in this guide refer to **Pacific Daylight Time**.



## LUNCH OPTIONS

Food trucks and concessions will be available throughout the week for TMS2023 attendees.  
**See page 16 for details.**





# TMS2023 APP AND SCHEDULE INFORMATION

## Download the TMS2023 App

Build a personalized schedule, view the most up-to-date technical program information, and more with the TMS 2023 Annual Meeting & Exhibition App. To download, search "TMS Annual Meeting" on the App Store® or on Google Play™. You can also use a web-based version of the app by visiting [www.tms.org/TMS2023app](http://www.tms.org/TMS2023app).

## How to Log In

To use the app or web platform you will need to log in using the same email address you used when registering for TMS2023.

**The password for all users is TMS2023.**

Can't remember which email you registered with? Check the printed ticket attached to your registration badge titled "Use the TMS 2023 Annual Meeting App" for a reminder.

## Searching Within the App

Use the general search function of the app to find speakers, attendees, and sessions. Results display session-level detail. Select a session to view individual talks.

To search for specific talks, use the search option located within the agenda function. You can also use filters to narrow your results and navigate the meeting with ease.

## DOWNLOAD THE TMS2023 APP



Download on the  
**App Store**



GET IT ON  
**Google Play**



Build Your Schedule, Access the Most Updated Technical Program Information, and View Event Plans

## Download Technical Program PDF

Please note that a printed version of the TMS2023 technical program will not be available to attendees. You can, however, download a PDF of the technical program from the TMS2023 website. Both print- and mobile-friendly versions of the program in searchable PDF format are now available. For real-time programming updates, you can also view the online session sheets. These resources can be found at [www.tms.org/TMS2023/TechnicalProgram](http://www.tms.org/TMS2023/TechnicalProgram).

## DOWNLOAD THE TMS2023 TECHNICAL PROGRAM PDF



Browse or Search the Complete TMS2023 Technical Program

## Stay Updated All Week Long

Make sure you stay up-to-date on major schedule changes and key events at the TMS 2023 Annual Meeting & Exhibition by taking these simple steps:

- 1. Enable Notifications from the TMS2023 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 TMS2023 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 email daily or read the most recent issue through the app.
- 3. Connect with Other Attendees on Twitter:**  
Use #TMSAnnualMeeting to post information and updates through Twitter for other TMS2023 attendees to view.

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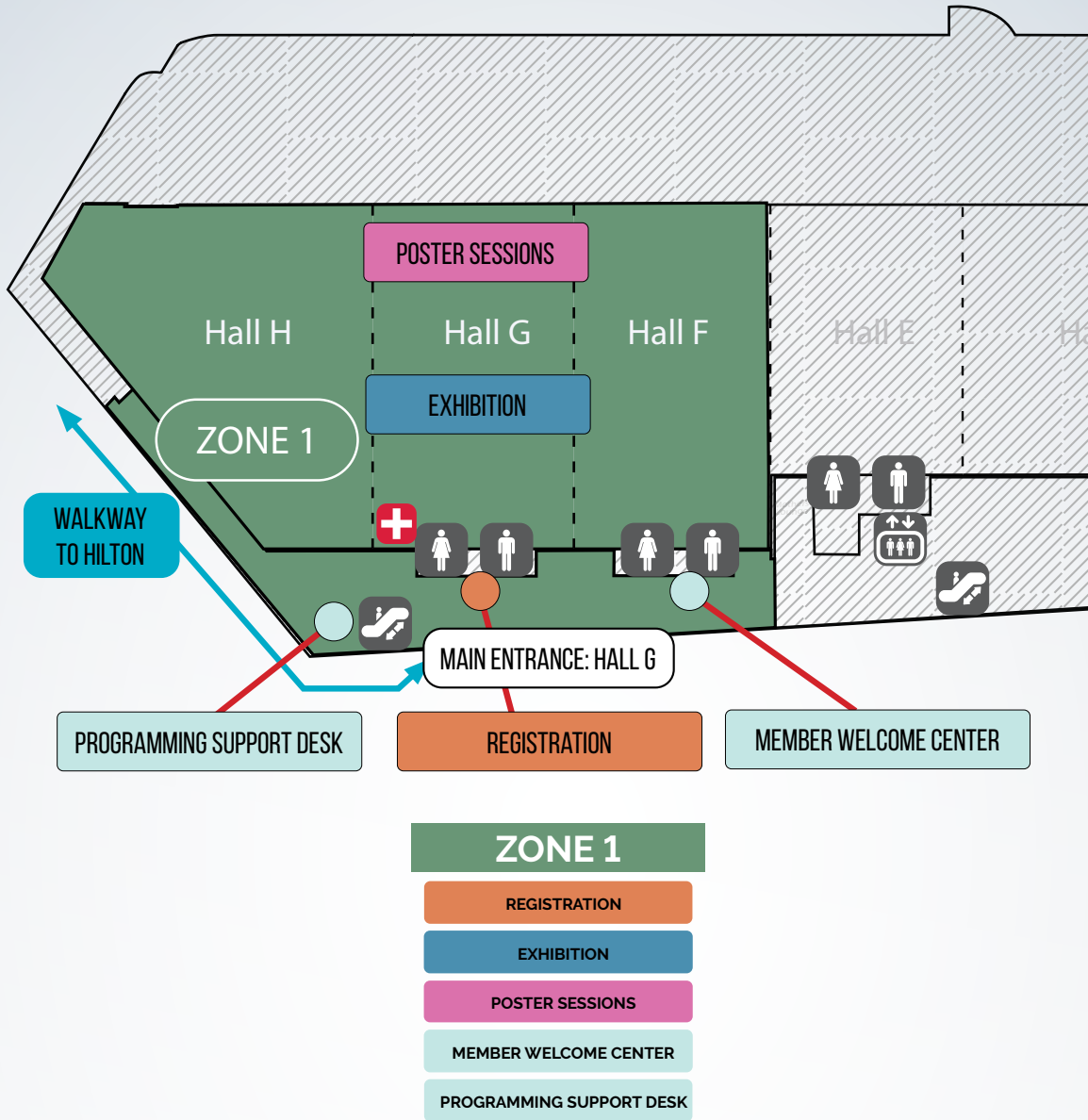


Scan for more information  
[zeiss.ly/630Versa\\_TMS](https://zeiss.ly/630Versa_TMS)



Seeing beyond

# MAPS - SDCC GROUND LEVEL



## LEGEND

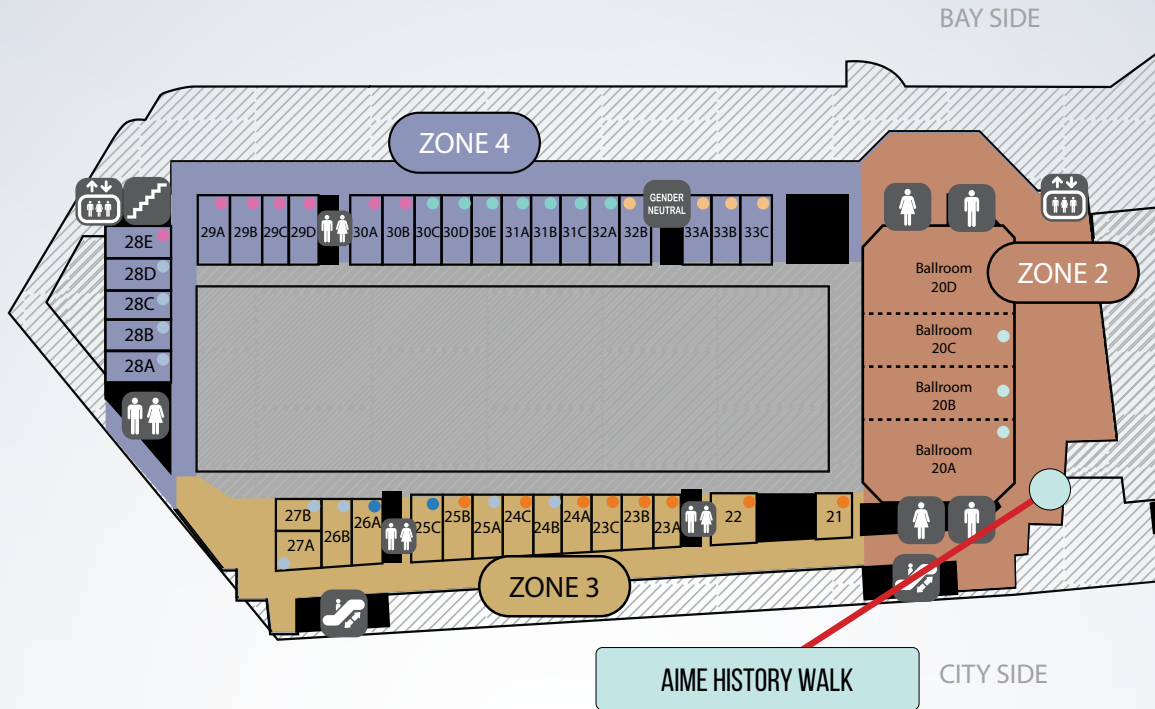
- STAIRS
- ELEVATOR
- ESCALATOR
- MOTHER'S ROOM
- RESTROOM
- GENDER NEUTRAL RESTROOM
- FIRST AID
- DEFIBRILLATOR

## BUILDING OVERVIEW





# MAPS - SDCC UPPER LEVEL

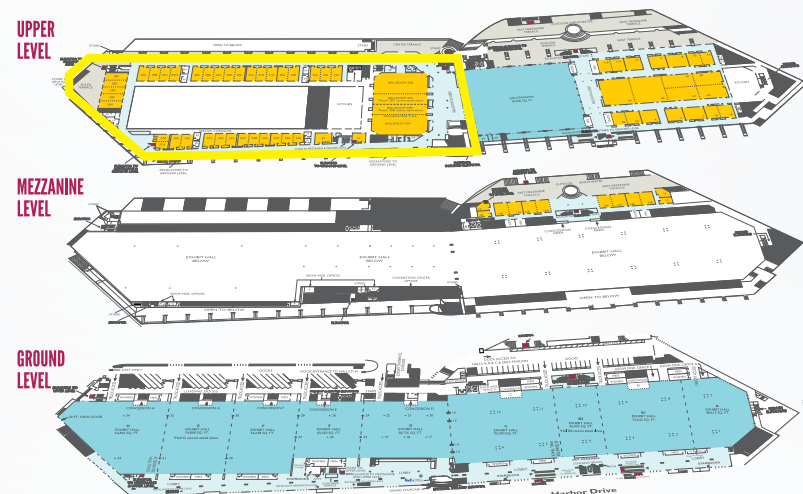


ZONE 2	ZONE 3	ZONE 4
ALL CONFERENCE PLENARY	ADDITIVE TECHNOLOGIES	NUCLEAR MATERIALS
AIME-TMS AWARDS CEREMONY	NUCLEAR MATERIALS	MATERIALS PROCESSING
MATERIALS BOWL	PHYSICAL METALLURGY	LIGHT METALS
		ENERGY & ENVIRONMENT

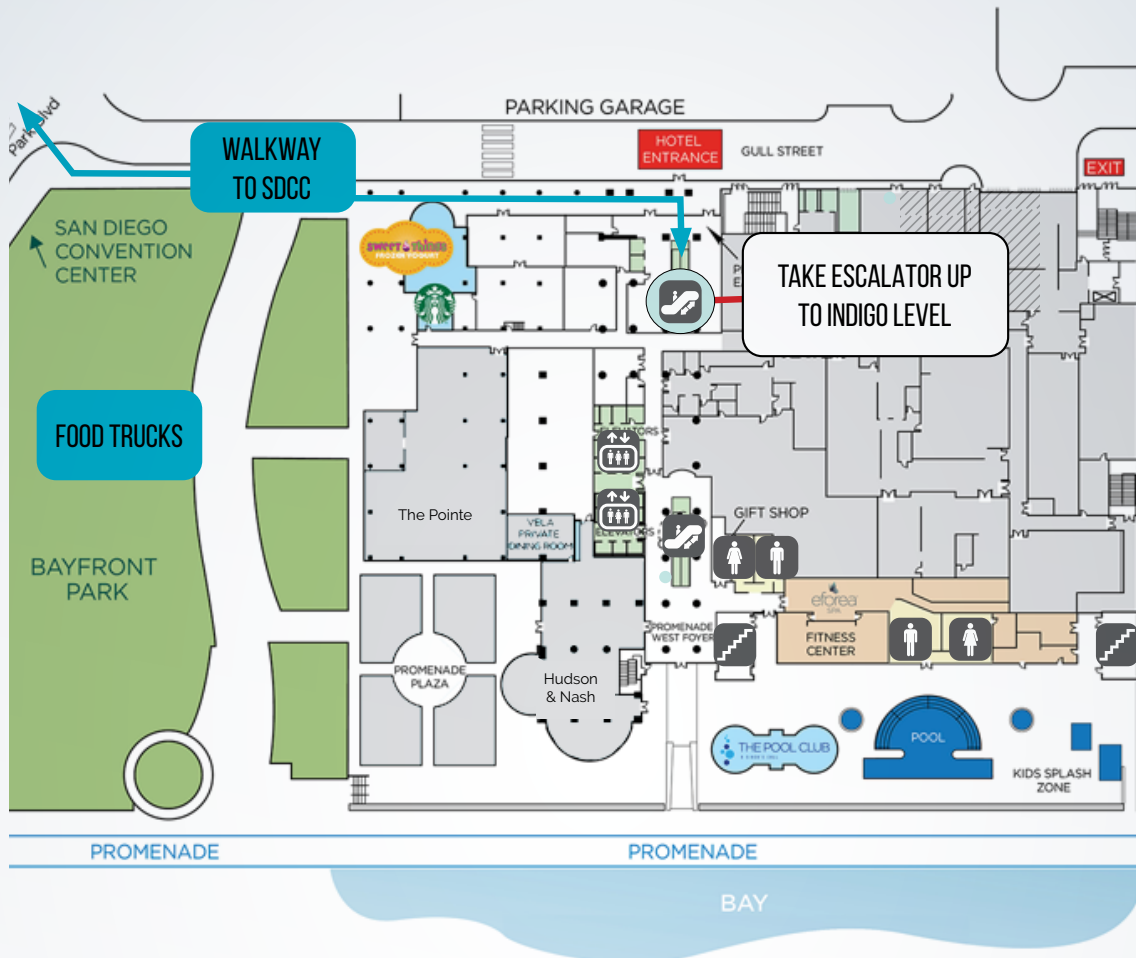
## LEGEND

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

## BUILDING OVERVIEW



# MAPS - HILTON BAYFRONT: STREET LEVEL

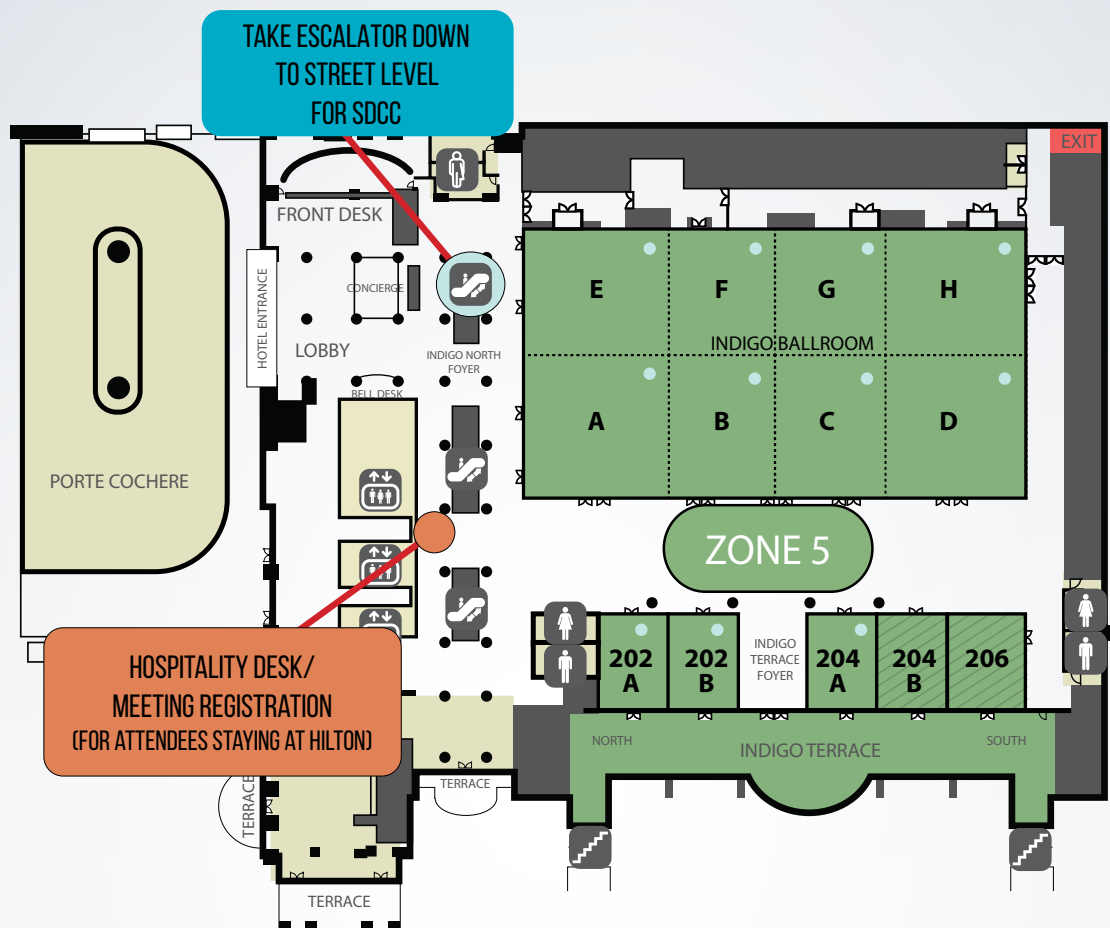


NO PROGRAMMING

## LEGEND



# MAPS - HILTON BAYFRONT: INDIGO LEVEL



## ZONE 5

SOCIETY FUNCTIONS

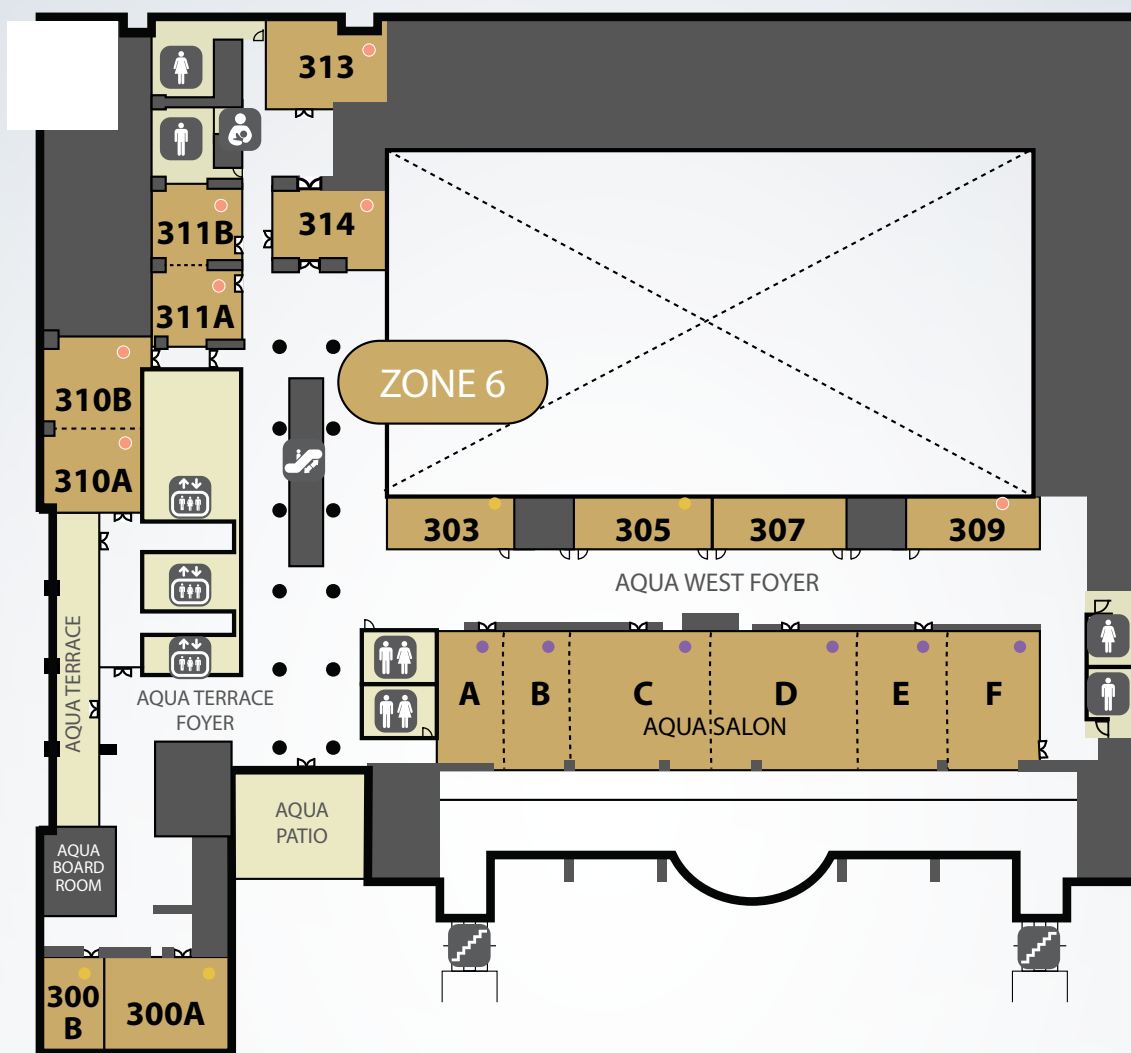
COMMITTEE MEETINGS

### LEGEND





# MAPS - HILTON BAYFRONT: AQUA LEVEL



## ZONE 6

NANOSTRUCTURE MATERIALS & HETEROSTRUCTURED MATERIALS

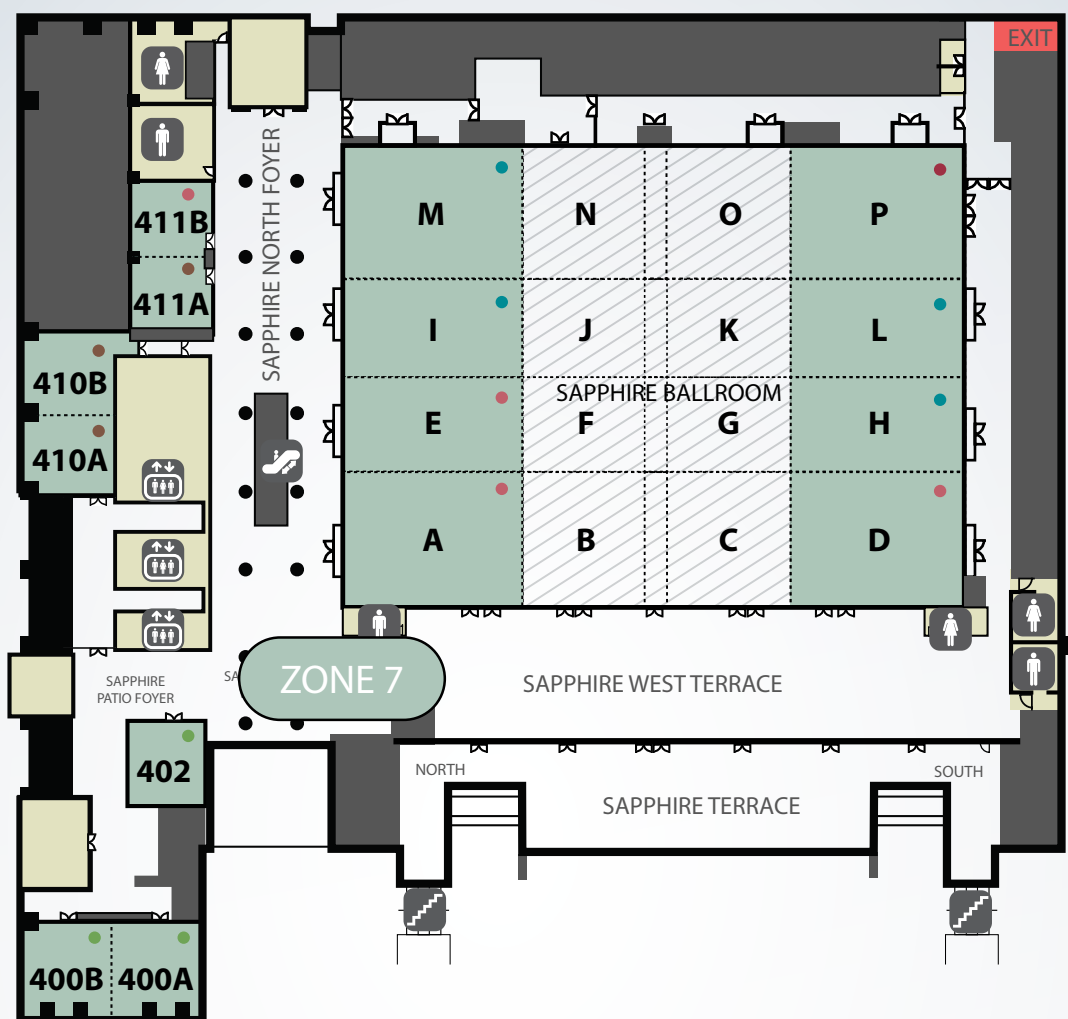
CHARACTERIZATION

ADVANCED MATERIALS

## LEGEND



# MAPS - HILTON BAYFRONT: SAPPHIRE LEVEL



## ZONE 7

BIOMATERIALS

CORROSION

ELECTRONIC MATERIALS

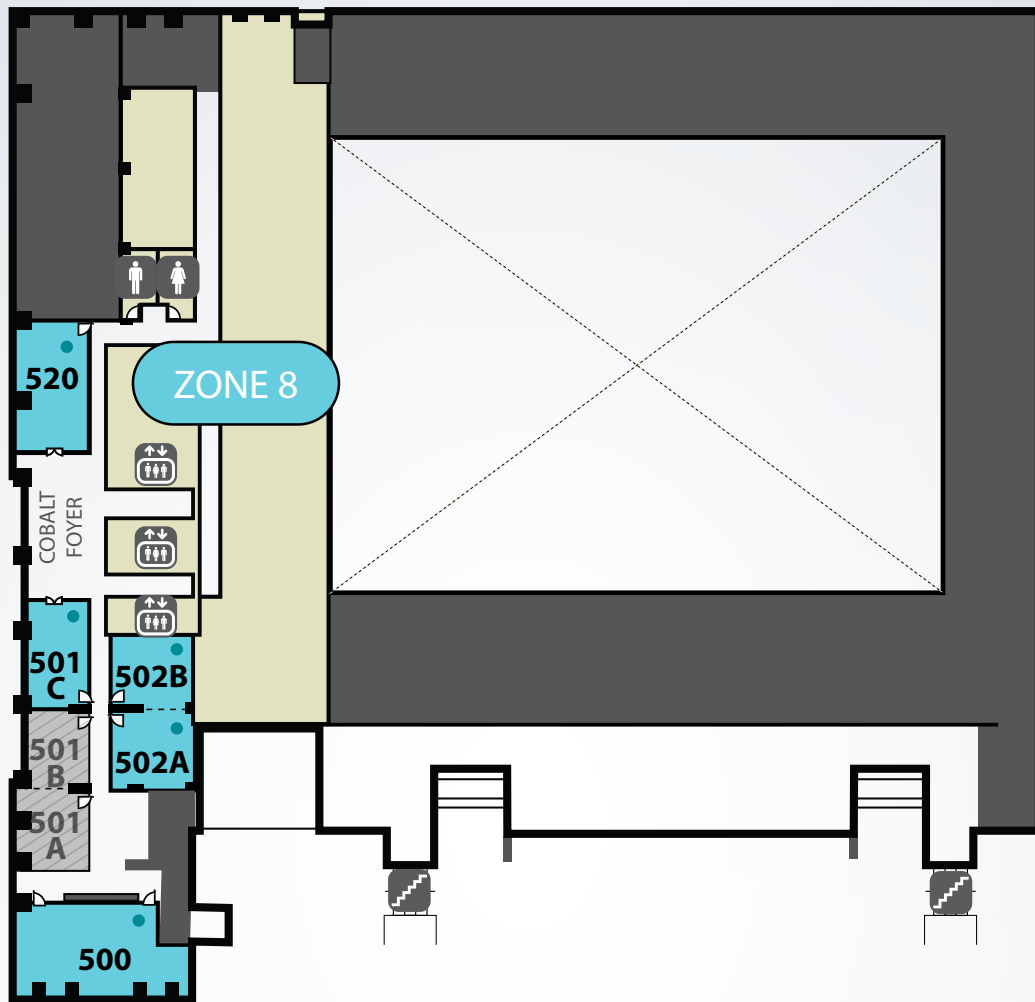
MATERIALS DESIGN

MECHANICS & STRUCTURAL  
RELIABILITY

## LEGEND



# MAPS - HILTON BAYFRONT: COBALT LEVEL



## ZONE 8

MATERIALS DESIGN

### LEGEND

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



# MAPS - HOTELS NEAR SAN DIEGO CONVENTION CENTER



## HOTELS

- 1 Grand Hyatt San Diego
- 2 Marriott Marquis San Diego Marina
- ★ 3 Hilton San Diego Bayfront (TMS HQ Hotel)
- ★ 4 Omni San Diego Hotel (TMS Hotel)
- 5 Andaz San Diego
- 6 Best Western Plus Bayside Inn
- 7 The Bristol Hotel
- 8 Carté Hotel & Suites San Diego
- 9 Comfort Inn Gaslamp Convention Center
- 10 Courtyard San Diego Downtown
- 11 Courtyard San Diego Downtown Gaslamp
- 12 DoubleTree by Hilton San Diego Downtown
- ★ 13 Embassy Suites San Diego Bay (TMS Hotel)
- 14 Four Points by Sheraton San Diego Downtown

## ROOMS

- 1,628 15 The Guild San Diego
- 1,360 16 Hampton Inn by Hilton San Diego - Downtown
- 1,190 17 Hard Rock Hotel San Diego
- 511 18 Hilton Garden Inn/Homewood Suites
- 159 ★ 19 Hilton San Diego Gaslamp Quarter (TMS Hotel)
- 122 20 Holiday Inn Express San Diego Downtown
- 102 21 Horton Grand Hotel
- 239 22 Hotel Indigo San Diego Gaslamp Quarter
- 103 23 Hotel Republic
- 245 24 Hotel Z
- 90 25 InterContinental San Diego
- 333 26 Kimpton Hotel Palomar San Diego
- 337 27 Solamar San Diego
- 220 28 Moxy San Diego Gaslamp Downtown

- 163 29 The Pendry
- 177 30 Porto Vista Hotel
- 420 31 Ramada - Gaslamp/Convention Center
- 204/160 32 Residence Inn San Diego Downtown
- 283 33 Residence Inn San Diego Downtown/Gaslamp Quarter
- 148 34 San Diego Marriott Gaslamp Quarter
- 132 35 The Sofia Hotel
- 210 36 SpringHill Suites/Residence Inn Bayfront
- 258 37 TownePlace Suites by Marriott San Diego Downtown
- 96 38 The US GRANT - A Luxury Collection Hotel
- 400 39 The Westgate Hotel
- 183 40 The Westin San Diego
- 235 41 The Westin San Diego Gaslamp Quarter
- 126 42 Wyndham San Diego Bayside
- 317
- 189
- 99
- 121
- 240
- 306
- 211
- 253/147
- 98
- 270
- 223
- 436
- 450
- 600



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58 Ce 140.116 Cerium	59 Pr 140.90765 Praseodymium	60 Nd 144.242 Neodymium	61 Pm (145) Promethium	62 Sm 150.36 Samarium	63 Eu 151.964 Europium	64 Gd 157.25 Gadolinium	65 Tb 158.92535 Terbium	66 Dy 162.5 Dysprosium	67 Ho 164.93032 Holmium	68 Er 167.259 Erbium	69 Tm 168.93421 Thulium	70 Yb 173.054 Ytterbium	71 Lu 174.9668 Lutetium
90 Th 232.0376 Thorium	91 Pa 231.0368 Protactinium	92 U 238.02891 Uranium	93 Np (237) Neptunium	94 Pu (244) Plutonium	95 Am (243) Americium	96 Cm (247) Curium	97 Bk (247) Berkelium	98 Cf (251) Californium	99 Es (252) Einsteinium	100 Fm (257) Fermium	101 Md (258) Mendelevium	102 No (259) Nobelium	103 Lr (262) Lawrencium

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# 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 TMS2023 facilities available beginning on page 5 of this conference guide and on the TMS2023 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 San Diego Convention Center

### Emergency Contacts

If you experience a security or medical emergency and need to call for help, choose one of the following options:

- Dial extension 5911 from any white house phone located within the Convention Center public areas
- Dial 1-619-525-5911 from your mobile phone

### Convention Center Security

The main Security office is located on the ground level, dock side, behind Exhibit Hall C. Security staff are on duty 24 hours a day, 7 days a week, including a Public Safety Supervisor or Manager. Some of their services include:

- Basic first aid, CPR/AED, fire extinguisher use, and bleeding control
- Security and medical first response emergency services
- Access control to the front driveway and loading docks
- Interior & exterior building patrol
- 24-Hour Dispatch Center

### What to Do if the Fire Alarm Activates

- Do not evacuate unless there are obvious signs of danger or fire
- Listen for an announcement that the alarm is being investigated
- If evacuation is not needed, a follow-up announcement will be made to advise that the alarm has been cleared and you may continue your activities
- If evacuation is needed, leave the building through the nearest exit and go to one of three dedicated evacuation assembly areas

## At the Hilton San Diego Bayfront

### Emergency Contacts

If you experience a security or medical emergency and need to call for help, choose one of the following options:

- Dial #55 from any house phone located within the hotel
- Dial 1-619-321-4238 from your mobile phone

### Evacuation Information

In the event of a fire or other emergency which requires evacuation, evacuate the building immediately through the nearest exit. The hotel's evacuation rally point is on the park lawn in front of the hotel.

## WHERE TO FIND HEALTH CARE

A listing of local hospitals, urgent care centers, and pharmacies is available through the TMS2023 App and in the Attendee Toolbox section of [www.tms.org/TMS2023](http://www.tms.org/TMS2023).



# REGISTRATION AND HELP DESKS

## Registration Desk Information

### General Registration

The Registration Desk is located in the Hall G Pre-Function area of the San Diego Convention Center and will be open Sunday through Thursday. (View operating hours in the Calendar of Events or the TMS2023 App.)

### Registration for Hilton Guests

Guests staying at the Hilton San Diego Bayfront can pick up their registration badges at the registration desk located at the Indigo Lobby Light Wall, Sunday through Wednesday.

### Registration Badges

The TMS2023 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:

- Sunday Night Welcome Reception
- Monday Morning Welcome Breakfast
- More than 99 symposia in 14 technical tracks
- Featured keynote presentations, honorary symposia, special award lectures, and poster sessions
- All-conference plenary session, featuring David T. Danielson, Breakthrough Energy Ventures
- A three-day pass to the TMS2023 Exhibit Hall
- Exhibit Hall Opening Reception and Poster Session I
- Exhibit Hall Happy Hour and Poster Session II
- 2023 TMS-AIME Awards Ceremony
- Electronic access to proceedings from select symposia, as well as the general meetings proceedings volume

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.

### 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 TMS2023 registration desks at the convention center or the Hilton for a fee of \$25.

## Help Desks

For additional assistance during TMS2023, visit the following information booths.

### TMS Member Welcome Center

Visit the TMS Member Welcome Center to learn more about your TMS membership or your Material Advantage student membership or to ask general questions about TMS2023. Not a member? If you registered for TMS2023 at the non-member registration rate, 2023 TMS membership is included with your registration. Find out how you can use your new membership by visiting the booth.

The TMS Member Welcome Center is located in the Hall F Pre-Function area of the San Diego Convention Center. See the Calendar of Events or app for Member Welcome Center hours.

### Programming and App Support Desks

Speakers, organizers, and session chairs can find answers to their questions about technical programming and all attendees can get help downloading and using the TMS2023 App at one of the Programming and App Support Desks, located in the Hall H pre-function area at the San Diego Convention Center and in the Aqua Foyer at the Hilton San Diego Bayfront. Both locations will be open on Sunday from 2:00 p.m. to 7:00 p.m. and Monday through Thursday from 7:00 a.m. to 6:00 p.m.

## TMS ( MEMBER BENEFITS

Did you register for TMS2023 as a nonmember? Then your registration includes a 2023 professional membership in TMS! Visit the TMS Member Welcome Center for information about your member benefits and how to begin accessing them.

# FOOD TRUCKS, RESTAURANTS, AND BUSINESS SERVICES

## Lunch Food Trucks

Enjoy lunch outdoors from a variety of food vendors.

**Location:** Bayfront Park (located between the San Diego Convention Center and the Hilton San Diego Bayfront)

**Hours:** Monday: 11:30 a.m. to 2:00 p.m.

Tuesday: Noon to 2:30 p.m.

Wednesday: 11:30 a.m. to 2:00 p.m.

## Convention Center Concession Locations

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

### Starbucks

**Location:** Lobby E & Lobby C

**Hours:** Monday through Thursday  
7:00 a.m. to 2:00 p.m.

### Concession Stand

**Location:** TMS2023 Exhibit Hall (Hall F)

**Hours:** Monday through Thursday  
11:30 a.m. to 2:30 p.m.

### Water Fill Stations

The San Diego Convention Center offers water bottle fill stations throughout the facility for your reusable water bottles.

## Additional Convention Center Information

### Recycling

4-stream waste receptacles are located throughout the San Diego Convention Center to allow for recycling.

### Hand Sanitizer Stations

Hand sanitizer stations are available throughout the convention center for attendees' convenience.

### Cashless Transactions Only

The San Diego 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.

### ATM Locations

ATMs (automated teller machines) are located in Lobby B and Lobby E in the San Diego Convention Center for attendees who need to withdraw cash.

## Charging Stations

Keep those battery levels up during your breaks with 23 charging stations located throughout the lower-level lobbies.

## Hilton San Diego Bayfront Dining Options

### Hudson & Nash

Open daily from 6:30 a.m. to 10:00 p.m. for breakfast, lunch, and dinner. *TMS guests staying at the Hilton Bayfront receive a daily 20% discount off the breakfast buffet*

### The Pool Club

The poolside lounge is open daily from 8:00 a.m. to 6:00 p.m. for breakfast, lunch, and dinner. Mobile pick-up dining options are available.

### Odysea

Indoor and outdoor dining along the water opens at 2:00 p.m. daily for lunch and dinner.

### The Cannery Market & Supply

Open daily from 6:00 a.m. to midnight, this eatery offers fresh grab-and-go options and mobile pick-up ordering and services.

### Sweet Things Frozen Yogurt

Sweet Things is open daily from 7:00 a.m. to 9:00 p.m. and serves smoothies, frozen yogurt, Acai bowls, and more.

### Starbucks

Starbucks is open daily from 6:00 a.m. to 4:00 p.m. on the Promenade level of the Hilton.

## Business Services

A FedEx Office business center, located in Lobby D of the **San Diego Convention Center**, offers shipping, mailing, printing, and other business services to attendees for a fee.

A UPS store is located on the 3rd floor, Aqua Level, of the **Hilton San Diego Bayfront**. They provide printing, copying, shipping, and receiving services and have a small shop of office supplies.

## Free Proceedings Access

TMS2023 attendees in most registration classes receive free online access to the complete collection of proceedings publications. To access the proceedings publications, visit [www.tms.org/TMS2023proceedings](http://www.tms.org/TMS2023proceedings). Enter your email address and TMS2023 Registration ID# (usually formatted as 23-xxxx including the hyphen).

Please note that complimentary proceedings content must be downloaded by April 30, 2023, at which time standard pricing will take effect.

## Individual Volumes for Purchase

TMS members receive a 40% discount off hard copies of the TMS2023 proceedings volumes presented on this page. These books will be available for purchase at the Springer Nature Publications booth, located in the foyer of Hall F and G in the San Diego Convention Center.

Visit the online TMS Bookstore at [www.tms.org/Bookstore](http://www.tms.org/Bookstore) to search the complete inventory of available TMS publications, including past proceedings volumes.

## TMS2023 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 TMS2023:

- *Advances in Powder and Ceramic Materials Science 2023*
- *Advances in Pyrometallurgy: Developing Low Carbon Pathways*
- *Characterization of Minerals, Metals, and Materials 2023*
- *Energy Technology 2023: Carbon Dioxide Management and Other Technologies*
- *Friction Stir Welding and Processing XII*
- *Light Metals 2023*
- *Magnesium Technology 2023*
- *Materials Processing Fundamentals 2023*
- *New Directions in Mineral Processing, Extractive Metallurgy, Recycling and Waste Minimization: An EPD Symposium in Honor of Patrick R. Taylor*
- *Rare Metal Technology 2023*
- *TMS 2023 152nd Annual Meeting & Exhibition Supplemental Proceedings*





# TMS

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**TMS and Material Advantage 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.

## 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.

## 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.

## Refund Policy

The deadline for all refunds was January 31, 2023. 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 2022-2023 TMS BOARD OF DIRECTORS

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### Light Metals Division Director/Chair



**Edward Williams**  
Manager, Molten  
Metal Group, Arconic  
Technology Center

### Materials Processing & Manufacturing Division Director/Chair



**Paul Mason**  
President, Thermo-Calc  
Software Inc.

### Structural Materials Division Director/Chair



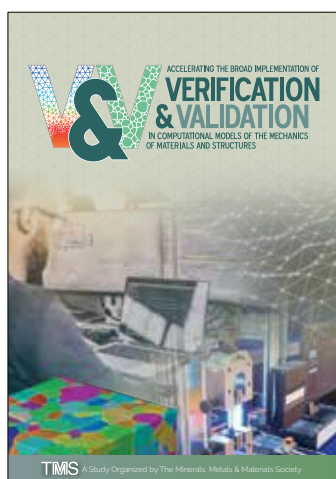
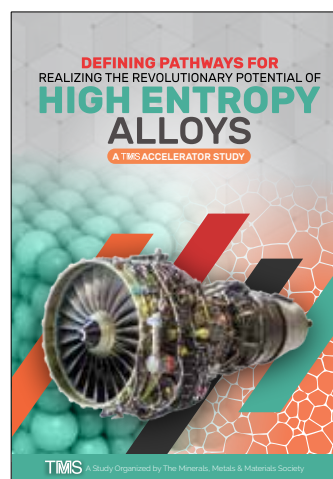
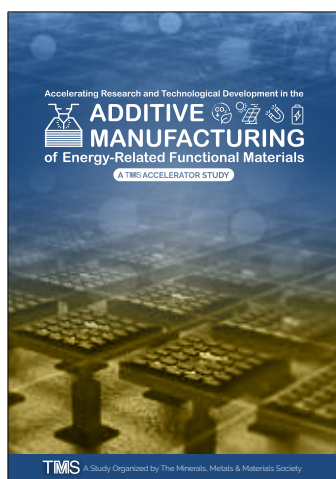
**Suveen Mathaudhu**  
Professor, Colorado  
School of Mines



# TMS STUDIES

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

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# TMS2023 ALL-CONFERENCE PLENARY

## "Gigaton Opportunities at the Intersection of Materials and Climate Technology"

**Date:** Tuesday, March 21, 2023

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

**Location:** San Diego Convention Center, Ballroom 20 ABC

### Featured Speaker:



**David T. Danielson**

Managing Director, Breakthrough Energy Ventures  
Former U.S. Assistant Secretary of Energy Efficiency & Renewable Energy (EERE)

### About the Presentation

Solving climate change is the greatest challenge of our time. In this talk, Danielson will discuss big (Gigaton scale) opportunities and white space at the intersection of materials and climate technology: from decarbonizing cement and steel, to building 1,000-hour batteries for seasonal storage of wind and solar energy . . . and everything in between.

### About the Presenter

**David T. Danielson** is co-founder and managing director of Breakthrough Energy Ventures, a \$2 billion+ climate-technology venture capital investment firm created and led by Bill Gates. He is also an adjunct professor at Stanford University, where he created and teaches Stanford Climate Ventures, a climate-technology startups class that has resulted in the launch of 38 new climate-technology startups which have collectively raised \$500 million in capital. He also served as assistant secretary of the U.S. Department of Energy's (DOE) Office of Energy Efficiency & Renewable Energy (EERE), where he led the largest government clean-energy innovation funding agency in the world.

At EERE, he directed the U.S. government's innovation strategy in the areas of sustainable transportation, renewable power, energy efficiency, and clean-energy manufacturing, directing investments of about \$10 billion during his four-year tenure. Prior to serving as assistant secretary of EERE, Danielson was founder and employee #1 at the DOE's Advanced Research Projects Agency – Energy (ARPA-E), a government funding agency that focuses on the development of high-risk, high-reward clean-energy technologies. Prior to his government service, he was a clean-energy venture capitalist at General Catalyst. He holds a Ph.D. from the Massachusetts Institute of Technology and bachelor's degree from the University of California, Berkeley, both in materials science and engineering.

In addition to serving as the TMS2023 All-Conference Plenary speaker, Danielson is the 2023 recipient of the TMS Sadoway Materials Innovation and Advocacy Award.

## ALL ATTENDEES WELCOME

TMS2023 technical programming sessions begin at 8:00 a.m. on Tuesday, March 21, and end at 6:00 p.m. so that all TMS2023 attendees can participate in this all-conference plenary together on Tuesday at noon. No other technical programming will be held at this time.

Technical programming sessions will run from 8:30 a.m. to 5:30 p.m. on Monday, Wednesday, and Thursday.



# FEATURED SESSIONS AND LECTURES

## Featured Sessions

Throughout the week, TMS2023 will hold featured sessions of invited presentations.



Visit [www.tms.org/TMS2023/FeaturedSessions](http://www.tms.org/TMS2023/FeaturedSessions) or scan this QR code to learn more about scheduled presenters and their topics.

## Keynote and Award Sessions

This year's featured sessions include:

### Light Metals Keynote Session

Monday, March 20, 8:30 a.m. to 12:30 p.m.  
San Diego Convention Center, Room 20A

### Magnesium Technology Keynote Session

Monday, March 20, 8:30 a.m. to Noon  
San Diego Convention Center, Room 30C

### Additive Manufacturing Keynote Session

Monday, March 20, 2:00 p.m. to 5:00 p.m.  
San Diego Convention Center, Room 20A

### Acta Materialia Symposium

Tuesday, March 21, 2:30 p.m.  
Hilton San Diego Bayfront, Sapphire Level, Ballroom D

### Nix Award and Lecture Symposium IV

Wednesday, March 22, 8:30 a.m. to Noon  
Hilton San Diego Bayfront, Sapphire Level, Ballroom D

## Frontiers of Materials Symposia

As part of the TMS Frontiers of Materials Award program, three top-performing early-career professionals have organized symposia on hot or emergent technical topics and will deliver keynote talks during their symposia.

### Ultra-Wide Bandgap Materials and Heterostructures for Next Generation Power, RF, and Quantum Applications



**Keynote Presentation:** Tuesday, March 21, 2:30 p.m.

**Location:** Hilton San Diego Bayfront, Aqua Level, Room 309

**Keynote Speaker:** Yuji Zhao, Rice University

### Functional Composition Control of Surface Mechanics in Soft, Water-Swollen Gels



**Keynote Presentation:** Wednesday, March 22, 2:00 p.m.

**Location:** Hilton San Diego Bayfront, Sapphire Level, Ballroom D

**Keynote Speaker:** Alison Dunn, University of Illinois Urbana-Champaign

### Intermetallic Alloys at the Edge of Complexity: Structural and Kinetic Aspects



**Keynote Presentation:** Wednesday, March 22, 2:00 p.m.

**Location:** San Diego Convention Center, Room 28C

**Keynote Speaker:** Ashwin Shahani, University of Michigan

## ANNOUNCING THE 2023 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 2023 Annual Meeting of the Membership, with an open Board of Directors Meeting, on Thursday, March 23, 2023, from 8:00 a.m. to 8:30 a.m. (Pacific Daylight Time) at the Hilton San Diego Bayfront Hotel, Indigo 204A during the TMS 2023 Annual Meeting & Exhibition. All TMS members are welcome to attend this meeting.

# FEATURED SESSIONS AND LECTURES



## Honorary Symposia

The following symposia will honor distinguished TMS members who have contributed to all aspects of minerals, metals, and materials science and engineering.



Easo George

### Alloy Behavior and Design Across Length-Scales: An SMD Symposium Honoring Easo George

Monday, March 20, and Tuesday, March 21  
Hilton San Diego Bayfront, Cobalt 502B



Jonathan A. Dantzig

### Frontiers in Solidification: An MPMD Symposium Honoring Jonathan A. Dantzig

Monday, March 20, through  
Wednesday, March 22  
San Diego Convention Center, Room 28E



Zi-Kui Liu

### Materials Genome, CALPHAD, and a Career over the Span of 20, 50, and 60 Years: An FMD/SMD Symposium in Honor of Zi-Kui Liu

Monday, March 20, through  
Wednesday, March 22  
Hilton San Diego Bayfront, Sapphire L



Patrick R. Taylor

### New Directions in Mineral Processing, Extractive Metallurgy, Recycling, and Waste Minimization: An Extraction & Processing Division Symposium in Honor of Patrick R. Taylor

Monday, March 20, through  
Thursday, March 23  
San Diego Convention Center, Room 33C



Barry J. Welch

### 60 Years of Taking Aluminum Smelting Research and Development from New Zealand to the World: An LMD Symposium in Honor of Barry J. Welch

Tuesday, March 21, and  
Wednesday, March 22  
San Diego Convention Center, Room 30E

## Special Lectures

Invited luncheon talks, award lectures, and other featured presentations are planned throughout the week at TMS2023.



Visit [www.tms.org/TMS2023/SpecialLectures](http://www.tms.org/TMS2023/SpecialLectures) or scan this QR code to learn more about these special lectures.

## Luncheon Lectures

### Structural Materials Division/Functional Materials Division Luncheon\*



**Speaker:** Roger Narayan, University of North Carolina and North Carolina State University

**Date:** Monday, March 20, Noon to 2:00 p.m.

**Location:** San Diego Convention Center, Room 20D

### Extraction & Processing Division/Materials Processing & Manufacturing Division Luncheon\*



**Speaker:** Paramita Das, Rio Tinto

**Date:** Tuesday, March 21,  
1:00 p.m. to 3:00 p.m.

**Location:** San Diego Convention Center, Room 20D

### Emerging Professional Tutorial Luncheon\*



**Speakers:** Danielle L. Cote, Worcester Polytechnic Institute; Grace X. Gu, University of California, Berkeley;

and Yu Zou, University of Toronto

**Date:** Tuesday, March 21, 1:15 p.m. to 2:45 p.m.

**Location:** Hilton San Diego Bayfront Hotel

### Light Metals Division Luncheon\*



**Speaker:** Slade Gardner, Big Metal Additive

**Date:** Wednesday, March 22,  
Noon to 2:00 p.m.

**Location:** San Diego Convention Center, Room 20D

\*Ticket purchase is required for lunch; presentation is free to attend.

# FEATURED SESSIONS AND LECTURES

## Award Lectures

### William Hume-Rothery Award



**Speaker:** Gerbrand Ceder, University of California, Berkeley

**Date:** Monday, March 20,  
8:30 a.m. to 9:10 a.m.

**Location:** Hilton San Diego Bayfront,  
Cobalt 501C

### Extraction & Processing Division Distinguished Lecturer



**Speaker:** Corale L. Brierley, Brierley Consultancy LLC

**Date:** Monday, March 20,  
8:45 a.m. to 9:25 a.m.

**Location:** San Diego Convention Center,  
Room 33C

### Young Innovator in the Materials Science of Additive Manufacturing Award Lecture



**Speaker:** Matteo Seita, University of Cambridge

**Date:** Monday, March 20,  
4:20 p.m. to 4:55 p.m.

**Location:** San Diego Convention Center,  
Room 20A

### Institute of Metals/Robert Franklin Mehl Award



**Speaker:** Carl Koch, Kobe Steel Distinguished Professor, North Carolina State University

**Date:** Tuesday, March 21,  
2:30 p.m. to 3:00 p.m.

**Location:** Hilton San Diego Bayfront, Aqua D

### William D. Nix Award Lecturer



**Speaker:** Eduard Arzt, Leibniz Institute for New Materials and Saarland University

**Date:** Wednesday, March 22,  
8:30 a.m. to 9:30 a.m.

**Location:** Hilton San Diego Bayfront,  
Sapphire D

## ATTEND THE TMS-AIME AWARDS CEREMONY

Support the 2023 TMS award recipients and help us recognize their accomplishments. Attend the **TMS-AIME Awards Ceremony** on Wednesday, March 22, from 6:00 p.m. to 7:30 p.m. in the San Diego Convention Center, Room 20A.





# NETWORKING EVENTS

## Networking Events

Make time in your schedule to attend these social and networking events that allow you to connect with fellow attendees.



Visit [www.tms.org/TMS2023/NetworkingEvents](https://www.tms.org/TMS2023/NetworkingEvents) or scan this QR code for more details on each of these networking events.

### Welcome Reception

Sunday, March 19, 7:00 p.m. to 8:00 p.m.  
San Diego Convention Center, Hall F

### LGBTQ+ and Allies Networking Mixer

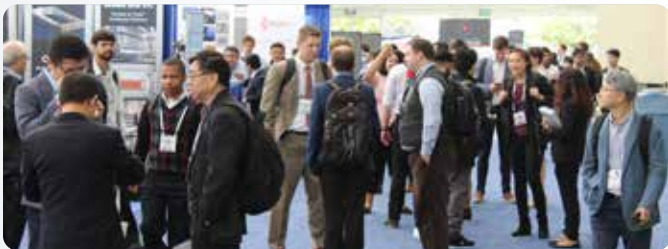
Sunday, March 19, 8:00 p.m. to 10:00 p.m.  
San Diego Convention Center, Room 20D

### Welcome Breakfast



Monday, March 20, 7:00 a.m. to 8:30 a.m.  
San Diego Convention Center, Hall F

### Exhibit Opening Reception and Poster Session I

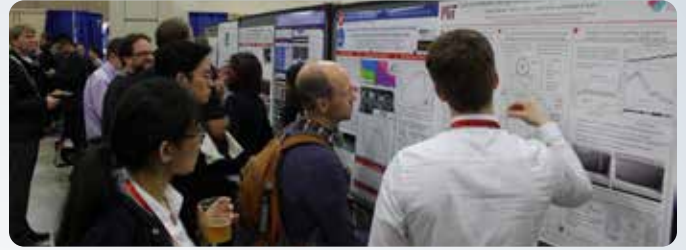


Monday, March 20, 5:30 p.m. to 6:30 p.m.  
San Diego Convention Center, Hall G

### PubZone Networking Reception\*

Monday, March 20, 6:00 p.m. to 7:30 p.m.  
The Deck at Moonshine Flats (Offsite Location)

### Exhibit Hall Happy Hour and Poster Session II



Tuesday, March 21, 5:30 p.m. to 6:30 p.m.  
San Diego Convention Center, Hall G

### Professor Patrick R. Taylor Honorary Symposium Dinner\*

Tuesday, March 21, 6:30 p.m. to 9:30 p.m.  
Check the TMS2023 App for Location

### Fresh Coffee, Fresh Ideas: Diversity and Inclusion Breakfast\*



Wednesday, March 22, 7:00 a.m. to 8:15 a.m.  
Hilton San Diego Bayfront, Indigo E

### 2023 TMS-AIME Awards Ceremony & Reception\*\*



Wednesday, March 22, 5:30 p.m. to 7:30 p.m.  
San Diego Convention Center, Center Terrace (Reception)  
San Diego Convention Center, Room 20A (Ceremony)

\* Ticket purchase is required. \*\*Ticket purchase is required for reception; ceremony is free to attend.





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# STUDENT AND EMERGING PROFESSIONAL EVENTS

## Student Events

TMS2023 will feature the following events designed specifically for undergraduate and graduate students.



Visit [www.tms.org/TMS2023/StudentEvents](http://www.tms.org/TMS2023/StudentEvents) or scan this QR code for more details on these student events.

## TMS Materials Bowl and Networking Reception



**Date:** Sunday, March 19, 2023

**Competition Time:** 4:30 p.m. to 6:00 p.m.

**Networking Reception Time:** 6:00 p.m. to 7:00 p.m.

**Location:** San Diego Convention Center, Room 20AB

## Technical Divisions Student Poster Showing and Judging

**Date:** Monday, March 20

**Time:** 5:00 p.m. to 6:30 p.m.

**Location:** San Diego Convention Center, Hall G (Exhibit Hall)

## 2023 Bladesmithing Symposium

**Date:** Tuesday, March 21

**Time:** 8:30 a.m. to 4:30 p.m.

**Location:** Hilton San Diego Bayfront, Sapphire I

## Student Career Forum

**Date:** Tuesday, March 21

**Time:** 3:00 p.m. to 4:30 p.m.

**Location:** Hilton San Diego Bayfront Hotel, Indigo A

## NEW! Ace the Job Hunt Workshop

**Date:** Tuesday, March 21

**Time:** 5:00 p.m. to 6:30 p.m.

**Location:** Hilton San Diego Bayfront Hotel, Indigo A

## Emerging Professional Events

TMS2023 will feature the following events designed specifically for early-career professionals and recent graduates.

## Emerging Professionals Committee Meeting

Tuesday, March 21, 7:30 a.m. to 9:00 a.m.

Hilton San Diego Bayfront Hotel, Indigo H

## Emerging Professional Tutorial Luncheon Lecture

Tuesday, March 21, 1:15 p.m. to 2:45 p.m.

Hilton San Diego Bayfront Hotel, Indigo A

*Note: Tickets must be purchased in advance to receive lunch, but the lecture is free for all to attend.*

## JOIN US FOR TUESDAY'S BLADESMITHING SYMPOSIUM



### FEATURING:

**"This is the Way - Discovering the Secrets of Beskar Metallurgy"**

*Suveen Mathaudhu,*  
Colorado School of Mines

**Tuesday, March 21, 3:35 p.m.**

Hilton San Diego Bayfront Hotel, Sapphire I

In the Star Wars universe there is no metal or alloy that compares to Beskar, the legendary "iron" of the Mandalorian tribes. In this presentation, we will step into a galaxy far far away to learn about the history of Beskar metalworking and contemplate some real-world metal-processing discoveries that may explain the seemingly magical behaviors of Beskar and its alloys.



**Read more on this topic in the December 2022 issue of JOM: The Magazine.**

# CALENDAR OF EVENTS

Event/Function Name	Start	End	Access	Venue	Room
<b>Sunday, March 19, 2023</b>					
<b>All-Conference Events</b>					
Sunday AIME History Display	7:00 a.m.	7:00 p.m.	O	SDCC	20A Foyer
Sunday Registration at the Convention Center	7:00 a.m.	7:00 p.m.	O	SDCC	Hall G Pre-Function
Sunday Registration at the Hilton	7:00 a.m.	7:00 p.m.	O	Hilton	Indigo Lobby Light Wall
Sunday First Aid	7:00 a.m.	10:00 p.m.	O	SDCC	Hall G
Sunday Springer Nature Publications Booth	8:00 a.m.	6:00 p.m.	O	SDCC	Box Office G
Sunday Member Welcome Center	2:00 p.m.	6:00 p.m.	O	SDCC	Hall F Pre-Function
Sunday Programming & App Support Desk at the Convention Center	2:00 p.m.	7:00 p.m.	O	SDCC	Hall H Pre-Function
Sunday Programming & App Support Desk at the Hilton	2:00 p.m.	7:00 p.m.	O	Hilton	Aqua Foyer
<b>Committee and Council Meetings</b>					
TMS Board of Directors' Meeting	8:00 a.m.	1:30 p.m.	I	Hilton	Aqua D
Accreditation Committee Meeting	12:30 p.m.	2:30 p.m.	I	Hilton	Indigo 204A
TMS Nominating Committee	1:30 p.m.	3:30 p.m.	R	Hilton	Indigo D
Recycling & Environmental Technologies Committee Meeting	1:30 p.m.	3:00 p.m.	O	Hilton	Indigo C
Magnesium Committee Meeting	1:30 p.m.	3:00 p.m.	O	Hilton	Sapphire I
Technical Division Council (TDC) Meeting	2:00 p.m.	3:30 p.m.	I	Hilton	Aqua Boardroom
Aluminum Committee Meeting	2:00 p.m.	4:00 p.m.	O	Hilton	Indigo E
Materials Characterization Committee Meeting	2:30 p.m.	4:00 p.m.	O	Hilton	Indigo 204B
Pyrometallurgy Committee Meeting	3:00 p.m.	4:30 p.m.	O	Hilton	Indigo A
PRICM 11 Organizing Committee	3:30 p.m.	4:30 p.m.	I	Hilton	Indigo B
TMS Program Committee Meeting	4:00 p.m.	6:00 p.m.	I	Hilton	Indigo H
Hydrometallurgy & Electrometallurgy Committee Meeting	4:00 p.m.	5:00 p.m.	O	Hilton	Indigo C
Process Technology & Modeling Committee Meeting	5:00 p.m.	6:00 p.m.	O	Hilton	Indigo A
Thin Films & Interfaces Committee Meeting	5:00 p.m.	6:00 p.m.	O	Hilton	Indigo 204B
Additive Manufacturing Committee Meeting	5:30 p.m.	7:00 p.m.	O	Hilton	Sapphire E
Nanomechanical Materials Behavior Committee Meeting	6:00 p.m.	7:30 p.m.	O	Hilton	Sapphire I
Alloy Phases Committee Meeting	7:30 p.m.	9:00 p.m.	O	Hilton	Indigo A
Phase Transformation Committee Meeting	7:30 p.m.	9:00 p.m.	O	Hilton	Indigo E
Mechanical Behavior of Materials Committee Meeting	7:30 p.m.	9:00 p.m.	O	Hilton	Sapphire I
<b>Exhibition Events</b>					
Exhibitor Move-in - Sunday	8:00 a.m.	5:00 p.m.	R	SDCC	Hall G
<b>Social and Networking Events</b>					
TMS Fellows and Invited Guests Reception	4:30 p.m.	6:30 p.m.	I	Hilton	Aqua Terrace
TMS2023 Welcome Reception & Division Networking	7:00 p.m.	8:00 p.m.	O	SDCC	Hall F
LGBTQ+ and Allies Networking Mixer	8:00 p.m.	10:00 p.m.	O	SDCC	20D
<b>Student and Emerging Professional Events</b>					
TMS Materials Bowl	4:30 p.m.	6:00 p.m.	O	SDCC	20AB
TMS Materials Bowl Post-Game Networking Reception	6:00 p.m.	7:00 p.m.	O	SDCC	20AB
<b>Other</b>					
Introduction to Aluminum Electrolysis Course	8:00 a.m.	5:30 p.m.	T	SDCC	28A
Lead-Free Solders and Interconnects Workshop	8:00 a.m.	5:30 p.m.	T	SDCC	26B

Access Key: R: Restricted O: Open to all registrants I: Invitation only T: Ticketed  
 Venue Key: SDCC: San Diego Convention Center Hilton: Hilton San Diego Bayfront Both: SDCC and Hilton

# CALENDAR OF EVENTS

Event/Fuction Name	Start	End	Access	Venue	Room
Additive Manufacturing Materials and Processes Workshop	1:00 p.m.	5:30 p.m.	T	SDCC	28D
IEA Satellite Meeting on Modeling/Simulations	1:00 p.m.	4:30 p.m.	O	SDCC	26A
ABET Preparation Training	3:00 p.m.	5:00 p.m.	I	Hilton	Indigo 204A
Communications Skills Workshop: Targeted Skills and PowerPoint	3:30 p.m.	5:00 p.m.	T	SDCC	28E
<b>Monday, March 20, 2023</b>					
<b>All-Conference Events</b>					
Monday AIME History Display	7:00 a.m.	6:00 p.m.	O	SDCC	20A Foyer
Monday Registration at the Convention Center	7:00 a.m.	6:00 p.m.	O	SDCC	Hall G Pre-Function
Monday Registration at the Hilton	7:00 a.m.	6:00 p.m.	O	Hilton	Indigo Lobby Light Wall
Monday Member Welcome Center	7:00 a.m.	6:00 p.m.	O	SDCC	Hall F Pre-Function
Monday Programming & App Support Desk at the Convention Center	7:00 a.m.	6:00 p.m.	O	SDCC	Hall H Pre-Function
Monday Programming & App Support Desk at the Hilton	7:00 a.m.	6:00 p.m.	O	Hilton	Aqua Foyer
Welcome Breakfast	7:00 a.m.	8:30 a.m.	O	SDCC	Hall F
Monday First Aid	7:00 a.m.	7:00 p.m.	O	SDCC	Hall G
Monday Springer Nature Publications Booth	8:00 a.m.	6:00 p.m.	O	SDCC	Box Office G
Monday Technical Programming Sessions	8:30 a.m.	5:30 p.m.	O	Both	See Technical Program
Monday Morning Break	9:50 a.m.	10:30 a.m.	O	Both	Programming Floors
Lunch - Concessions	11:30 a.m.	2:30 p.m.	O	SDCC	Hall F
Lunch - Food Trucks	11:30 a.m.	2:00 p.m.	O	Both	Bayfront Park
Monday Afternoon Break	3:20 p.m.	4:00 p.m.	O	Both	Programming Floors
<b>Committee and Council Meetings</b>					
Membership Diversity & Development Committee Meeting	7:30 a.m.	9:00 a.m.	I	Hilton	Indigo D
Executive Committee Meeting	9:00 a.m.	11:30 a.m.	I	Hilton	Indigo 204A
Extraction & Processing Division (EPD) Council Meeting	Noon	1:30 p.m.	I	Hilton	Indigo H
Integrated Computational Materials Engineering Committee Meeting	12:15 p.m.	1:45 p.m.	O	Hilton	Sapphire L
Powder Materials Committee Meeting	1:15 p.m.	2:30 p.m.	O	Hilton	Indigo A
TMS Foundation Board of Trustees Meeting	2:00 p.m.	4:00 p.m.	I	Hilton	Indigo 204A
TMS Pride Meeting	4:00 p.m.	5:00 p.m.	O	Hilton	Indigo D
Professional Development Committee Meeting	5:30 p.m.	7:00 p.m.	I	Hilton	Indigo 204A
Superalloys 2024 Organizing Committee	5:30 p.m.	7:00 p.m.	I	Hilton	Indigo D
Light Metals Division (LMD) Council Meeting	6:00 p.m.	7:30 p.m.	I	Hilton	Indigo H
Biomaterials Committee Meeting	6:00 p.m.	7:00 p.m.	O	Hilton	Indigo B
Chemistry & Physics of Materials Committee Meeting	6:00 p.m.	7:00 p.m.	O	Hilton	Indigo 204B
Shaping & Forming Committee Meeting	6:00 p.m.	7:30 p.m.	O	Hilton	Indigo A
Advanced Characterization, Testing & Simulation Committee Meeting	6:00 p.m.	7:00 p.m.	O	Hilton	Sapphire E
Refractory Metals & Materials Committee Meeting	6:00 p.m.	7:00 p.m.	O	Hilton	Indigo C
Steels Committee Meeting	6:00 p.m.	7:00 p.m.	O	Hilton	Indigo E
Composite Materials Committee Meeting	6:30 p.m.	7:30 p.m.	O	Hilton	Sapphire I
Computational Materials Science & Engineering Committee Meeting	7:30 p.m.	8:30 p.m.	O	Hilton	Sapphire H

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# CALENDAR OF EVENTS

Event/Function Name	Start	End	Access	Venue	Room
<b>Exhibition Events</b>					
Exhibitor Move-in - Monday	8:00 a.m.	10:00 a.m.	R	SDCC	Hall G
Monday TMS2023 Exhibition	11:00 a.m.	6:30 p.m.	O	SDCC	Hall G
Poster Session I Installation	Noon	2:00 p.m.	O	SDCC	Hall G
Poster Session I Gallery Viewing	2:00 p.m.	5:30 p.m.	O	SDCC	Hall G
Exhibit Opening Reception & Poster Session I Presentations	5:30 p.m.	6:30 p.m.	O	SDCC	Hall G
Poster Session I Dismantle	6:30 p.m.	7:00 p.m.	O	SDCC	Hall G
<b>Social and Networking Events</b>					
TMS President Breakfast with Young Leaders Award Recipients	7:30 a.m.	8:30 a.m.	I	Hilton	Sapphire Boardroom
Structural Materials Division / Functional Materials Division (SMD/FMD) Luncheon	Noon	2:00 p.m.	T	SDCC	20D
Past Presidents Meeting & Luncheon	Noon	1:30 p.m.	I	Hilton	Indigo 204B
PubZone Networking Reception	6:00 p.m.	8:00 p.m.	T	Offsite	The Deck at Moonshine Flats
<b>Student and Emerging Professional Events</b>					
Technical Divisions Student Poster Installation	Noon	2:00 p.m.	O	SDCC	Hall G
Technical Divisions Student Poster Showing and Judging	5:00 p.m.	6:30 p.m.	O	SDCC	Hall G
<b>Other</b>					
Light Metals Subject Awards Presentation	1:45 p.m.	2:00 p.m.	O	SDCC	30E
IEA Satellite Meeting on Modeling/Simulations	6:00 p.m.	7:00 p.m.	O	SDCC	26A
<b>Tuesday, March 21, 2023</b>					
<b>All-Conference Events</b>					
Tuesday AIME History Display	7:00 a.m.	5:00 p.m.	O	SDCC	20A Foyer
Tuesday Registration at the Convention Center	7:00 a.m.	5:00 p.m.	O	SDCC	Hall G Pre-Function
Tuesday Registration at the Hilton	7:00 a.m.	5:00 p.m.	O	Hilton	Indigo Lobby Light Wall
Tuesday Member Welcome Center	7:00 a.m.	6:00 p.m.	O	SDCC	Hall F Pre-Function
Tuesday Programming & App Support Desk at the Convention Center	7:00 a.m.	6:00 p.m.	O	SDCC	Hall H Pre-Function
Tuesday Programming & App Support Desk at the Hilton	7:00 a.m.	6:00 p.m.	O	Hilton	Aqua Foyer
Tuesday First Aid	7:00 a.m.	7:00 p.m.	O	SDCC	Hall G
Tuesday Springer Nature Publications Booth	8:00 a.m.	6:00 p.m.	O	SDCC	Box Office G
Tuesday Technical Programming Sessions	8:00 a.m.	6:00 p.m.	O	Both	See Technical Program
Tuesday Morning Break	9:20 a.m.	10:00 a.m.	O	Both	Programming Floors
Lunch - Concessions	11:30 a.m.	2:30 p.m.	O	SDCC	Hall F
Lunch - Food Trucks	Noon	2:30 p.m.	O	Both	Bayfront Park
All Conference Plenary	Noon	1:00 p.m.	O	SDCC	20ABC
Tuesday Afternoon Break	3:50 p.m.	4:30 p.m.	O	Both	Programming Floors
<b>Committee and Council Meetings</b>					
Fellow Award Subcommittee Meeting	7:30 a.m.	8:30 a.m.	R	Hilton	Indigo 204B
Energy Conversion & Storage Committee Meeting	7:30 a.m.	8:30 a.m.	O	Hilton	Indigo C
Education Committee Meeting	7:30 a.m.	9:00 a.m.	I	Hilton	204A
TMS Emerging Professionals Committee (formally Young Professionals Committee)	7:30 a.m.	9:00 a.m.	O	Hilton	Indigo H
Honors & Professional Recognition Committee Meeting	8:30 a.m.	9:30 a.m.	R	Hilton	Indigo 204B

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# CALENDAR OF EVENTS

Event/Fuction Name	Start	End	Access	Venue	Room
Surface Engineering Committee Meeting	8:30 a.m.	9:30 a.m.	O	Hilton	Indigo D
Professional Development Committee Chairs & Director Meeting	9:00 a.m.	10:00 a.m.	I	Hilton	Indigo 204A
Electronic Packaging & Interconnection Materials Committee Meeting	Noon	1:00 p.m.	O	Hilton	Indigo 204B
Public & Governmental Affairs Committee Meeting	1:00 p.m.	3:00 p.m.	O	Hilton	Indigo 204A
Structural Materials Division (SMD) Council Meeting	1:15 p.m.	2:45 p.m.	I	Hilton	Indigo H
Financial Planning Committee Meeting	3:00 p.m.	5:00 p.m.	R	Hilton	Indigo D
Solidification Committee Meeting	5:45 p.m.	6:45 p.m.	O	Hilton	Sapphire I
High Temperature Alloys Committee Meeting	5:45 p.m.	6:45 p.m.	O	Hilton	Indigo B
Materials Processing & Manufacturing Division (MPMD) Council Meeting	6:00 p.m.	7:30 p.m.	I	Hilton	Indigo H
Energy Committee Meeting	6:00 p.m.	7:00 p.m.	O	Hilton	Sapphire E
Nanomaterials Committee Meeting	6:00 p.m.	7:00 p.m.	O	Hilton	Indigo D
Nuclear Materials Committee Meeting	6:00 p.m.	7:30 p.m.	O	Hilton	Sapphire M
Titanium Committee Meeting	6:00 p.m.	7:00 p.m.	O	Hilton	Sapphire L
Corrosion & Environmental Effects Committee Meeting	6:45 p.m.	7:45 p.m.	O	Hilton	Indigo B
Magnetic Materials Committee Meeting	7:00 p.m.	8:00 p.m.	O	Hilton	Indigo C
Exhibition Events					
Tuesday TMS2023 Exhibition	11:00 a.m.	6:30 p.m.	O	SDCC	Hall G
Poster Session II Installation	Noon	2:00 p.m.	O	SDCC	Hall G
Poster Session II Gallery Viewing	2:00 p.m.	5:30 p.m.	O	SDCC	Hall G
Exhibit Hall Happy Hour & Poster Session II Presentations	5:30 p.m.	6:30 p.m.	O	SDCC	Hall G
Poster Session II Dismantle	6:30 p.m.	7:00 p.m.	O	SDCC	Hall G
Social and Networking Events					
Extraction & Processing Division / Materials Processing & Manufacturing Division (EPD/MPMD) Luncheon	1:00 p.m.	3:00 p.m.	T	SDCC	20D
Professor Patrick R. Taylor Honorary Symposium Dinner	6:30 p.m.	9:30 p.m.	T	Check the TMS2023 App for Location	
Student and Emerging Professional Events					
Technical Divisions Student Poster Viewing	11:00 a.m.	6:30 p.m.	O	SDCC	Hall G
Emerging Professionals Tutorial Lecture & Luncheon	1:15 p.m.	2:45 p.m.	T	Hilton	Indigo A
Emerging Professionals Tutorial Lecture	1:15 p.m.	2:45 p.m.	O	Hilton	Indigo A
Student Career Forum	3:00 p.m.	4:30 p.m.	O	Hilton	Indigo A
"Ace the Job Hunt" Workshop	5:00 p.m.	6:30 p.m.	O	Hilton	Indigo A
Technical Divisions Student Poster Dismantle	6:30 p.m.	7:00 p.m.	O	SDCC	Hall G
Other					
Technical Standards in TMS Discussion Group	10:00 a.m.	11:00 a.m.	O	Hilton	Indigo D
Asian/Pacific Islander (API) Workshop and Reception	3:30 p.m.	5:30 p.m.	T	Hilton	Indigo E
Wednesday, March 22, 2023					
All-Conference Events					
Wednesday AIME History Display	7:00 a.m.	5:00 p.m.	O	SDCC	20A Foyer
Wednesday Registration at the Convention Center	7:00 a.m.	5:00 p.m.	O	SDCC	Hall G Pre-Function
Wednesday Registration at the Hilton	7:00 a.m.	5:00 p.m.	O	Hilton	Indigo Lobby Light Wall
Wednesday Member Welcome Center	7:00 a.m.	6:00 p.m.	O	SDCC	Hall F Pre-Function

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Event/Function Name	Start	End	Access	Venue	Room
Wednesday Programming & App Support Desk at the Convention Center	7:00 a.m.	6:00 p.m.	O	SDCC	Hall H Pre-Function
Wednesday Programming & App Support Desk at the Hilton	7:00 a.m.	6:00 p.m.	O	Hilton	Aqua Foyer
Wednesday First Aid	7:00 a.m.	7:30 p.m.	O	SDCC	Hall G
Wednesday Springer Nature Publications Booth	8:00 a.m.	6:00 p.m.	O	SDCC	Box Office G
Wednesday Technical Programming Sessions	8:30 a.m.	5:30 p.m.	O	Both	See Technical Program
Wednesday Morning Break	9:50 a.m.	10:30 a.m.	O	Both	Programming Floors
Lunch - Concessions	11:30 a.m.	2:30 p.m.	O	SDCC	Hall F
Lunch - Food Trucks	11:30 a.m.	2:00 p.m.	O	Both	Bayfront Park
Wednesday Afternoon Break	3:20 p.m.	4:00 p.m.	O	Both	Programming Floors
<b>Committee and Council Meetings</b>					
Functional Materials Division (FMD) Council Meeting	Noon	1:30 p.m.	I	Hilton	Indigo H
International Affairs Committee Meeting	Noon	2:00 p.m.	I	Hilton	Sapphire Boardroom
<b>Exhibition Events</b>					
Wednesday TMS2023 Exhibition	10:00 a.m.	2:00 p.m.	O	SDCC	Hall G
Exhibitor Move-out	2:00 p.m.	7:00 p.m.	R	SDCC	Hall G
<b>Social and Networking Events</b>					
Fresh Coffee, Fresh Ideas: Diversity and Inclusion Breakfast	7:00 a.m.	8:30 a.m.	T	Hilton	Indigo E
Light Metals Division (LMD) Luncheon	Noon	2:00 p.m.	T	SDCC	20D
TMS-AIME Awards Celebration Reception	5:30 p.m.	6:00 p.m.	T	SDCC	Center Terrace
TMS-AIME Awards Ceremony	6:00 p.m.	7:30 p.m.	O	SDCC	20A
<b>Thursday, March 23, 2023</b>					
<b>All-Conference Events</b>					
Thursday AIME History Display	7:00 a.m.	5:30 p.m.	O	SDCC	20A Foyer
Thursday Registration at the Convention Center	7:00 a.m.	2:00 p.m.	O	SDCC	Hall G Pre-Function
Thursday Member Welcome Center	7:00 a.m.	6:00 p.m.	O	SDCC	Hall F Pre-Function
Thursday Programming & App Support Desk at the Convention Center	7:00 a.m.	6:00 p.m.	O	SDCC	Hall H Pre-Function
Thursday Programming & App Support Desk at the Hilton	7:00 a.m.	6:00 p.m.	O	Hilton	Aqua Foyer
Thursday First Aid	7:00 a.m.	5:30 p.m.	O	SDCC	Hall G
Thursday Springer Nature Publications Booth	8:00 a.m.	2:00 p.m.	O	SDCC	Box Office G
Thursday Technical Programming Sessions	8:30 a.m.	5:30 p.m.	O	Both	See Technical Program
Thursday Morning Break	9:50 a.m.	10:30 a.m.	O	Both	Programming Floors
Lunch - Concessions	11:30 a.m.	2:30 p.m.	O	SDCC	Hall F
Thursday Afternoon Break	3:20 p.m.	4:00 p.m.	O	Both	Programming Floors
<b>Committee and Council Meetings</b>					
Annual Meeting of the Membership & Open Board of Directors' Meeting	8:00 a.m.	8:30 a.m.	O	Hilton	Indigo 204A
<b>Other</b>					
NSUF Annual Users Meeting	8:00 a.m.	5:00 p.m.	O	Hilton	Cobalt 501AB

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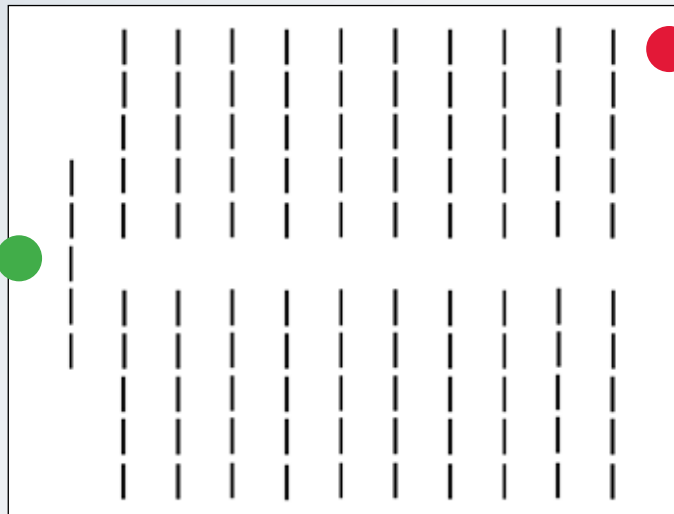
# TECHNICAL COMMITTEE MEETINGS

The following technical committee meetings are open to all TMS members to attend. (If you registered for TMS2023 at the non-member professional rate, your registration includes TMS membership for 2023.) Select the meeting that best matches your interests from the schedule below and plan to attend.


	Committee	Time	Location
Sunday, March 19	Magnesium Committee	1:30 p.m. to 3:00 p.m.	Hilton, Sapphire I
	Recycling & Environmental Technologies Committee	1:30 p.m. to 3:00 p.m.	Hilton, Indigo C
	Aluminum Committee	2:00 p.m. to 4:00 p.m.	Hilton, Indigo E
	Materials Characterization Committee	2:30 p.m. to 4:00 p.m.	Hilton, Indigo 204B
	Pyrometallurgy Committee	3:00 p.m. to 4:30 p.m.	Hilton, Indigo A
	Hydrometallurgy & Electrometallurgy Committee	4:00 p.m. to 5:00 p.m.	Hilton, Indigo C
	Process Technology & Modeling Committee	5:00 p.m. to 6:00 p.m.	Hilton, Indigo A
	Thin Films & Interfaces Committee	5:00 p.m. to 6:00 p.m.	Hilton, Indigo 204B
	Additive Manufacturing Committee	5:30 p.m. to 7:00 p.m.	Hilton, Sapphire E
	Nanomechanical Materials Behavior Committee	6:00 p.m. to 7:30 p.m.	Hilton, Sapphire I
	Alloy Phases Committee	7:30 p.m. to 9:00 p.m.	Hilton, Indigo A
	Mechanical Behavior of Materials Committee	7:30 p.m. to 9:00 p.m.	Hilton, Sapphire I
	Phase Transformations Committee	7:30 p.m. to 9:00 p.m.	Hilton, Indigo E
Monday, March 20	Integrated Computational Materials Engineering Committee	12:15 p.m. to 1:45 p.m.	Hilton, Sapphire L
	Powder Materials Committee	1:15 p.m. to 2:30 p.m.	Hilton, Indigo A
	Advanced Characterization, Testing & Simulation Committee	6:00 p.m. to 7:00 p.m.	Hilton, Sapphire E
	Biomaterials Committee	6:00 p.m. to 7:00 p.m.	Hilton, Indigo B
	Chemistry & Physics of Materials Committee	6:00 p.m. to 7:00 p.m.	Hilton, Indigo 204B
	Refractory Metals & Materials Committee	6:00 p.m. to 7:00 p.m.	Hilton, Indigo C
	Steels Committee	6:00 p.m. to 7:00 p.m.	Hilton, Indigo E
	Shaping & Forming Committee	6:00 p.m. to 7:30 p.m.	Hilton, Indigo A
	Composite Materials Committee	6:30 p.m. to 7:30 p.m.	Hilton, Sapphire I
	Computational Materials Science & Engineering Committee	7:30 p.m. to 8:30 p.m.	Hilton, Sapphire H
Tuesday, March 21	Energy Conversion & Storage Committee	7:30 a.m. to 8:30 a.m.	Hilton, Indigo C
	Surface Engineering Committee	8:30 a.m. to 9:30 a.m.	Hilton, Indigo D
	Electronic Packaging & Interconnection Materials Committee	Noon to 1:00 p.m.	Hilton, Indigo 204B
	High Temperature Alloys Committee	5:45 p.m. to 6:45 p.m.	Hilton, Indigo B
	Solidification Committee	5:45 p.m. to 6:45 p.m.	Hilton, Sapphire I
	Energy Committee	6:00 p.m. to 7:00 p.m.	Hilton, Sapphire E
	Nanomaterials Committee	6:00 p.m. to 7:00 p.m.	Hilton, Indigo D
	Titanium Committee	6:00 p.m. to 7:00 p.m.	Hilton, Sapphire L
	Nuclear Materials Committee	6:00 p.m. to 7:30 p.m.	Hilton, Sapphire M
	Corrosion & Environmental Effects Committee	6:45 p.m. to 7:45 p.m.	Hilton, Indigo B
	Magnetic Materials Committee	7:00 p.m. to 8:00 p.m.	Hilton, Indigo C

# GUIDE TO THE TMS2023 POSTER SESSION

View a changing display of posters in the TMS2023 Exhibit Hall (Hall G) 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.



 : Open Poster Area begins here.

 : On Monday, Posters starting with topic A will begin here. On Tuesday, Posters starting with topic J will begin here.

## How to Navigate the Poster Sessions

Two poster sessions will be held during TMS2023:

- Session I: Monday, 5:30 p.m. to 6:30 p.m.
- Session II: Tuesday, 5:30 p.m. to 6:30 p.m.

Confirmed posters are grouped by topic according to the listing on this page.

- Each topic area is assigned a letter code
- Each poster within that topic is assigned a number
- You can search in the mobile app and mobile-friendly PDF for specific posters and poster numbers.

Posters that were not confirmed will be in the Open Poster Area and are not numbered.

## Poster Session I

Monday, March 20 • 5:30 p.m. to 6:30 p.m.

### FEATURING POSTERS ON:

Additive Technologies (A)
Corrosion (B)
Electronic Materials (C)
Energy & Environment (D)
Light Metals (E)
Mechanics & Structural Reliability (F)
Nanostructured Materials (G)
Physical Metallurgy (H)

## Poster Session II

Tuesday, March 21 • 5:30 p.m. to 6:30 p.m.

### FEATURING POSTERS ON:

Advanced Materials (J)
Biomaterials (K)
Characterization (L)
Materials Design (M)
Materials Processing (N)
Nuclear Materials (O)

## Tips for Poster Presenters:

During their poster session, presenters should:

- Stand by their poster during their designated session time
- Be prepared to discuss their work with attendees viewing the posters



# 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
<b>Additive Technologies</b>												
Additive Manufacturing and Innovative Powder/Wire Processing of Multifunctional Materials	23C				•	•	•		•	•	•	•
Additive Manufacturing Fatigue and Fracture: Effects of Surface Roughness, Residual Stress, and Environment	22		•		•	•	•		•	•	•	•
Additive Manufacturing for Energy Applications V	23A					•	•		•	•	•	•
Additive Manufacturing Keynote Session	20A			•								
Additive Manufacturing of Large-scale Metallic Components	24A				•		•					
Additive Manufacturing of Large-scale Metallic Components	25A								•	•	•	•
Additive Manufacturing of Metals: Applications of Solidification Fundamentals	21		•		•	•	•		•	•	•	•
Additive Manufacturing of Refractory Metallic Materials	24A				•				•	•	•	•
Additive Manufacturing: Beyond the Beam IV	24A		•		•	•						
Additive Manufacturing: Length-Scale Phenomena in Mechanical Response	23B		•		•	•	•		•	•	•	•
Additive Manufacturing: Materials Design and Alloy Development V: Design Fundamentals	24C		•		•	•	•		•	•	•	•
Powder Materials Processing and Fundamental Understanding	25B				•	•	•		•	•	•	•
Quantifying Microstructure Heterogeneity for Qualification of Additively Manufactured Materials	24B								•	•	•	•
<b>Materials Processing</b>												
Advanced Characterization of High-temperature Alloys: Phase Evolution during Manufacturing and Service-induced Deformation	29D		•	•		•	•		•			
Advanced Joining Technologies for Automotive Lightweight Structures	29C		•	•								
Advances in Powder and Ceramic Materials Science	30A		•	•		•	•	•	•	•	•	
Advances in Pyrometallurgy: Developing Low Carbon Pathways	29B		•	•		•	•					
Advances in Surface Engineering V	29D							•		•	•	•
Deformation-Induced Microstructural Evolution during Solid Phase Processing: Experimental and Computational Studies	29C					•	•	•	•	•	•	
Friction Stir Welding and Processing XII	29A		•	•		•	•		•	•	•	•
Frontiers in Solidification: An MPMD Symposium Honoring Jonathan A. Dantzig	28E		•	•		•	•	•	•	•		
High Temperature Electrochemistry V	28B		•	•		•						
Materials Processing Fundamentals	25B			•				•				
Materials Processing Fundamentals	29B								•	•	•	•
Materials Research in Reduced Gravity	30B								•	•	•	•
Rare Metal Extraction and Processing	30B		•	•		•	•	•				
<b>Mechanics &amp; Structural Reliability</b>												
Deformation-Induced Manipulation of Defect Structures and Hierarchical Microstructures	Sapphire P								•	•		
High Temperature Creep Properties of Advanced Structural Materials	Sapphire P		•	•	•	•						

# PROGRAM AT-A-GLANCE

PROGRAM AT-A-GLANCE		MON AM	MON PM	POSTER	TUE AM	TUE PM	POSTER	WED AM	WED PM	THU AM	THU PM
Symposium Name	ROOM										
Nuclear Materials											
Ceramic Materials for Nuclear Energy Research and Applications	28B					•	•	•	•	•	•
Composite Materials for Nuclear Applications II	24B	•	•		•	•					
Materials and Chemistry for Molten Salt Systems	27A	•	•		•	•	•	•	•		
Mechanical Behavior of Nuclear Reactor Materials and Components III	28D	•	•		•	•	•	•	•	•	
Methods, Techniques, and Materials Discovery of Irradiation Effect Using In-situ Microscopy	25A	•	•		•	•					
Microstructural, Mechanical and Chemical Behavior of Solid Nuclear Fuel and Fuel-Cladding Interface	26B	•	•		•	•	•	•			
Phase Stability in Extreme Environments	28C	•	•		•	•		•			
Phase Stability in Extreme Environments	27A									•	
Seaborg Institutes: Emerging Topics in Actinide Materials and Science	28A	•	•		•	•		•	•	•	•
Transmutation Effects in Fusion Reactor Materials: Critical Challenges & Path Forward	27B	•	•		•	•	•	•	•	•	•
Physical Metallurgy											
Computational Thermodynamics and Kinetics	26A	•	•	•	•	•		•	•	•	•
Phase Transformations and Microstructural Evolution	25C	•	•	•	•	•		•	•	•	•
Light Metals											
2023 Light Metals Keynote Session	20A	•									
60 Years of Taking Aluminum Smelting Research and Development from New Zealand to the World: An LMD Symposium in Honor of Barry J. Welch	30E				•	•		•			
Alumina & Bauxite	31B		•					•			
Aluminum Alloys, Characterization and Processing	32A		•	•	•	•		•	•	•	•
Aluminum Industry Emissions Measurement, Reporting & Reduction	31A					•					
Aluminum Reduction Technology	30E								•	•	•
Aluminum Waste Management and Utilization	31A				•						
Cast Shop Technology	31C		•		•	•		•	•		
Electrode Technology for Aluminum Production	31A		•						•		
Light Elements Technology	30D							•	•		
Light Metals Subject Awards Presentation	30E		•								
Magnesium Technology 2023	30C	•	•	•	•	•		•			
Scandium Extraction and Use in Aluminum Alloys	30D		•	•	•	•					

# 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
<b>Characterization</b>												
Advanced Characterization Techniques for Quantifying and Modeling Deformation	Aqua 311A	.	.		.	.	.	.	.	.	.	.
Advanced Real Time Imaging	Aqua 310B		.				.					
Advanced Real Time Imaging	Aqua 310A							.	.	.		
Characterization of Materials through High Resolution Coherent Imaging	Aqua 310A	.	.		.							
Characterization of Minerals, Metals and Materials	Aqua 313	.	.		.	.	.	.	.	.		
Heterostructured and Gradient Materials (HGM V): New Mechanistic Discoveries Enabling Superior Properties	Aqua 314	.	.		.	.	.	.				
Material Behavior Characterization via Multi-Directional Deformation of Sheet Metal	Aqua 309	.	.									
Mechanical Response of Materials Investigated through Novel In-situ Experiments and Modeling	Aqua 310B				.	.	.	.	.	.	.	.
Neutron and X-ray Scattering in Materials Science	Aqua 311B	.	.		.	.	.	.	.			
<b>Nanostructured Materials</b>												
Deformation Mechanisms, Microstructure Evolution, and Mechanical Properties of Nanoscale Materials	Aqua 300AB	.	.	.	.	.		.	.	.	.	.
Functional Nanomaterials 2023	Aqua 305	.	.	.	.	.		.				
Nanostructured Materials in Extreme Environments	Aqua 303	.	.	.	.	.		.	.	.	.	.
<b>Advanced Materials</b>												
2D Materials: Preparation, Properties, Modeling & Applications	Aqua AB	.	.		.	.	.	.	.	.		
Advanced Functional and Structural Thin Films and Coatings & Honorary Palkowski Session	Aqua E	.	.		.	.	.					
Advanced Functional and Structural Thin Films and Coatings & Honorary Palkowski Session	Aqua F									.		
Advances in Multi-Principal Element Alloys II	Aqua D	.	.		.	.	.	.	.	.	.	.
Bulk Metallic Glasses XX	Aqua C	.	.		.	.	.	.	.	.	.	.
High Performance Steels	Aqua F	.	.		.	.	.	.	.			
Refractory Metals 2023	Sapphire P					.	.					
Refractory Metals 2023	Aqua E							.	.	.	.	.
<b>Electronic Materials</b>												
Alloys and Compounds for Thermoelectric and Solar Cell Applications XI	Sapphire A	.	.	.	.	.						
Electronic Packaging and Interconnection	Sapphire D	.	.	.	.							
Electronic Packaging and Interconnection	Sapphire E							.	.			
Phase Stability, Phase Transformations, and Reactive Phase Formation in Electronic Materials XXII	Sapphire E	.	.	.	.	.						
Printed Electronics and Additive Manufacturing: Functional Materials, Processing Techniques, and Emerging Applications	Sapphire 411B	.	.	.	.	.		.	.			



# PROGRAM AT-A-GLANCE

PROGRAM AT-A-GLANCE		MON AM	MON PM	POSTER	TUE AM	TUE PM	POSTER	WED AM	WED PM	THU AM	THU PM
Symposium Name	ROOM										
Energy & Environment											
Advanced Materials for Energy Conversion and Storage 2023	32B	•	•	•	•	•		•	•	•	•
Advances in Magnetic Materials	33A	•	•	•	•	•		•			
Composite Materials for Sustainable and Eco-Friendly Material Development and Application	31C			•						•	•
Electrical Steels	33B			•					•		
Energy Technologies and CO2 Management	33B	•	•	•	•	•					
Natural Fibers and Its Composites: A Sustainable Solution	33B			•				•			
New Directions in Mineral Processing, Extractive Metallurgy, Recycling and Waste Minimization: An EPD Symposium in Honor of Patrick R. Taylor	33C	•	•	•	•	•		•	•	•	•
Biomaterials											
Advanced Biomaterials for Biomedical Implants	Sapphire 400B					•	•	•	•		
Advances in Biomaterials for 3D Printing of Scaffolds and Tissues	Sapphire 400B				•		•				
Advances in Biomaterials for 3D Printing of Scaffolds and Tissues	Sapphire 410A								•		
Bio-Nano Interfaces and Engineering Applications	Sapphire 400A	•	•								
Biological Materials Science	Sapphire 402	•	•		•	•	•	•	•		
Mechanics and Physiological Adaptation of Hard and Soft Biomaterials and Biological Tissues	Sapphire 400B	•	•								
Materials Design											
Accelerated Discovery and Insertion of Next Generation Structural Materials	Sapphire M							•	•		
Advances in Titanium Technology	Cobalt 500	•	•		•	•	•	•	•	•	•
AI/Data Informatics: Computational Model Development, Validation, and Uncertainty Quantification	Cobalt 520	•	•		•	•	•	•	•	•	•
Algorithm Development in Materials Science and Engineering	Aqua 310A					•	•				
Algorithm Development in Materials Science and Engineering	Cobalt 502B							•	•	•	•
Alloy Behavior and Design Across Length-Scales: An SMD Symposium Honoring Easo George	Cobalt 502B	•	•		•	•					
Alloy Development for Energy Technologies: ICME Gap Analysis	Sapphire I	•	•				•				
Computational Discovery and Design of Materials	Cobalt 502A	•	•		•	•	•	•	•		
Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling	Sapphire H	•	•		•	•	•	•	•		
Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling	Aqua 311B									•	
Hume-Rothery Symposium on First-Principles Materials Design	Cobalt 501C	•	•		•	•		•	•		
Materials Genome, CALPHAD, and a Career over the Span of 20, 50, and 60 Years: An FMD/SMD Symposium in Honor of Zi-Kui Liu	Sapphire L	•	•		•	•	•	•	•		
Simulations/Experiments Integration for Next Generation Hypersonic Materials	Sapphire I						•	•	•		

# 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
Thermodynamics and Kinetics of Alloys	Sapphire M	.	.		.	.	.				
<b>Corrosion</b>											
Environmental Degradation of Additively Manufactured Alloys	Sapphire 400A				.	.		.	.		
Environmental Degradation of Multiple Principal Component Materials	Sapphire 410A	.	.	.	.	.		.			
Environmentally Assisted Cracking: Theory and Practice	Sapphire 410B	.	.		.	.		.	.		
Environmentally Assisted Cracking: Theory and Practice	Aqua 314									.	
Local Ordering in Materials and Its Impacts on Mechanical Behaviors, Radiation Damage, and Corrosion	Sapphire 411A	.	.		.	.		.	.		
<b>Special Topics</b>											
2023 Technical Division Student Poster Contest	Exhibit Hall G			.							
Acta Materialia Symposium	Sapphire D					.					
Beyond Apprenticeship: Navigating the Stages of Academia	23A	.	.								
Bladesmithing 2023	Sapphire I				.	.					
Frontiers of Materials Award Symposium: Functional Composition Control of Surface Mechanics in Soft, Water-swollen Gels	Sapphire D								.		
Frontiers of Materials Award Symposium: Intermetallic Alloys at the Edge of Complexity	28C								.	.	
Frontiers of Materials Award Symposium: Ultra-Wide Bandgap Materials and Heterostructures for Next Generation Power, RF and Quantum Applications	Aqua 309					.					
Late News Posters	Exhibit Hall G			.			.				
Nix Award and Lecture Symposium: Learning from Nature – From Insight to Sustainable Innovation	Sapphire D							.			

# TMS 2023

## TMS-AIME AWARDS CEREMONY

**Wednesday, March 22, 2023**

**6:00 p.m. to 7:30 p.m.**

**San Diego Convention Center • Ballroom 20A**



### CEREMONY HOSTS:

**W. Jud Ready**

Georgia Institute of Technology  
2022 TMS President

**Brad Boyce**

Sandia National Laboratories  
2023 TMS President

**Jennifer Miskimins**

Colorado School of Mines  
AIME President

**Elizabeth Holm**

Carnegie Mellon University  
AIME President-Elect

**Carolyn Hansson**

University of Waterloo  
Acta Materialia Executive  
Secretary

**George T. "Rusty" Gray, III**

Los Alamos National Laboratory  
Acta Materialia Chair & Treasurer

**Brian Thomas**

Colorado School of Mines  
Brimacombe Prize Committee

**Clinique Brundidge**

Naval Surface Warfare Center  
2022 SMD Young Leaders  
Professional Development  
Recipient

**Patrice Turchi**

Retired, Lawrence Livermore  
National Laboratory  
2022 TMS Fellow and 2015 TMS  
President

**Fiona Doyle**

University of California - Berkeley  
2021 TMS Fellow and 1998  
Alexander Scott Distinguished  
Service Award Recipient



### 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.



**Jack Grimm**  
University of Washington



**Haozheng Qu**  
Purdue University

### 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.



**Zhuoran Zeng**  
Australian National 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.

"Hydrogen Desorption Spectra from Excess Vacancy-Type Defects Enhanced by Hydrogen in Tempered Martensitic Steel Showing Quasi-cleavage Fracture," *Metallurgical and Materials Transactions A*, November 2019.



**Tetsuya Hirade**  
Japan Atomic Energy Agency



**Kei Saito and Kenichi Takai**  
Sophia University



### 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.



**Sevket Acar**  
Acar Consulting LLC

### 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.



**John Allison**  
University of Michigan



**Patrice Turchi**  
Retired, Lawrence Livermore National Laboratory

### 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.



**Berk Soykan**  
Drexel University



**Raymond Wymierski**  
University of Tennessee

### 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.



**Ben Britton**

University of British Columbia

### ACTA MATERIALIA HOLLOWAY 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.



**Charles Ward**

Retired, U.S. Air Force Research Laboratory

### 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.



**Raymundo Arróyave**

Texas A&M University

### 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.



**Tresa Pollock**

University of California, Santa Barbara

### THE BRIMACOMBE PRIZE

This prize recognizes outstanding achievements in materials process engineering and is presented in memory of J. Keith Brimacombe, an innovative giant in the field of materials process engineering during the later quarter of the 20th century. The Brimacombe Prize was designed to do more than merely honor; it is intended that this award speak symbolically of the achievements of its recipients while perpetuating the attributes that Brimacombe set as standards for his own character and career.



**S. Lee Semiatin**

Retired, Air Force Research Laboratory

### 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 – “Exceptional Ductility Induced by Intrinsic Grain Boundary Engineering”

**Lin Gao**

University of Virginia



Graduate Second Place – “Reactive Introduction of Oxide Nanoparticles in Additively Manufactured 718 Ni Alloys”

**Benjamin Stegman**

Purdue 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  
**Damien Turret**  
IMDEA Materials Institute



2023 JIM Young Leaders International Scholar  
**Kazuki Imasato**  
National Institute of Advanced Industrial Science and Technology



2022 JIM Young Leaders International Scholar  
**Daixiu Wei**  
Tohoku University, Institute for Materials Research



2021 JIM Young Leaders International Scholar  
**Takayuki Kojima**  
Shinshu University

## 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.



**Alison Dunn**  
University of Illinois Urbana-Champaign



**Ashwin Shahani**  
University of Michigan



**Yuji Zhao**  
Rice University

## 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.



**Danielle Cote**  
Worcester Polytechnic Institute



**Grace Gu**  
University of California, Berkeley

## ELLEN SWALLOW RICHARDS 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.



**Grace Jiinliu Wang**  
The Ohio State University

## FRANK CROSSLEY DIVERSITY AWARD

The award recognizes an individual who has personally 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.



**Jenifer Locke**  
The Ohio State University



### BRIMACOMBE MEDALIST – CLASS OF 2023

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.



**Simona Hunyadi Murph**

U.S. Department of Energy and Savannah River National Laboratory



**Nathan Mara**

University of Minnesota-Twin Cities



**Emmanuelle Marquis**

University of Michigan



**Radhakanta Rana**

Tata Steel



**Izabela Szlufarska**

University of Wisconsin-Madison



**Kinga Unocic**

Oak Ridge National Laboratory



**Jian Wang**

University of Nebraska-Lincoln

### 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 Phases Committee in organizing this symposium held in conjunction with the TMS Annual Meeting.



**Gerbrand Ceder**

University of California, Berkeley

### 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.



**Carl Koch**

North Carolina State University

### BRUCE CHALMERS AWARD

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



**Narendra Dahotre**

The University of North Texas

### MORRIS COHEN AWARD

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



**Oleg N. Senkov**

MRL Materials Resources LLC

### CYRIL STANLEY SMITH AWARD

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



**Kristin Persson**

University of California, Berkeley

### 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.



**Joy Forsmark**

Ford Motor Company

### 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.



**Alan Luo**

The Ohio State University

### 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.



**Lynnette Madsen**

Cornell University/National Science Foundation

### 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.



**Peter Anderson**

The Ohio State University

### 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.



**David Danielson**

Breakthrough Energy Ventures

### 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.



**Eduard Arzt**

Leibniz Institute For New Materials

## TMS FELLOW – CLASS OF 2023

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.



**Irene Beyerlein**  
University of California, Santa Barbara



**Julie Christodoulou**  
Materials & Manufacturing Innovations LLC



**David Furrer**  
Pratt & Whitney



**Alan Luo**  
The Ohio State University



**En "Evan" Ma**  
Xi'an Jiaotong University



**Ramana G. Reddy**  
University of Alabama



**James Warren**  
National Institute of Standards and Technology



**Ji-Cheng "JC" Zhao**  
University of Maryland

## ADDITIONAL 2023 AWARD RECIPIENTS

### EXTRACTION & PROCESSING DIVISION (EPD)

#### EPD DISTINGUISHED LECTURER AWARD

**Corale Brierley**  
Brierley Consultancy LLC

#### EPD DISTINGUISHED SERVICE AWARD

**Mark Schlesinger**  
Missouri University of Science and Technology

#### EPD SCIENCE AWARD

**Cong Wang**  
Northeastern University

#### EPD TECHNOLOGY AWARD

"Potentiostatic Electrodeposition of Ti–Al Alloy with 40% Titanium from the Lewis Acidic 1-Butyl-3-Methylimidazolium Chloride-Aluminum Chloride Ionic Liquid Electrolyte," *TMS 2022 151st Annual Meeting & Exhibition Supplemental Proceedings*.

**Yuxiang Peng**  
Brookhaven National Laboratory,

**Ramana G. Reddy** and **Pravin S. Shinde**  
University of Alabama

#### EPD PYROMETALLURGY BEST PAPER AWARD

"Toward Green Ferroalloys: Replacement of Fossil Reductants in the Pre-reduction Process of Chromite by Bio-Based Alternatives," *REWAS 2022: Developing Tomorrow's Technical Cycles (Volume I)*.

**Bernhard Friedrich** and **Marcus Sommerfeld**  
Institute of RWTH Aachen University

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

"Kinetics and Mechanisms of Carbothermic Reduction of Weathered Ilmenite Using Palm Kernel Shell Biomass," *Journal of Sustainable Metallurgy*, December 2021.

**Mark I. Pownceby** and **Nathan A.S. Webster**  
CSIRO Mineral Resources

**Agung Setiawan**  
National Research and Innovation Agency

**Muhammad Akbar Rhamdhani**  
Swinburne University of Technology

**Sri Harjanto**  
Universitas Indonesia



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

"Multiphase Field Modeling of Dendritic Solidification of Low-Carbon Steel with Peritectic Phase Transition," *Metallurgical and Materials Transactions B*, December 2021.

**Sen Luo, Peng Wang, Weiling Wang, Yiming Yang,**  
and **Miao-Yong Zhu**  
Northeastern University

### **FUNCTIONAL MATERIALS DIVISION (FMD)**

#### **FMD DISTINGUISHED SCIENTIST/ENGINEER AWARD**

**Candan Tamerler**  
University of Kansas

#### **FMD DISTINGUISHED SERVICE AWARD**

**Kalpana Katti**  
North Dakota State University

#### **FMD JOHN BARDEEN AWARD**

**Junqiao Wu**  
University of California, Berkeley

#### **FMD JEM BEST PAPER AWARD**

"Graphene-Assisted Synthesis of Fe<sub>4</sub>N with Enhanced Microwave," *Journal of Electronic Materials*, March 2022.

**Ningzhong Bao, Xianping Fan, Jie Ren, Hui Yang, and Lingjie Zhang**  
Zhejiang University

### **LIGHT METALS DIVISION (LMD)**

#### **LMD TECHNOLOGY AWARD**

**Robert Wagstaff**  
Oculatus Consulting

#### **LMD JOM BEST PAPER AWARD**

"Analysis of the Microstructure Role in the Yield Asymmetry of Extruded Mg-LPSO Alloys Using In Situ Diffraction Experiments," *JOM*, July 2022.

**Gerardo Garces, Judit Medina Caballero,**  
and **Pablo Pérez**  
CENIM-CSIC

**Norbert Schell and Andreas Stark**  
Helmholtz-Zentrum Geesthacht

**Hyun Kyu Lim and Shae K. Kim**  
Korea Institute of Industrial Technology

**Paloma Adeva**  
Spanish National Research Council

### **LMD MAGNESIUM TECHNOLOGY BEST PAPER AWARD - APPLICATION**

"Development of Flame-Retardant Wrought Magnesium Alloys and Application of the Alloys to High-Speed Railway Body," *Magnesium Technology 2022*.

**Yasumasa Chino**

National Institute of Advanced Industrial Science and Technology

**Takao Horiya**

Innovative Structural Materials Association

**Takeshi Ishikawa**

Japan Transport Engineering Company

**Futoshi Kido**

Fuji Light Metal Co. Ltd

**Hisashi Mori**

UACJ Corporation

**Kazunori Shimizu**

Sankyo Tateyama, Inc

**Makoto Taguchi**

Kawasaki Railcar Manufacturing Co., Ltd

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

"First-Principles Investigation of the Early-Stage Precipitations in Mg-Sn and Mg-Zn Alloys," *Magnesium Technology 2022*.

**Du Cheng, Kang Wang, and Bi-Cheng Zhou**

University of Virginia

### **LMD MAGNESIUM TECHNOLOGY AWARD - STUDENT PAPER**

"Active Corrosion Protection Surfaces Based on Layered Double Hydroxides Nanocontainers: A Computational Study," *Magnesium Technology 2022*.

**Christian Feiler, Daniel Höche, Xuejiao Li, Robert H. Meissner, Tim Würger, and Mikhail L. Zheludkevich**  
Institute of Surface Science, Helmholtz-Zentrum Hereon

### **LMD MAGNESIUM TECHNOLOGY AWARD - BEST POSTER**

"Effect of Single-Pass Differential Speed Rolling on the Dynamic Recrystallization, Microstructure, and Mechanical Properties of Mg<sub>5</sub>Zn," *Magnesium Technology 2022*.

**Christopher Hale, Svitlana Fialkova, Jagannathan Sankar, Zhigang Xu, Sergey Yarmolenko, and HongLin Zhang**  
North Carolina Agricultural and Technical State University

### LIGHT METALS AWARD

"Aluminothermic Reduction of Sulfides via Reactive Vacuum Distillation," *Light Metals 2022*.

**Spencer Toll**

Avanti Battery Company

**Antoine Allanore** and **Caspar Stinn**

Massachusetts Institute of Technology

### LIGHT METALS SUBJECT AWARD - ALUMINA/BAUXITE

"Green Alumina: A Technological Roadmap," *Light Metals 2022*.

**Edgar Gasafi** and **Alessio A. Scarsella**

Metso Outotec GmbH

### LIGHT METALS SUBJECT AWARD - ALUMINUM ALLOYS

"Development of Advanced Aluminum Alloy for Structural Castings," *Light Metals 2022*.

**Randy Beals**

Magna Cosma

**Zach Brown**

Magna

**Xiaoping Niu**

Cosma R&D

### LIGHT METALS SUBJECT AWARD - ALUMINUM REDUCTION TECHNOLOGY

"Preparation of Aluminum Master Alloys by Electrolytic Co-deposition in Hall-Héroult Cells," *Light Metals 2022*.

**Xiangwen Wang**

Alcoa Corporation

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

"Optical and Electrochemical Characterization of Carbon Anodes with Varying Porosity and Coke Quality," *Light Metals 2022*.

**Hogne Linga**

Hydro Aluminium AS

**Mahyar Farahani**

Northvolt

**Ann-Mari Svensson**

Norwegian University of Science and Technology

**Gøril Jahrsengene**

SINTEF Industry

### LMD/EPD SUBJECT AWARD - RECYCLING

"Shifting the Burden of Selectivity from Chemical to Physical Separation Process via Selective Sulfidation," *REWAS 2022: Developing Tomorrow's Technical Cycles (Volume I)*.

**Antoine Allanore** and **Caspar Stinn**

Massachusetts Institute of Technology

### LMD/EPD ENERGY BEST PAPER AWARD - PROFESSIONAL

"Quantifying the Relationship Between Microstructure and Performance in Gadolinium-Doped Ceria Infiltrated Ni/YSZ Symmetric Cells," *JOM*, October 2022.

**Soumendra N. Basu**, **Srikanth Gopalan**, **Jillian R.**

**Mulligan**, and **Uday B. Pal**

Boston University

### LMD/EPD ENERGY BEST PAPER AWARD - STUDENT

"Synthesis Methods for Nanoparticle Morphology Control in Clean Energy Applications," *REWAS 2022: Energy Technologies and CO2 Management (Volume II)*.

**Joy Morin**

Boise State University

**Donna Guillen**, **Kiyo Fujimoto**, and **Arin Preston**

Idaho National Laboratory

### MATERIALS PROCESSING & MANUFACTURING DIVISION (MPMD)

### MPMD DISTINGUISHED SCIENTIST/ENGINEER AWARD

**Somnath Ghosh**

Johns Hopkins University

### MPMD DISTINGUISHED SERVICE AWARD

**Kester Clarke**

Colorado School of Mines

### MPMD ICME INDUSTRY IMPLEMENTATION AWARD

**General Motors Global Research & Development**

Andrew Bobel accepting on behalf of General Motors Global Research & Development

## STRUCTURAL MATERIALS DIVISION (SMD)

### SMD DISTINGUISHED SCIENTIST/ENGINEER AWARD

**Javier Llorca**

IMDEA Materials Institute and Polytechnic University of Madrid

### SMD DISTINGUISHED SERVICE AWARD

**Elizabeth Holm**

Carnegie Mellon University

### SMD JOM BEST PAPER AWARD

"Estimation of Realistic Microtexture Region Orientation Distribution Functions Using Eddy Current Data," *JOM*, October 2022.

**Matthew Cherry** and **John Wertz**

Air Force Research Laboratory, Wright-Patterson Air Force Base

**Laura Homa**

University of Dayton Research Institute

## YOUNG LEADERS AWARDS

### EPD YOUNG LEADERS PROFESSIONAL DEVELOPMENT

**Adamantia Lazou**

Norwegian University of Science and Technology

**Will Hannemann**

Aurecon

### FMD YOUNG LEADERS PROFESSIONAL DEVELOPMENT

**Jing Du**

Pennsylvania State University

**Arun Kumar Mannodi Kanakkithodi**

Purdue University

### LMD YOUNG LEADERS PROFESSIONAL DEVELOPMENT

**Mertol Gokelma**

Izmir Institute of Technology

**Scott Sutton**

Mag Specialties Inc.

### MPMD YOUNG LEADERS PROFESSIONAL DEVELOPMENT

**Matthew Daly**

University of Illinois Chicago

**Yufeng Zheng**

University of Nevada-Reno

### SMD YOUNG LEADERS PROFESSIONAL DEVELOPMENT

**Dong "Lilly" Liu**

University of Bristol

**Christopher Zenk**

Friedrich-Alexander-Universität Erlangen-Nürnberg

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

**Matteo Seita**

University of Cambridge

## STUDENT DIVISION SCHOLARSHIP AWARDS

### EPD SCHOLARSHIP

**Madison Pixler**

University of Notre Dame

### FMD GILBERT CHIN SCHOLARSHIP

**Griffin Tong**

University of Wisconsin Madison

### LMD SCHOLARSHIP

**Marley Downes**

Drexel University

### MPMD SCHOLARSHIP

**Anush Singhal**

Georgia Institute of Technology

### SMD SCHOLARSHIP

**Sydney Fields**

University of Nevada, Reno



"Disordered interfaces enable high temperature thermal stability and strength in a nanocrystalline aluminum alloy," **Glenn Balbus**.

"Directional solidification and microstructure length scale predictions in binary alloys," **Bárbara Bellon, A.K. Boukellal, T. Isensee, O.M. Wellborn, K.P. Trumble, M.J.M. Krane, M.S. Titus, D. Tourret, J. Llorca**.

"Temperature-dependent deformation behavior and stacking fault energy of Fe40Mn40Co10Cr10 alloy," **Avanish Kumar Chandan, Snehashish Tripathy, Bhaskar Sen, Mainak Ghosh, Sandip Ghosh Chowdhury**.

"Grain boundary segregation engineering to suppress irradiation induced grain growth and defect accumulation in nanograined tungsten," **W. Streit Cunningham**.

"Spatiotemporal control of myofibroblast activation in acoustically-responsive scaffolds via ultrasound-induced matrix stiffening," **Easton Farrell**.

"Biomechanical strategies to reach a compromise between stiffness and flexibility in specialized femoral cuticle," **Chuchu Li**.

"Tracing plastic deformation path and concurrent grain refinement during additive friction stir deposition," **Mackenzie Perry**.

"Characterization of the nature and morphology of coarse precipitation in various oxide dispersion strengthened steels," **Gabriel Spartacus**.

"Quantitative analysis of sulfur segregation at the oxide/substrate interface in Ni-base single crystal superalloy," **Chihiro Tabata**.



The TMS Foundation is the proud sponsor of many of the awards and programs being highlighted at this evening's event and throughout the week at TMS2023.

The Foundation works to strengthen the profession through education, collaboration, and fostering a diverse workforce.

You can make a difference and be a part of future success stories by making a contribution to the TMS Foundation.



**THANK YOU FOR YOUR GENEROUS SUPPORT.**

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

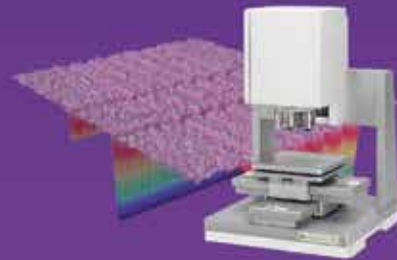
## Tool Applications

### Metals, Materials and Minerals



#### Nanoindenters

Nanomechanical properties mapping, ambient and in situ



#### Optical Profilers

3D topography, surface roughness, stress



#### Thin Film Reflectometers

Film thickness and index measurement and mapping



#### Sheet Resistance Mappers

Metal film thickness and sheet resistance mapping

THE WORLD COMES HERE.

# TMS 2023

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



## 37th EXHIBITION

Located in Hall G of the San Diego  
Convention Center

### EXHIBIT HOURS AND EVENTS:

**Monday, March 20**

Exhibit Hours: 11:00 a.m. to 6:30 p.m.

Exhibit Opening Reception & Poster Session I: 5:30 p.m. to 6:30 p.m.

**Tuesday, March 21**

Exhibit Hours: 11:00 a.m. to 6:30 p.m.

Exhibit Hall Happy Hour & Poster Session II: 5:30 p.m. to 6:30 p.m.

**Wednesday, March 22**

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



# 2023 EXHIBITING COMPANIES DIRECTORY

Current as of February 14, 2023. View the most up-to-date list on the TMS2023 App

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# FLOOR PLAN OF EXHIBITING COMPANIES

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## POSTER SESSION

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# 2023 EXHIBITING COMPANY DESCRIPTIONS

## ABB, Inc.

Booth #305

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.

## Advanced Optical Technologies

Booth #506

## Alemnis AG/Angstrom Scientific Inc.

Booth #308

## Almex USA, Inc.

Booth #409

Almex USA is the leading supplier of aerospace & commercial aluminum billet & slab casting technology & 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 & homogenization systems.

## Boise State University

Booth #211

## Bruker

Booth #513 and #514

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 #209

California Nanotechnologies hosts a complement of advanced powder processing and machining capabilities for your materials research & manufacturing needs. Our state-of-the-art facility features multiple in-house Spark Plasma Sintering systems, cryogenic mills, analytical tools, and tooling fabrication equipment allowing us to be a one stop shop for your R&D programs. Cal Nano serves customers across all industries, universities, and national labs.

## Cameca

Booth #510

## Carl Zeiss Microscopy, LLC

Booth #602

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.

## Ceotherm Industrial Furnaces

Booth #304

Ceotherm produces affordable and quality products compared to its competitors. Aluminum Billet Casthouse, Billet Homogenization Plants, Billet Handling Systems, Tilting Rotary Furnaces, Tilting Type Reverberatory Furnaces, Aluminum Ingot Casting Systems, Hot-Top Billet Casting Systems with related Engineering, Automation, Manufacturing, Installation, and Commissioning.

## CompuTherm, LLC

Booth #611

CompuTherm is a leading developer of CALPHAD-based simulation tools. In addition to thermodynamics & phase equilibrium, Pandat software can be used to simulate materials processing from solidification to homogenization and heat treatment. Thermodynamic, mobility, molar volume and other property databases are available. We also aid customers to develop specialized tools.

## Research in Germany & German Materials Society (DGM)

Booth #214

The German Materials Society (DGM) is a professional organization dedicated to materials science and engineering in Germany. "Research in Germany" is an initiative of the Federal Ministry of Education and Research. It presents Germany as a country of research and innovation and creates a forum for international exchange and cooperation.

## DTE

Booth #217

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 Industry 4.0 and fully autonomous production processes. Further information at booth 217.



# 2023 EXHIBITING COMPANY DESCRIPTIONS

## Eurofins EAG Laboratories

Booth #307

EAG Laboratories, now part of Eurofins global network, is the global leader in materials characterization. We specialize in the determination of material identity, composition, purity, contaminant levels and crystal structure using advanced analytical techniques. We can manage highly complex analytical projects and help you meet your goals quickly and confidently.

## EBSD Analytical

Booth #407

EBSD 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 EBSD Analytical in 2003. With over 23 years of experience, let us show you how materials characterization with EBSD can help improve your processes.

## EDAX

Booth #606

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.

## Elsevier

Booth #406

See our ad on the front inside cover of this conference guide.

## EnPot Ltd

Booth #208

## ETA Inc

Booth #405

## FemtoTools AG

Booth #502

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

## FormAlloy

Booth #613

Headquartered in San Diego, California, 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 #401

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 #507

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.

## Henry Royce Institute for Advanced Materials

Booth #315

The Henry Royce Institute is the UK's national institute for advanced materials research & innovation, established to ensure the UK can exploit its world-leading from discovery to application. Royce ensures that academics & industry in the UK's materials community have access to world-class research capabilities, infrastructure, expertise, & skills development.

## Hycast AS

Booth #306

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.

## Hydrova

Booth #511

## INTEREP Inc

Booth #311

# 2023 EXHIBITING COMPANY DESCRIPTIONS

## JH Technologies

Booth #413

JH Technologies has been successful in supporting manufacturing businesses and research organizations for 30 years. Optical & digital imaging, metallography, sample preparation, and metrology tools backed by expert applications support.

## KLA Corporation

Booth #608

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 #206

## Light Metal Age

Booth #410

*Light Metal Age* magazine has a long legacy in the aluminum industry with 80 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.

## Maschinenfabrik Gustav Eirich GmbH & Co KG

Booth #508

EIRICH is a leading German supplier of industrial material processing solutions. For the carbon sector we offer paste preparation equipment for the production of prebake anodes, Soederberg, graphite electrodes, cathodes, metallurgy and carbon & graphite specialties.

## Micro Materials Ltd

Booth #314

Micro Materials has pioneered many advances in nanomechanical test instrumentation, most recently testing to 1000 degrees C. Our platforms are capable of depth sensing indentation and tribological measurements that can be done over a wide load range. Tribological techniques include scratch and wear, high strain rate nano-impact, micro impact, & nano-fretting.

## MTI Corporation

Booth #609

MTI 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 equipment for High Throughput.

## Nanovea

Booth #213

Nanovea aims to simplify advanced measurement technologies to stimulate material engineering. Ease of use, advanced automation and the dedication to superior accuracy are the driving forces behind its full range of precision instruments. Thousands of clients rely on our accurate & honest solutions, superior instruments and experienced laboratory and consulting services.

## NASA Physical Sciences Informatics (PSI)

Booth #408

## Netzsch Instruments NA LLC

Booth #512

NETZSCH Instruments offers highly sensitive and reliable thermal analysis and rheology 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.

## Nuclear Science User Facilities

Booth #203

The Nuclear Science User Facilities (NSUF) offers unparalleled research opportunities for nuclear energy researchers via 21 partner institutions. Users are granted access via a competitive peer-reviewed process to world-class nuclear research facilities, technical expertise, and assistance with experiment design, assembly, safety analysis and examination.

## Plastometrex Limited

Booth #201

## Precimeter Inc.

Booth #503

Molten Metal level control. Precimeter is a globally active company headquartered in Sweden. We are also located in Germany, USA and China. The core business and focus of Precimeter is molten metal level and flow control.

# 2023 EXHIBITING COMPANY DESCRIPTIONS

## Psylotech Inc

Booth #604

For over 15 years, Psylotech has designed and built 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.

## Quantum Design

Booth #605

Quantum Design, a leading manufacturer of automated material characterization systems, offers the FusionScope™, an innovative correlative microscope that combines the power of AFM with the benefits of SEM imaging to provide completely new insights into the nano-world. QD also distributes additive micro-manufacturing (µm) of metals systems and maskless lithography systems.

## REL, Inc.

Booth #202

REL is an OEM for High Strain Rate Testing equipment and Visible Spectrum LED lights that are designed for dynamic material testing and other events happening on nanosecond timescales! All REL equipment is configured as a turn-key packaged solution for YOUR specific dynamic testing application.

## RUMUL North America LLC

Booth #501

## SamI

Booth #509

## Schrödinger

Booth #505

## Sistem Teknik Industrial Furnaces Ltd.

Booth #414

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.

## STAS

Booth #402

STAS is a world leader in the supply of various equipment and solutions to improve the productivity and quality of aluminium. We have specialized in the development, fabrication and commercialisation of process equipment since 1989. 160 employees and a dozen strategic partners and agents are located in key markets. We provide innovative, robust machines globally.

## Synton MDP AG

Booth #610

Synton-MDP is a manufacturer of diamond stylus for microtechnical instruments. Most of the tips are used in metrological equipment (surface finish, profile, form, nano-indentation, hardness, scratch and other characteristics). We specialise in small spherical tips, with a high level of dimensional accuracy in ultra-compact configurations, and points with razor sharp edges.

## TA Instruments

Booth #607

## Tekna

Booth #205

Tekna has been designing and manufacturing RF-ICP plasma technology for over 30 years. This technology can be used for powder metallurgy and additive manufacturing, nano particle synthesis for energy storage and micro electronics, or even material testing in high enthalpy environments such as space re-entry simulations or hypersonic flight applications.

## Tenova Inc.

Booth #310

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 #412

## Tesla, Inc.

Booth #309



# 2023 EXHIBITING COMPANY DESCRIPTIONS

## Thermo Calc Software Inc.

Booth #301

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 #416

## Total Materia AG

Booth #316

## UES Inc.

Booth #204

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.

## University of North Texas: Center for Agile and Adaptive Additive Manufacturing

Booth #415

## Virtual Lab. Inc.

Booth #313

Materials Square (MatSQ) is a cloud-based materials/chemistry simulation SaaS platform. The state-of-the-art simulation methodologies including DFT, MD, CALPHAD are provided with user-friendly graphical user interface. MatSQ has very reasonable pricing model (PAY-AS-YOU-GO), where you only pay for what you use the cloud.

## Wagstaff, Inc.

Booth #302

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.

# 2023 CONFERENCE SPONSORS

Current as of February 14, 2023  
View the most up-to-date list on the TMS2023 Mobile App

## LANYARDS AND CONFERENCE GUIDE:



## MOBILE APP AND WEB PLATFORM:



Seeing beyond

## DIVERSITY AND INCLUSION BREAKFAST:



ELSEVIER

## ADDITIVE MANUFACTURING KEYNOTE:



## WELCOME RECEPTION, STRUCTURAL MATERIALS DIVISION:



## FRIEND OF TMS:



## NOTES

## MEETING INFORMATION

This image shows a full page of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.





# TMS UPCOMING MEETINGS

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

## SUPERALLOY 718 and Derivatives

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



May 21–25, 2023  
Orlando, Florida, USA  
[www.tms.org/ICME2023](http://www.tms.org/ICME2023)

## TMS FALL 2023 @ MATERIALS SCIENCE & TECHNOLOGY

October 1–4, 2023  
Columbus, Ohio, USA  
[www.tms.org/TMSFall2023](http://www.tms.org/TMSFall2023)



November 12–15, 2023  
Pittsburgh, Pennsylvania, USA  
[www.tms.org/HEA2023](http://www.tms.org/HEA2023)

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

March 3–7, 2024  
Orlando, Florida, USA  
[www.tms.org/TMS2024](http://www.tms.org/TMS2024)

## SUPERALLOYS 2024



September 8–12, 2024  
Champion, Pennsylvania, USA  
[www.tms.org/Superalloys2024](http://www.tms.org/Superalloys2024)

## TMS 2025 154<sup>th</sup> Annual Meeting & Exhibition

March 23–27, 2025  
Las Vegas, Nevada, USA  
[www.tms.org/TMS2025](http://www.tms.org/TMS2025)



November 16–20, 2025  
Phoenix, Arizona, USA  
[www.extractionmeeting.org/2025](http://www.extractionmeeting.org/2025)



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

**SAVE  
THE  
DATE**

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

**MARCH 3–7, 2024**

**HYATT REGENCY ORLANDO | ORLANDO, FLORIDA, USA**  
**#TMSAnnualMeeting | [www.tms.org/TMS2024](http://www.tms.org/TMS2024)**



**JOIN US NEXT YEAR FOR TMS2024**

Next year we'll come together at a new meeting venue: the Hyatt Regency Orlando in Orlando, Florida.

This location will host all conference programming and activities in 2024, so plan to stay at the headquarters hotel for easy access to events throughout the week. With five on-site restaurants and a number of amenities, everything you need will be at your fingertips.

**MARK YOUR CALENDAR WITH THESE KEY DATES**

**May 2023:** Call for Abstracts Opens

**October 2023:** Registration Opens

**March 3–7, 2024:** Conference Dates

**SEE YOU IN ORLANDO!**



1 <b>H</b> 1.00794 Hydrogen	99.9999% aluminum oxide																organometallics																borophene																2 <b>He</b> 4.002602 Helium						
3 <b>Li</b> 6.941 Lithium	4 <b>Be</b> 9.012182 Beryllium	surface functionalized nanoparticles																nanodispersions																3D graphene foam																5 <b>B</b> 10.811 Boron	6 <b>C</b> 12.0107 Carbon	7 <b>N</b> 14.0067 Nitrogen	8 <b>O</b> 15.9994 Oxygen	9 <b>F</b> 18.9984032 Fluorine	10 <b>Ne</b> 20.1797 Neon
11 <b>Na</b> 22.98976928 Sodium	12 <b>Mg</b> 24.305 Magnesium																																	13 <b>Al</b> 26.9815386 Aluminum	14 <b>Si</b> 28.0855 Silicon	15 <b>P</b> 30.973762 Phosphorus	16 <b>S</b> 32.065 Sulfur	17 <b>Cl</b> 35.453 Chlorine	18 <b>Ar</b> 39.948 Argon																
19 <b>K</b> 39.0983 Potassium	20 <b>Ca</b> 40.078 Calcium	21 <b>Sc</b> 44.955912 Scandium	22 <b>Ti</b> 47.867 Titanium	23 <b>V</b> 50.9415 Vanadium	24 <b>Cr</b> 51.9961 Chromium	25 <b>Mn</b> 54.938045 Manganese	26 <b>Fe</b> 55.845 Iron	27 <b>Co</b> 58.933195 Cobalt	28 <b>Ni</b> 58.6934 Nickel	29 <b>Cu</b> 63.546 Copper	30 <b>Zn</b> 65.38 Zinc	31 <b>Ga</b> 69.723 Gallium	32 <b>Ge</b> 72.64 Germanium	33 <b>As</b> 74.9216 Arsenic	34 <b>Se</b> 78.96 Selenium	35 <b>Br</b> 79.904 Bromine	36 <b>Kr</b> 83.798 Krypton																																						
37 <b>Rb</b> 85.4678 Rubidium	38 <b>Sr</b> 87.62 Strontium	39 <b>Y</b> 88.90585 Yttrium	40 <b>Zr</b> 91.224 Zirconium	41 <b>Nb</b> 92.90638 Niobium	42 <b>Mo</b> 95.96 Molybdenum	43 <b>Tc</b> (98.0) Technetium	44 <b>Ru</b> 101.07 Ruthenium	45 <b>Rh</b> 102.9055 Rhodium	46 <b>Pd</b> 106.42 Palladium	47 <b>Ag</b> 107.8682 Silver	48 <b>Cd</b> 112.411 Cadmium	49 <b>In</b> 114.818 Indium	50 <b>Sn</b> 118.710 Tin	51 <b>Sb</b> 121.76 Antimony	52 <b>Te</b> 127.6 Tellurium	53 <b>I</b> 126.90447 Iodine	54 <b>Xe</b> 131.293 Xenon																																						
55 <b>Cs</b> 132.9054 Cesium	56 <b>Ba</b> 137.327 Barium	57 <b>La</b> 138.90547 Lanthanum	72 <b>Hf</b> 178.48 Hafnium	73 <b>Ta</b> 180.9488 Tantalum	74 <b>W</b> 183.84 Tungsten	75 <b>Re</b> 186.207 Rhenium	76 <b>Os</b> 190.23 Osmium	77 <b>Ir</b> 192.217 Iridium	78 <b>Pt</b> 195.084 Platinum	79 <b>Au</b> 196.966569 Gold	80 <b>Hg</b> 200.59 Mercury	81 <b>Tl</b> 204.3833 Thallium	82 <b>Pb</b> 207.2 Lead	83 <b>Bi</b> 208.9804 Bismuth	84 <b>Po</b> (209) Polonium	85 <b>At</b> (210) Astatine	86 <b>Rn</b> (222) Radon																																						
87 <b>Fr</b> (223) Francium	88 <b>Ra</b> (226) Radium	89 <b>Ac</b> (227) Actinium	104 <b>Rf</b> (267) Rutherfordium	105 <b>Db</b> (268) Dubnium	106 <b>Sg</b> (271) Seaborgium	107 <b>Bh</b> (272) Bohrium	108 <b>Hs</b> (270) Hassium	109 <b>Mt</b> (276) Meitnerium	110 <b>Ds</b> (281) Darmstadtium	111 <b>Rg</b> (280) Roentgenium	112 <b>Cn</b> (285) Copernicium	113 <b>Nh</b> (284) Nihonium	114 <b>Fl</b> (289) Flerovium	115 <b>Mc</b> (288) Moscovium	116 <b>Lv</b> (293) Livermorium	117 <b>Ts</b> (294) Tennessine	118 <b>Og</b> (294) Oganesson																																						

58 Ce 140.116 Cerium	59 Pr 140.90765 Praseodymium	60 Nd 144.242 Neodymium	61 Pm (145) Promethium	62 Sm 150.36 Samarium	63 Eu 151.964 Europium	64 Gd 157.25 Gadolinium	65 Tb 158.92535 Terbium	66 Dy 162.5 Dysprosium	67 Ho 164.93032 Holmium	68 Er 167.259 Erbium	69 Tm 168.93421 Thulium	70 Yb 173.054 Ytterbium	71 Lu 174.9668 Lutetium
90 Th 232.0375 Thorium	91 Pa 231.0368 Protactinium	92 U 238.02891 Uranium	93 Np (237) Neptunium	94 Pu (244) Plutonium	95 Am (243) Americium	96 Cm (247) Curium	97 Bk (247) Berkelium	98 Cf (251) Californium	99 Es (252) Einsteinium	100 Fm (257) Fermium	101 Md (258) Mendelevium	102 No (259) Nobelium	103 Lr (262) Lawrencium

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