

A NEW TMS ANNUAL EVENT: Introducing the TMS Specialty Congress

Megan Enright

TMS SPECIALTY CONGRESS 2024



Tim Rupert

Directors, introducing a new TMS annual meeting, the TMS Specialty Congress.

“When I think about the benefits of the new TMS Specialty Congress idea, I realize that some of these individual meetings have their own value and bring new ideas to the table, so I see the excitement of the individual participating units,” said Tim Rupert, Program Chair on the TMS Board of

The TMS Specialty Congress series will convene the Society’s recurring specialty meetings under one roof with a single registration fee that includes all programming and access to multidisciplinary networking opportunities. “What’s really exciting is that by co-locating them, you start to see where there’s some overlap between these areas and where you can learn things from a related, but slightly different, topical area,” said Rupert.



The inaugural TMS Specialty Congress will be held June 16–20, 2024, at the Cleveland Hilton in Cleveland, Ohio, USA. This installment will feature the following three co-located events: The 2nd World Congress on Artificial Intelligence in Materials and Manufacturing (AIM 2024), the Symposium on Digital and Robotic Forming 2024, and Accelerating Discovery for Mechanical Behavior of Materials 2024.

"From an innovative perspective, this type of organization allows some of these medium-sized meetings to be connected and co-located with other groups that are working on innovative new topics that have some relationship, and they can find the synergies and collaborations in this interaction. From a more practical perspective, it allows for economies of scale and for us to really make sure that the event experience is tuned-in and really great," he continued.

The TMS Specialty Congress—like the other two TMS annual events, the TMS Annual Meeting & Exhibition and the TMS Fall Meeting at Materials Science & Technology (MS&T)—will be "built on deep technical content that comes from our members" and "bottom-up science, research, and engineering," Rupert noted.

Read on to hear more about each of these co-located meetings, including comments from the lead organizer of each event.

MEET THE STEERING COMMITTEE

The following individuals are involved in the organizing of the TMS Specialty Congress 2024. These TMS members are experts in their fields and have leveraged their expertise to stringently prepare this event. The Steering Committee includes:



- **Glenn Daehn**, The Ohio State University
- **Frank Delrio**, Sandia National Laboratories
- **Adam Kopper**, Mercury Marine
- **Aerial D.M. Leonard**, The Ohio State University

- **John Lewandowski**, Case Western Reserve University
- **Robert Maass**, Federal Institute of Materials Research and Testing (BAM)
- **Tim Rupert**, University of California
- **Taylor Sparks**, University of Utah

SUBMIT AN ABSTRACT FOR TMS SPECIALTY CONGRESS 2024

"Who should be attending and participating in the TMS Specialty Congress? I really see it as people who are at the forefront of our field, are pushing in new directions, and are studying very innovative new topics," Rupert said. This new event series will provide opportunities for related communities to find synergies with other areas.

"I hope our members benefit from the best of both worlds—the intimate setting of a specialty conference where they can meet members and really focus on a particular topic with the added benefit of additional content being delivered simultaneously so they can learn more about other fields," said 2023 TMS President Brad Boyce.

The call for abstracts for the TMS Specialty Congress is now open. Share your work to be considered for part of this robust technical program. Abstracts must be submitted by October 30, 2023. Learn more about the specific technical topics and submit your abstract at www.tms.org/SpecialtyCongress/2024



THE 2ND WORLD CONGRESS ON ARTIFICIAL INTELLIGENCE IN MATERIALS AND MANUFACTURING (AIM 2024)



Adam Kopper

Following on the success of the first iteration of this meeting held in 2022, "AIM 2024 is focused on integrating artificial intelligence (AI) into materials science research and manufacturing processes," said Rupert. This congress will address key issues and identify future pathways in artificial intelligence implementation in materials science and engineering and related manufacturing processes.

Adam Kopper, technical advisor at Mercury Marine, is the lead organizer for AIM 2024. He became involved in machine learning (ML) after realizing how much data casting processes generate and how the metalcasting industry was not tapping into potential process knowledge. Kopper engages with the greater metalcasting industry through TMS and other industry associations. He said he wanted to be part of the organizing of AIM 2024 because "the top researchers in the world bring their ideas to TMS conferences: applying, improving, and creating leading edge algorithms for materials challenges."

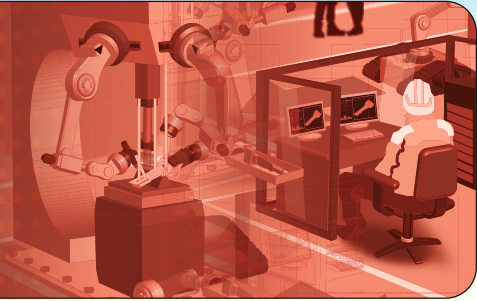
Kopper has several goals and intended takeaways for attendees of AIM 2024. "The field of AI and ML is evolving so quickly . . . I am interested in image processing, so I hope to learn something specifically in that vein. I always have a goal of making new connections with people passionate about what they are doing. . . . I know attendees will see something they were not even looking for and say, 'We can do that! My company, or my research, can benefit from that.'" Specifically, as a TMS member working in industry, Kopper hopes to "offer insights into how manufacturing operations work, what our challenges are, and where researchers could help manufacturers be successful implementing machine learning into their operations."

In addition, Kopper is excited to have AIM 2024 co-located with the other meetings at TMS Specialty Congress 2024. "Attendees interested in more than one of the co-located conferences can save on travel expenses and miss less time in the manufacturing plant, laboratory, or office by taking the one trip. There is [also] great value by co-locating . . . regardless of the focus of the other co-located conferences," he said. "This is because AI and ML can be applied to any data. Many of the tools utilized for materials data analytics were originally developed for a completely different problem. All research generates data; thus, any researcher can benefit from a knowledge of AI."

THE AIM 2024 ORGANIZING COMMITTEE

- **Adam Kopper**, Mercury Marine (Lead Organizer)
- **Remi Dingreville**, Sandia National Laboratories
- **Thilo Muth**, BAM Federal Institute for Materials Research and Testing
- **Elsa Olivetti**, Massachusetts Institute of Technology
- **Adrian Sabau**, Oak Ridge National Laboratory
- **Taylor Sparks**, University of Utah

Symposium on **DIGITAL & ROBOTIC FORMING 2024**



THE SYMPOSIUM ON DIGITAL AND ROBOTIC FORMING 2024



Glenn Daehn

TMS meeting will explore this emerging area.

"I hope attendees see how the forging industry, that has not seen too many fundamental changes in the last 50 years, is poised for transformation, with advanced sensors, design methods, and machine learning," said Glenn Daehn, the Mars G. Fontana Professor of Metallurgical Engineering at The Ohio State University and the director of the U.S. National Science Foundation (NSF) HAMMER Engineering Research Center.

"The Symposium on Digital and Robotic Forming 2024 is really focused on numerically controlled methods; things like robotics and how they can be applied to forming techniques, processing science, and the way we manufacture and make materials," Rupert said. This brand new

Daehn became involved in the areas of digital and robotic forming through the establishment of the HAMMER (Hybrid Autonomous Manufacturing – Moving from Evolution to Revolution) Center. His team came to realize that this emerging area involves a much larger group of stakeholders than just their team. "Deformation processing is the way we make both the largest tonnage of metals and make our highest-performance components. Adding robotics allows us to make this agile," he said. "This Specialty Congress mechanism allows us to bring together the diverse skillsets to make this real—control, robotics, metal forming, standards, applications, and more."

Daehn said he envisions many great crossovers in terms of informal interactions, talks, and keynotes of mutual interest. "This is an area of particular need in the United States," he said. "Our supply chain for large metal parts, such as in aircraft and tooling, is challenged. This [congress] brings together stakeholders with new technology to address these issues."

THE SYMPOSIUM ON DIGITAL AND ROBOTIC FORMING 2024 ORGANIZING COMMITTEE

- **Glenn Daehn**, The Ohio State University (Lead Organizer)
- **Jian Cao**, Northwestern University
- **Kester Clarke**, Colorado School of Mines
- **Babak Raeisnea**, Machina Labs
- **Iain Todd**, University of Sheffield
- **Sarah Wolff**, The Ohio State University

ACCELERATING DISCOVERY FOR MECHANICAL BEHAVIOR OF MATERIALS 2024



ACCELERATING DISCOVERY FOR MECHANICAL BEHAVIOR OF MATERIALS 2024



Aerial D.M.
Leonard

Accelerating Discovery for Mechanical Behavior of Materials 2024 will tie “together what’s happening inside the material and how that affects the mechanical performance of a wide range of material classes,”

Rupert stated. Another brand new TMS meeting, this conference will

encompass cutting-edge research and development efforts surrounding mechanical behavior over a wide range of material types, with an emphasis on the underlying microstructural causes.

Aerial D.M. Leonard, assistant professor at The Ohio State University, became involved in this area in high school. As a serious science fair competitor, she did a project that included linking grain size to tensile behavior in aluminum alloys. Leonard is passionate about this area because it is necessary for designing and developing materials with superior performance and challenges the community to think beyond conventional methods. “I think an exciting area is understanding mechanical behavior in microstructurally and compositionally complex alloys. Mainly because the mechanisms are multi-scale and require techniques from TEM all the way to high energy diffraction microscopy as well as computational tools,” she said.

“I think our meeting will highlight the different techniques and methodologies that research groups are developing to understand these complex mechanisms,” she said. “I think it is a unique platform that will promote deep discussions and collaborations across industry, government, and academia.” Leonard’s main goal with this meeting is to “help attendees build collaborations with others that have similar interests. I hope the meeting will inspire people to think about future material-based challenges such as sustainability.”

According to Leonard, the greatest value of co-locating this meeting with the TMS Specialty Congress 2024 is that “it will attract attendees from various organizations, institutions, and national laboratories. I think this is important for early career scientists who are trying to build relationships and connections outside of their local network . . . We have the opportunity to invite speakers that are doing very unique things to advance the field. I think it is important that we facilitate deeper discussions that are harder to do at the annual meeting.”

THE ACCELERATING DISCOVERY FOR MECHANICAL BEHAVIOR OF MATERIALS 2024 ORGANIZING COMMITTEE

- **Aerial D.M. Leonard**, The Ohio State University (Lead Organizer)
- **Brad Boyce**, Sandia National Laboratories
- **Frank Delrio**, Sandia National Laboratories
- **Daniel Gianola**, University of California, Santa Barbara
- **John Lewandowski**, Case Western Reserve University
- **Erica Lilleodden**, Fraunhofer Institute for Microstructure of Materials and Systems
- **Pania Newell**, University of Utah
- **Corinne Packard**, Colorado School of Mines