ASME IMECE® 2025
International Mechanical Engineering Congress & Exposition®

Program

CONFERENCE
November 16–20, 2025

EXHIBITION
November 17–19, 2025

Renasant Convention Center
Memphis, TN

event.asme.org/IMECE

The American Society of Mechanical Engineers®
ASME®

ASME
SETTING THE STANDARD

WELCOME FROM THE CONFERENCE ORGANIZING COMMITTEE

Dear Colleagues,

It is a true pleasure to welcome you to ASME's International Mechanical Engineering Congress & Exposition (IMECE) 2025, here in Memphis, Tennessee. Each year, IMECE brings together engineers, researchers, government, and innovators from across the globe, and this year's theme—"Engineering a Resilient Future: Innovation, Collaboration, and Global Impact"—reminds us of the role we play in shaping not only our profession, but also the world around us.

Mechanical engineering has always been about problem-solving, but in today's world, resilience is at the heart of our work. From energy and manufacturing to transportation, healthcare, and beyond, we are challenged to design systems that adapt, endure, and make a lasting difference. IMECE provides us with a space to explore these challenges together and to highlight the solutions that emerge when diverse perspectives meet.

The program this year reflects that spirit. Keynote speakers will share their insights on the global forces shaping our profession, while plenary sessions will bring us together to consider how engineering can drive resilience at scale. A wide range of panel discussions will allow us to engage across disciplines, challenge assumptions, and generate ideas that can be carried back to our universities, companies, and communities. These sessions, paired with the technical program, poster presentations, and workshops, ensure there is something here for every participant.

What makes IMECE truly special, however, is not just the exchange of knowledge, but the sense of community. Some of the most valuable moments happen outside the lecture halls—in conversations over coffee, in the exhibit hall, or during networking receptions. These connections often grow into collaborations, partnerships, and friendships that last well beyond the conference itself.

We extend a particular welcome to students and early-career engineers. Your curiosity, energy, and fresh ideas are vital to the future of our field. IMECE offers you a chance to meet mentors, explore career pathways, and share your perspective with an audience eager to listen. For many, this conference becomes a milestone in their professional journey, and we hope it will be for you as well.

On behalf of ASME, thank you for joining us at IMECE 2025. Your presence gives life to this gathering, and together we will continue to push the boundaries of what engineering can achieve. We look forward to the keynotes, panels, plenary discussions—and just as much, the conversations and collaborations—that will make this year's IMECE memorable and impactful for us all.

Warm regards,
2025 IMECE Organizing Committee

Akin Keskin
Conference Chair
Rolls Royce

Arun Muley
Conference Co-Chair
Boeing Research & Technology

Wenbin Yu
Technical Program Chair
Purdue University

Yousof Azizi
Technical Program Vice Chair
Bridgestone Americas

Linxia Gu
Member at Large
Florida Institute of Technology

Chandra Sekhar Rakurty
Member at Large
The M. K. Morse Company

Caterina Rizzi
Member at Large
Università degli Studi di Bergamo

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General Information

ASME SWAPCARD APP

Download the ASME Conference App and hold the entire program in the palm of your hand! The ASME Conferences App allows you to easily look up sessions, search for abstracts or people, message with other attendees, and create your own schedule. An email with the login instructions was emailed to you. Be sure to download the app for the latest information.

SPEAKERS

SPEAKERS' PRACTICE ROOM

Room 205 on the 2nd floor of the Convention Center is the Authors'/Speakers' Practice Room. The schedule is Monday–Thursday, November 16–November 20, 7:00AM–5:00PM. The room is equipped with two (2) LCD projectors, (2) laptop computers, and two (2) screens for authors/speakers to practice their presentations.

AUDIOVISUAL EQUIPMENT IN SESSION ROOMS

All technical sessions are equipped with one LCD projector, one laptop, one screen, and a slide advance. You may bring your presentation on a USB flash drive and load it onto the laptop in the session room.

BADGES ARE REQUIRED FOR ADMISSION TO ALL ACTIVITIES

All conference attendees must wear their official IMECE 2025 conference badge in order to gain admission to conference sessions/events/activities. No one will be admitted to any session unless they are registered and wearing a badge that shows the corresponding product (Full Day, Single Day if the session is on that day, Poster Session, etc.).

SCANNING

All attendees are required to have their badge scanned before lunch functions. If your badge does not include lunch on a certain day, you will not be able to take part.

CHILDCARE SERVICES

We are pleased to once again offer childcare reimbursement for attendees of IMECE 2025. For those who need childcare services, ASME will reimburse up $250 for services incurred by a licensed service provider in Memphis, TN. **This offering will be available November 16–20, 2025 between the hours of 8:00AM and 5:00PM.**

To be reimbursed, you must complete the ASME Volunteer Travel Expense Contribution form (found on the IMECE conference website under the "Venue/Travel" section). All requests for reimbursements must be received by ASME, with itemized receipts, no later than November 30, 2025.

If you have questions related to this benefit, please contact Krishna Hernandez at HernandezK@asme.org.

NOTE: *ASME suggests you may wish to consult with your local hotel concierge for licensed service provider suggestions.*

COAT CHECK

There is a complimentary coat and bag check available on the 2nd floor at the Convention Center. Below is the date and time it will be available:

Thursday, November 20 **7:30AM–6:00PM**

CONTINENTAL BREAKFAST

Continental breakfast will be served on Monday, November 17 through Thursday, November 20 in the Ballroom A/B in the Convention Center. Fully paid attendees are entitled to attend. The schedule is as follows:

Monday, November 17	**7:30AM–8:00AM**
Tuesday, November 18	**7:30AM–8:00AM**
Wednesday, November 19	**7:30AM–8:00AM**
Thursday, November 20	**7:30AM–8:30AM**

EMERGENCY INFORMATION

Alert convention center staff to report a medical or security emergency. Describe the exact location of the incident and the nature of the emergency. Whenever an emergency situation is detected and announced, everyone is expected to evacuate the facility and safely assemble to the parking lots outside until the “All Clear” is given.

EXHIBITS INFORMATION

The exhibits are located in East Hall on the 2nd floor of the Convention Center. The expo hall is your social hub! Be sure to visit the exhibitors and check out the poster sessions, sessions on the stage, and lounge. The exhibit hours are as follows:

Monday, November 17	**12:00PM–7:00PM**
Tuesday, November 18	**12:00PM–4:00PM**
Wednesday, November 19	**12:00PM–4:30PM**

LUNCH

Conference lunches will be served Monday–Wednesday, November 17–November 19, in East Hall of the Convention Center. On Thursday, November 20, lunch is served in Ballroom A/B. Fully paid attendees are entitled to attend. The schedule is as follows:

Monday, November 17	**12:15PM–1:15PM**	
Tuesday, November 18	**12:15PM–1:15PM**	
Wednesday, November 19	**12:15PM–1:15PM**	
Thursday, November 20	**12:10PM–1:55PM**	***Ballroom A/B**

MEETING INFORMATION

Meeting information is located in the Convention Center Level 1 across from 115B near Registration. The operating hours are:

Sunday, November 16	**12:00PM–5:00PM**
Monday, November 17	**7:00AM–6:00PM**
Tuesday, November 18	**7:00AM–6:00PM**
Wednesday, November 19	**7:00AM–6:00PM**
Thursday, November 20	**7:00AM–5:30PM**

MEMBERSHIP TO ASME

Registrants who paid the non-member conference registration fees will receive a four-month complimentary ASME Membership. ASME will automatically activate this complimentary membership for qualified attendees. Please allow approximately four weeks after the conclusion of the conference for your membership to become active. Visit www.asme.org/membership for more information about the benefits of ASME Membership.

NURSING/MOTHER'S ROOM

The Convention Center has a "Nursing Mother's Room" located on the Lower Level.

OPENING RECEPTION

Exhibit Hall Grand Opening and Opening Reception
Monday, November 17
5:30PM–7:00PM

East Hall, Convention Center
All registrants are invited to this special event to celebrate the opening of the IMECE exhibits. Come grab a drink and some food, meet this year's group of exhibitors, and learn about their products and services.

PHOTOGRAPHY

ASME has retained the services of a photographer to capture photo images of the events and activities from the conference. The photographer will be taking photos as assigned by the ASME Communications Department. All photographs are the sole property of ASME, and ASME retains all rights in and to said photographs. These photographs may be used for promotional purposes only, including, but not limited to, the ASME website. If you require more information about the use of IMECE photographs, please go to the media desk at Conference Registration.

POSTER PRESENTATIONS

Poster presentations will be held at the following times:

Monday, November 17
5:30PM–7:00PM
East Hall, Convention Center

UNDERGRADUATE RESEARCH AND DESIGN EXPO STUDENT POSTER COMPETITION

Poster Setup	2:00PM–4:00PM
Judging	4:00PM–6:15PM
Expo (General Viewing)	5:30PM–7:00PM
Winners Announced	6:15PM–6:30PM

Tuesday, November 18
1:15PM–2:45PM
East Hall, Convention Center

RISING STARS OF MECHANICAL ENGINEERING

Poster Setup:	9:00AM–10:00AM
General Viewing	1:15PM–2:45PM
Recognition Announcements	2:30PM–2:45PM

Wednesday, November 19
12:15PM–2:15PM
East Hall, Convention Center

GOVERNMENT AGENCY STUDENT POSTER COMPETITION

Poster Setup:	9:00AM–10:00AM
Judging	10:00AM–2:15PM
General Viewing	12:15PM–2:15PM
Awards	By November 27

RESEARCH PODIUM (POSTERS ONLY)

Poster Setup:	9:00AM–10:00AM
Judging:	10:00AM–1:45PM
General Viewing:	12:15PM–2:15PM
Winners Announced:	2.00PM

PRAYER ROOM

Room RF3 on Level 1 (River Front, access down from Level 2) of the Convention Center is exclusively for those who need to pray in between sessions. There will be dividers in the room to create a semi-private space.

PRESENTER ATTENDANCE POLICY

According to ASME's Conference Presenter Policy, if a paper is not presented at the Conference by a fully registered author of the paper, the paper cannot be published in the official archival Proceedings, which are published on The ASME Digital Collection post-conference. Papers not presented at the conference cannot be cited.

PUBLICATIONS: IMECE2025 CONFERENCE PAPERS AND PROCEEDINGS

Technical papers accepted for publication for IMECE2025 will be available through a dedicated Online Papers site available to all fully paid attendees beginning a week before the conference.

- Zip files will be made available on the Online Papers site prior to the conference, so that users may download to their personal computer systems.
- Post-conference, papers presented at the conference will be published as the official Proceedings of the conference on The ASME Digital Collection (asmedigitalcollection.asme.org).

Authors may refer to The Digital Collection for DOI links and citation information for their papers.

All ASME Conference Proceedings are disseminated worldwide and submitted for indexing to SCOPUS, COMPENDEX, the ISI Conference Proceedings Citation Index, Web of Science (Clarivate), and Google Scholar. For further information about ASME Publications, please contact conferencepubs@asme.org.

REFRESHMENT BREAKS

Morning Break, Main Street Lobby & outside of River Front 1

Monday, November 17	10:00AM–10:20AM
Tuesday, November 18	8:45AM–9:05AM
Tuesday, November 18	10:50AM–11:10AM
Wednesday, November 19	10:00AM–10:20AM
Thursday, November 20	10:00AM–10:20AM

Afternoon Break, Exhibit Hall (East Hall) unless otherwise noted

Monday, November 17	3:25PM–3:45PM	
Wednesday, November 19	4:00PM–4:15PM	
Thursday, November 20	3:45PM–4:00PM	*Main Street Lobby & outside of River Front 1

REGISTRATION

Convention Center Main Street Lobby Level 1

Conference registration will be located on Level 1 of the Convention Center, Sunday–Thursday.

The operating hours are:

Sunday, November 16	12:00PM–5:00PM
Monday, November 17	7:00AM–6:00PM
Tuesday, November 18	7:00AM–6:00PM
Wednesday, November 19	7:00AM–6:00PM
Thursday, November 20	7:00AM–5:30PM

SOCIAL MEDIA

Let's be social! We encourage you to use the hashtag #IMECE2025 to tag your social media posts and photos throughout the conference.

TECHNICAL SESSIONS

Only fully registered conference attendees are allowed to attend plenary and technical sessions.

TICKET SALES

Many division and society awards are given at the IMECE. Tickets for these functions may be purchased on-site at the ASME Registration Desk. Please purchase tickets as soon as possible after you register in order to avoid disappointment. In order to ensure accurate guarantees, it is possible that tickets may not be sold or available up to 48 hours prior to the event.

WI-FI

Free Wi-Fi access is provided to IMECE conference attendees throughout the Convention Center. Free Wi-Fi access is also provided in the hotel rooms at the Sheraton Memphis Downtown Hotel.

Technical Tours

TECHNICAL TOURS

Tour buses leave from the front of the convention center on Main Street.

Fedex Hangar Tour

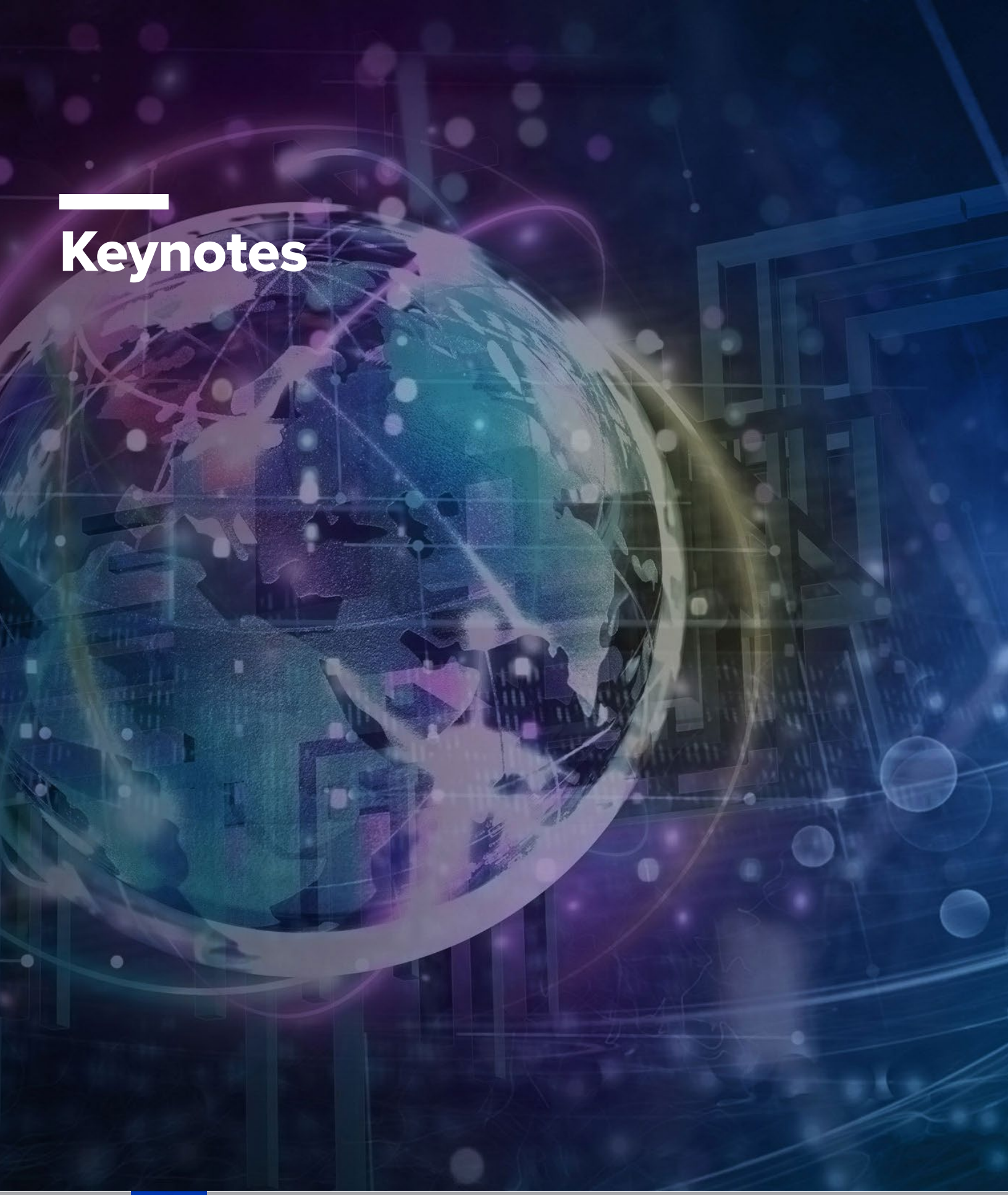
FedEx has grown tremendously since its first night of operations in 1973. Now FedEx serves more than 220 countries and territories and provides customers and businesses worldwide with a broad portfolio of transportation, e-commerce, and business services, offering integrated business solutions utilizing its flexible, efficient, and intelligent global network.

The tour, including travel time, will be approximately two hours. A complimentary shuttle will depart from the convention center at 8:00AM and will arrive at the FedEx facility at 8:30AM. The tour will be held from 8:45 to 10:15AM and is restricted to 30 participants. Guests will be driven back to the Sheraton Hotel and can expect to arrive by approximately 10:50AM.

Special Note: Each attendee needs to wear long pants and closed-toe shoes.

Tour Date: Tuesday, November 18
Capacity: 30
Location: 3050 Winchester Rd., Memphis, TN 38112
Transportation: Shuttle/Bus
Meals: None
Cost: $30

Keynotes



MONDAY, NOVEMBER 17
OPENING KEYNOTE EVENT
8:00AM–9:00AM
(BREAKFAST SERVED FROM 7:30AM TO 8:00AM)
BALLROOM A/B, CONVENTION CENTER

Sponsored by

DEPARTMENT OF MECHANICAL & AEROSPACE ENGINEERING | FAMU-FSU College of Engineering

Keynote Speaker:

Tim Lieuwen
Executive Vice President for Research
Georgia Institute of Technology
2025 ASME Medal Recipient

Keynote Title: Patterns and Structure in the Fury and Noise: Coherent Structures and Organized Dynamics in Modern Power Systems

Abstract: Future propulsion and power systems will be profoundly shaped by societal drivers including decarbonization, national security, and resilience. Addressing these challenges also motivates a rich set of fundamental problems in fluid mechanics and combustion. The internal flows of aircraft engines and power plants, for example, exhibit fascinating and beautiful instabilities—phenomena that are scientifically compelling in their own right. This keynote will span from fundamentals to current applications at the intersection of combustion and fluid mechanics, offering insights for industry, researchers, and students alike.

Biography: Tim Lieuwen is the Executive Vice President for Research (EVPR) at the Georgia Institute of Technology. In this role, he oversees the Institute's $1.37 billion portfolio of research, economic development, and sponsored activities. This includes leadership of the Georgia Tech Research Institute (GTRI), the Enterprise Innovation Institute, nine interdisciplinary research institutes (IRIs), and related research administrative support units. In his 25-plus years at Georgia Tech, Lieuwen earned his master's and Ph.D. degrees in mechanical engineering (1996 and 1999, respectively) and has held multiple leadership positions. He previously served as the executive director of the Strategic Energy Institute (SEI) and interim chair of the Daniel Guggenheim School of Aerospace Engineering.

Lieuwen has received numerous honors and recognition for his work in clean energy systems and policy, national security, and regional economic development. Additionally, he has been awarded the titles of Regents' Professor and the David S. Lewis, Jr. Chair in AE. He is also a member of the National Academy of Engineering and is a fellow of the American Society of Mechanical Engineers and the American Institute of Aeronautics and Astronautics.

TUESDAY, NOVEMBER 18
KEYNOTE LECTURE
11:10AM–12:10PM
BALLROOM A/B, CONVENTION CENTER

Keynote Speaker:

Dr. Calvin Mackie, Ph.D.
Founder and CEO of STEM Nola and STEM Global Action
ASME 2025 Ralph Coats Roe Medal Recipient

Keynote Title: Tinkers of Today Are the Innovators of Tomorrow!

Abstract: Educators acknowledge that when children are allowed to play and tinker, they explore the world around them, figuring out materials and testing the limits of objects and the environment around them. This process develops fine motor skills, and often, the combination of thinking and calculating during tinkering, leads to a vibrant imagination and the building of things from any materials a kid can find. Today, with so much attention on new technology in the home and classroom, advancing motor skills and stimulating the imaginations of our children too often takes a backseat. When tinkering, a child is continuously asking, "Why does this work or why isn't that working?" We must keep our children's minds and hands engaged if we want them to blossom into the next generation's inventors and STEM leaders.

Every child, regardless of their zip code, race, or gender, should have access to high-quality STEM education and career opportunities. STEM NOLA offers a powerful, innovative cadre of community-based and student-centered programming that directly addresses historical challenges and barriers to increase STEM access for all, and especially for underserved and low-resourced youth and communities. This presentation provides an overview of STEM NOLA's core programming, particularly its approach to captivating the hearts and minds of hundreds of youths and organizations across the world.

Biography: Dr. Calvin Mackie is an award-winning mentor, inventor, author, former engineering professor, internationally renowned speaker, and successful entrepreneur. He is the founder and chief executive officer of STEM NOLA, the premiere national STEM (science, technology, engineering, and mathematics) program that designs and delivers activities, programs, and events to K-12 students, families, and communities. Dr. Mackie is a dedicated advocate for STEM education and works tirelessly to inspire the next generation of innovators, creators, and entrepreneurs across America, engage with them and expose them to quality learning experiences that prepare them for exciting career opportunities in STEM-related fields. In 11 years, STEM NOLA has engaged over 200,000 mostly low-income, low-resourced K-12 students in hands-on project-based STEM activities across the country.

Mackie graduated from Morehouse College earning a B.S. in Mathematics in 1990 and was simultaneously awarded a B.S. in Mechanical Engineering from Georgia Tech, where he subsequently earned his Master's and Ph.D. in Mechanical Engineering in 1996. He served on the engineering faculty at Tulane University for twelve years. Mackie has won numerous awards including the 2003 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring in a White House ceremony and currently serves on the Louisiana STEM (LA-STEM) advisory council. Dr. Mackie received the 2019 Congressional Black Caucus Foundation Board's Chair (CBCF) Phoenix Award, the highest honor presented by CBCF. It recognizes individuals whose extraordinary achievements strengthen communities and improve the lives of individuals and families, nationally and globally. Most recently Dr. Mackie was selected as one of 24 recipients of the national Eric and Wendy Schmidt Awards for Excellence in Science Communications. Given by the National Academies of Science, Engineering and Medicine, in partnership with Schmidt Futures, the award recognizes people who have made significant contributions to promoting and advancing science education and communication.

His inspirational memoir, A View from the Roof: Lessons for Life and Business, has been adopted as educational course material by numerous secondary and college teachers throughout the country. His latest book, *Grandma's Hands: Cherished Moments of Faith and Wisdom*, was published in 2012 and received a silver medal in the prestigious Living Now Book Awards. Dr. Mackie is a regular contributor to Forbes.com writing about public engagement in STEM. Dr. Mackie is a devoted husband to his wife, Tracy, and father to his two sons, Myles Ahmad and Mason Amir.

THURSDAY, NOVEMBER 20
KEYNOTE LECTURE & HONORARY MEMBER AWARDS
12:10PM–1:55PM
(LUNCH SERVED FROM 12:10PM TO 12:40PM)
BALLROOM A/B, CONVENTION CENTER

Chandrakant D. Patel
President
Chandrakant Patel Consulting
2025 ASME Honorary Member & ASME President's Award Recipient

Keynote Title: Rise of the Cyber Physical

Abstract: Social, economic, and ecological trends between supply and demand are the drivers of engineering innovations for a resilient future. Trends such as aging population, lack of subject matter experts in critical fields such as healthcare and physical infrastructure, resource constraints, economic disparities, military conflicts, and externalities such as environmental pollution are causing huge supply-demand imbalances. As an example, imbalance caused by lack of subject matter experts in healthcare motivates engineering innovations such as robotic surgery, automation, virtual reality management, and training systems. These cyber-physical systems must be built at scale by systemic integration of physical technologies and cyber technologies. A "full-stack" contributor is one who can put together the physical and cyber stack of technologies and build entire systems. Just working on the IT stack alone—from user to database—does not suffice.

Consider remote robotic surgery systems. These systems start with physical science domain knowledge and right set of actuators and sensors. Given a flexible, configurable, hardware platform, one can layer information (cyber) technologies, including AI. The success of Physical AI enabled solutions necessitate such a comprehensive approach and T-shaped practitioners with depth in physical sciences, breadth in cyber sciences, economics, social sciences, art, and culture.

The 19th century was the machine age, an age of domain fundamentals. The 20th century was the cyber age, an age of human and organization data and cyber sciences. The 21st century cyber physical age, an age of machine generated data and domain fundamentals, is the integration of the two. ASME is uniquely positioned to shape engineering innovations in this age to craft solutions that matter for a resilient future. Please join me in the conversation at IMECE 2025.

Biography: A former Senior VP, Chief Engineer, and Senior Fellow at HP Inc., Chandrakant has been a Silicon Valley contributor for 42 years. Formerly leading HP Labs, he has shaped advancements in data storage, chips, high performance computing systems, storage, networking, 3D additive manufacturing systems, and software platforms. Pioneering energy-efficient data center solutions, he founded the Smart Data Center research program at HP Laboratories that led to multi-billion-dollar data center infrastructure and services business. He is a recognized leader in AI, energy efficient computing, and sustainability.

With deep passion for fundamentals, and workforce development, he has also served as adjunct faculty in engineering at UC Berkeley, San Jose State, Santa Clara University, and Chabot College for two decades. An IEEE Fellow, ASME Fellow, member of the National Academy of Engineering (NAE) and the Silicon Valley Engineering Hall of Fame, Chandrakant holds 167 U.S. patents and has published more than 150 papers. He is a registered professional mechanical engineer in the State of California. Chandrakant has served on the company board of Mphasis, an IT Services Company in India. He has also served on the Industrial Advisory Boards in EECS at UC Berkeley and Mechanical Engineering at Santa Clara University.

HONORARY MEMBERS (TO BE PRESENTED AT THE THURSDAY KEYNOTE)

Timothy S. Fischer, Ph.D.
University of California, Los Angeles

For pioneering efforts at the convergence between heat transfer and nanomaterials, ranging from material processing to thermal characterization and modeling; and for distinguished service to the profession through conference organization and technical committee leadership.

John H. Lienhard V, Ph.D.
Massachusetts Institute of Technology

For sustained contributions to thermodynamic and transport process engineering through modeling, experimentation, design, and patents; for a pioneering, open-access textbook, and for leadership in sustainability research in academia.

Raj M. Manglik, Ph.D. (Deceased)
University of Cincinnati

For innovative contribution to mechanical engineering, including advances in both fundamental and applied industry-related research in energy and thermal-fluid sciences; and for impactful leadership in the professional society in building a diverse and inclusive community.

Kon-Well Wang, Ph.D.
University of Michigan

For lifelong distinguished contribution and leadership that has transformed engineering research and education, established new fields, and elevated the profession.

Plenary Sessions

NOVEMBER 20
9:15AM–10:00AM
ROOM LL9, CONVENTION CENTER

Steven Cummer
Electrical and Computer Engineering
Duke University

Presenting in Track 1: Acoustics, Vibration, & Phononics

Presentation Title: Controlling Sound and Vibration with Acoustic Metamaterials

Abstract: The field of metamaterials emerged from efforts to use engineered structures, rather than intrinsic material properties, to control electromagnetic waves, including light. That concept has since expanded into almost every area touched by wave and transport phenomena. One of the earliest offshoots was the field of acoustic metamaterials, which offers the possibility of manipulating and controlling acoustic and elastic waves in ways that are challenging or impossible with conventional materials. In this presentation, I will describe some early examples of metamaterial designs that yield unusual acoustic properties, beginning with our early work on acoustic cloaking. I will then pivot to some of our more recent work, focusing in particular on merging metamaterial design concepts with acoustofluidics, which exploits the forces produced by ultrasonic fields to control microscale particle motion and fluid flow. Our latest research in this area shows that metamaterial structure can deliver acoustic tweezer functionality that is difficult to achieve by other means.

Biography: Steven A. Cummer is currently the William H. Younger Distinguished Professor of Electrical and Computer Engineering at Duke University. He received his Ph.D. in Electrical Engineering from Stanford University in 1997 and spent two years at NASA Goddard Space Flight Center as a National Research Council postdoctoral research associate before joining Duke. He has written or coauthored more than 300 papers in refereed journals, and he is a Fellow of both the IEEE and the American Geophysical Union. He is a Clarivate Highly Cited Researcher, and he received a Presidential Early Career Award for Scientists and Engineers (PECASE) in 2001. He and his research group led some of the earliest work on acoustic and electromagnetic metamaterials and potential applications, including transformation acoustics and cloaking. His current research interests span a variety of theoretical and experimental topics in engineered materials and metamaterials for controlling acoustic and electromagnetic wave propagation, and also in geophysical remote sensing with a focus on lightning and atmospheric electricity.

NOVEMBER 19
9:15AM–10:00AM
ROOM LL8, CONVENTION CENTER

Alexander F. Vakakis
Donald Biggar Willett Professor of Engineering
Department of Mechanical Science and Engineering
UIUC

Presenting in Track 1: Acoustics, Vibration, & Phononics

Presentation Title: Engineering Energy Transfer and Bandwidth in Vibrations

Abstract: We discuss concepts related to engineering and managing energy transfer and bandwidth in general classes of vibrating systems. To this end, we explore constructive implementation of nonlinearity to induce effects such as targeted energy transfer in preferential paths within a system or in favorable frequency bands and away from unfavorable ones. Important applications in vibration engineering include vibration, shock and blast mitigation, energy harvesting, passive break of classical reciprocity, and bandwidth quantification and tailoring. Focusing on the last topic, in the sciences and engineering the concept of bandwidth is often subject to interpretation depending upon context and the requirements of the specific technical community. Typically, the classical bandwidth of a resonator is determined by the half-power (–3 dB) method, and the result is often referred to as “half-power bandwidth,” with the underlying assumption being that the resonator performance degrades once its power decreases by 50%. However, there are some important restrictions associated with this classical bandwidth definition, e.g., the assumptions of linearity, single-mode response, low-loss, and time invariance. To alleviate these restrictions, we generalize the concept of bandwidth with the aim to make it applicable to a broad class of practical systems, including multi-degree-of-freedom resonators, systems with modal interactions, and nonlinear or time-varying vibrating systems. Based on this, we discuss ways to engineer bandwidth, and discuss important applications such as quantifying the dissipative capacity and rate of dissipation of (even) complex vibrating mechanical systems, monitoring of measured test data, and structural updating.

Biography: Alexander F. Vakakis received his Ph.D. from Caltech (1990 – T.K. Caughey advisor), M.Sc. from Imperial College, London, UK (1985 – D.J. Ewins advisor), and Diploma in Mechanical Engineering from the University of Patras, Greece (1984 – S.A. Paipetis advisor). Currently he is the Donald Biggar Willett Professor of the College of Engineering at the University of Illinois at Urbana – Champaign (UIUC) where co-directs the Linear and Nonlinear Dynamics and Vibrations Laboratory (http://lndvl.mechse.illinois.edu/); moreover, he is co-affiliate faculty at the University of Stuttgart, Germany. Among other awards, he is the recipient of the Tau Beta Pi Daniel C. Drucker Eminent Faculty Award from the UIUC College of Engineering (2023), the best paper award of the journal Nonlinear

Dynamics (2023), an Alexander von Humboldt Research Award (2019), the Edmond J. Safra Visiting Professorship from Technion (2019), and the ASME Thomas K. Caughey Award in nonlinear dynamics (2014). He has published over 370 archival journal publications, holds four patents, and has authored/edited six technical texts and monographs. Many of his Ph.D. students and postdoctoral fellows are currently faculty members in U.S. and International Universities and National Laboratories, or researchers in R&D Centres. His research interests include nonlinear dynamics, vibrations and acoustics, passive energy management and targeted energy transfer across scales, phononics and acoustic metamaterials, system identification and reduced order modelling, non-smooth dynamics and vibration energy harvesting.

NOVEMBER 19
9:15AM–10:00AM
ROOM LL2, CONVENTION CENTER

Paul Witherell
Measurement Science for Additive Manufacturing Program
Engineering Lab
NIST

Presenting in Track 2: Advanced Design and Information Technologies

Presentation Title: Modeling with a Purpose: Developing and Leveraging Digital Twins in a Manufacturing Environment

Abstract: Digital twins are being heralded as a promising means of gaining new insights into physical things through detailed and immersive virtual representations. In a world with increasingly intricate systems and behaviors, and where data has become ubiquitous, digital twins offer new solutions to increasingly complex challenges. Through premises such as these, digital twins continue to gain universal traction. The draw of real time analytics, augmented with high-performance machine learning and insightful AI, has become a powerful motivator for potential digital twin adopters. In practice, however, digital twins often reveal themselves as undeveloped concepts lacking direction and meaning.

Advanced manufacturing offers quintessential environments in which digital twins are expected to excel. With the promise of improved performance and efficiencies with real time monitoring and feedback control, digital twins in manufacturing present themselves as an attractive solution to many of today's manufacturing challenges. For instance, digital twins in additive manufacturing (AM) offer a means for observing and controlling both machines and processes. Process data curated by the digital twin can help establish the provenance of the part being manufactured and in turn inform the design-to-product transformation. Without a grounded perspective, however, realizations often fall short of expectations.

This presentation will explore the premise and characteristics of successful adaptations and implementations of digital twins in design and manufacturing environments. The role of standards as a means to bring digital twins into focus, supporting transparency, integration, and interoperability, will be discussed. The potential value of purpose-driven, domain-specific, and structured digital twins will be assessed in a multi-scale production scenario driven by additive manufacturing. Through robust definitions, formalized representations, explicit context and a strong sense of purpose, digital twins can begin to live up to their vast potential.

Biography: Dr. Paul W. Witherell is a Mechanical Engineer in the Process Engineering (LCE) Group of the Systems Integration Division (SID) of the Engineering Laboratory (EL) at the National Institute of Standards and Technology (NIST). His primary objectives at NIST are to develop and transfer knowledge to industry, including knowledge about information models for additive manufacturing and system level analysis. Research efforts aim to leverage engineering and information sciences to benefit design flexibility, cost, and cycle times in additive manufacturing. His specific job focus is on identifying integration and technology issues that promote industry acceptance of information models, product representation standards, and open architecture that will enable rapid design-to-product transformations. Dr. Witherell's primary areas of interest are Design for Additive Manufacturing, Digital Thread for Additive Manufacturing, Modeling and Simulation for Additive Manufacturing, Design Optimization, Knowledge Representation in Product Development, Ontology and Semantic Relatedness for Design and Manufacturing, and Sustainable Manufacturing.

NOVEMBER 19
9:15AM–10:00AM
ROOM LL9, CONVENTION CENTER

Aaron P. Stebner
Georgia Institute of Technology
Presenting in Track 3: Advanced Manufacturing

Presentation Title: The AI Manufacturing Pilot Facility

Abstract: The 20K ft^2 Advanced Manufacturing Pilot Facility (AMPF) operated by Georgia Tech is being renovated into a 75K+ ft^2 AI Manufacturing Pilot Facility (AIMPF). Manufacturers cannot accept 100% of the risk and cost of maturing AI manufacturing technologies beyond proof-of-concept demonstrations without detriment to existing operations and supply chains. AIMPF will provide a world-leading environment for cooperative industry-academia-government pilot trials and innovation of new technologies, cybersecurity games, and workforce training to innovate, transition, and create AI manufacturing technologies and workforce without risk. AIMPF will operate reconfigurable, digitally integrated, automated test tracks for manufacturing with structural and

energy materials spanning synthesis, semi-finished goods, finished goods, manufacturing quality systems, characterization and metrology, reducing energy footprints and CO_2 emissions, resource management, recycling capabilities, data management, mm-wave wireless communications, and cyber-physical security. AIMPF extends the concept of "self-driving labs" to create a semi-autonomous user facility.

Biography: Prof. Stebner works at the intersection of manufacturing, machine learning, materials, and mechanics. He directs the Georgia Artificial Intelligence Manufacturing (GA-AIM) economic development corridor and is leading the design and implementation of the Georgia Tech AI Manufacturing Pilot Facility. Prof. Stebner joined the Georgia Tech faculty as an Associate Professor of Mechanical Engineering and Materials Science and Engineering in 2020. He also served as the Deputy Editor for the journal, *Additive Manufacturing*. Previously, he was the Rowlinson Associate Professor of Mechanical Engineering and Materials Science at the Colorado School of Mines (2013–2020), a postdoctoral scholar at the Graduate Aerospace Laboratories of the California Institute of Technology (2012–2013), a Lecturer in the Segal Design Institute at Northwestern University (2009–2012), a Research Scientist at Telezygology Inc. establishing manufacturing and "internet of things" technologies for shape memory alloy-secured latching devices (2008–2009), a Research Fellow at the NASA Glenn Research Center developing smart materials technologies for morphing aircraft structures (2006–2008), and a Mechanical Engineer at the Electric Device Corporation in Canfield, OH developing manufacturing and automation technologies for the circuit breaker industry (1995–2000).

He has won numerous awards, including a National Science Foundation (USA) CAREER award (2014), the Colorado School of Mines Researcher of the Year Award (2017), a Long-term Invitational Fellowship for Research from the Japan Society for the Preservation of Science (JSPS, 2019), and the Associate Professor Research Award from the G.W. Woodruff School of Mechanical Engineering at Georgia Tech (2023).

NOVEMBER 20
9:15AM–10:00AM
ROOM LL10, CONVENTION CENTER

Satish Bukkapatnam
Texas A&M University

Presenting in Track 3: Advanced Manufacturing

Presentation Title: AI in Manufacturing: Beyond Prediction and Towards Discovery

Abstract: During the past four decades, various AI and machine learning methods have been adapted for different manufacturing applications. The emergence of large streams of multimodal data has spurred diverse R&D efforts in academia and industry to harness AI/ML to improve decision-making and performance. Central to these efforts are the AI/ML models that can learn the underlying relationships from a variety of data sources to predict, organize, and control the outcomes. Harnessing these AI/ML models for knowledge discovery is evoking a growing interest in various disciplines. This talk presents ongoing efforts in explainable AI ("XAI") for deducing plausible physics that underpin certain data and observations from manufacturing processes. The talk introduces an XAI method that can offer some guarantees on the consistency of the explanations and discusses its application to deduce interesting physical insights from the measured sensor data and image snapshots from a variety of manufacturing processes.

Biography: Satish Bukkapatnam is a Regents Professor and Rockwell International Professor of Industrial & Systems Engineering at Texas A&M University and serves as a program director at NSF's Advanced Manufacturing Program. He received his Ph.D. degree in Industrial and Manufacturing Engineering from Pennsylvania State University. His research interests are broadly in smart and precision manufacturing. Dr. Bukkapatnam is a Fellow of IISE and SME, an Associate member of CIRP, and a Fulbright-Tocqueville Distinguished Chair.

NOVEMBER 18
8:00AM–8:45AM
ROOM LL4, CONVENTION CENTER

Samuel Forest
Centre des Matériaux
Mines Paris PSL University

Presenting in Track 4: Advanced Materials: Design, Processing, Characterization & Applications

Presentation Title: Dynamic Strain Aging Phenomena in Engineering Metallic Alloys: Experiments, Modelling and Impact on Fracture Properties

Abstract: Dynamic strain aging (DSA) phenomena are ubiquitous in engineering metals and alloys and can occur in industrial components under in-service conditions, such as turbine disks in jet and helicopter engines. They result from the interaction of dislocations with diffusing solute atoms or precipitates. They are characterized by serrations on stress-strain curves, formation and propagation of plastic strain rate bands along the specimen, and negative strain rate sensitivity over a range of strain rates and temperatures. Experimental evidence will be provided for several classes of metals, including steels and nickel-base superalloys. Portevin-Le Chatelier (PLC) bands are observed at notches and crack tips and modeled using the Kubin-McCormick approach. Implicit finite element simulations show the effect of strain aging on the bursting of turbine disks with increasing spinning rate. The PLC bands are still observed in metal matrix composites where the particles act as scattering obstacles. 3D tomographic experiments including digital volume correlation show a clear link between PLC bands generated at a crack tip and its ductile propagation. The DSA model is finally combined with the Rousselier model for the simulation of ductile crack propagation in CT specimens of steels and aluminum.

Biography: Samuel Forest is research director at CNRS and professor of continuum mechanics at Mines Paris PSL University. He obtained his Ph.D. in Materials Science and Engineering in 1996. His work aims at introducing the physical aspects of deformation and fracture of materials into the framework of continuum mechanics, especially for aeronautical industrial applications. He has participated in the recent developments of the mechanics of generalized continua including strain gradient plasticity for the simulation of strain localization phenomena. He has published more than 200 articles in international journals in mechanics and physics of materials and structures. He has supervised more than 50 Ph.D. theses, notably within the framework of projects with industrial partners in aeronautics, energy and material processing. From 2009 to 2018, he directed the CNRS Fédération Francilienne de Mécanique, Matériaux, Structures et Procédés, fostering cooperation among the 14 mechanics laboratories in the Paris region. He received the bronze (1998) and silver (2012) medals from the CNRS, the Jean Mandel Prize (2001) and the Huy Duong Bui Prize (2022) of the French Academy of Sciences. He is a Fellow of the Euromech Society for his contributions in computational mechanical metallurgy. He was Associate Editor for *Philosophical Magazine*, *International Journal of Solids and Structures*, and now for the *Journal of the Mechanics and Physics of Solids*. He is the Editor in Chief of the *Comptes Rendus Mécanique*, an open diamond journal of the French Academy of Sciences. He was elected a member of the French Academy of Sciences in 2022.

NOVEMBER 19
9:15AM–10:00AM
ROOM LL4, CONVENTION CENTER

Ravi Mahajan
Intel Corporation

Presenting in Track 4: Advanced Materials: Design, Processing, Characterization & Applications

Presentation Title: Role of Advanced Packaging in Shaping the Semiconductor Industry

Abstract: Heterogeneous Integration (HI) is a powerful and crucial enabler for the continued growth of computing and communication performance. Advanced packaging technologies are critical enablers of HI because of their importance as compact, power efficient platforms. This talk will focus on the tremendous opportunities in different application environments and focus on the projected evolution of advanced packaging architectures. Interest in HI research has picked up in recent years and this opens up greater collaboration opportunities between academia and industry. Specific examples, showing how product implementations take advantage of currently available HI technologies, to provide an unprecedented level of performance, will be used to describe the challenges and opportunities in developing robust, next generation advanced package architectures. A broad scope roadmap of the future generated as part of an indu1stry–academic collaboration will be discussed in this context to highlight the opportunities generated by HI. Opportunities in physical interconnect scaling, materials, thermal management and co-packaged optics, all important elements of the HI Roadmap, will be discussed in detail.

Biography: Ravi Mahajan is an Intel Fellow responsible for Assembly and Packaging Technology Pathfinding. Ravi also represents Intel in academia through research advisory boards, conference leadership, and participation in various student initiatives. He has led Pathfinding efforts to define Package Architectures, Technologies, and Assembly Processes for multiple Intel silicon nodes including 90nm, 65nm, 45nm, 32nm, 22nm, and 7nm silicon. Ravi joined Intel in 1992 after earning his Ph.D. in Mechanical Engineering from Lehigh University. He holds the original patents for silicon bridges that became the foundation for Intel's EMIB

technology. His early insights have led to high-performance, cost-effective cooling solutions for high-end microprocessors and the proliferation of photomechanics techniques for thermomechanical stress model validation.

His contributions during his Intel career have earned him numerous industry honors, including the SRC's 2015 Mahboob Khan Outstanding Industry Liaison Award, the 2016 THERMI Award from SEMITHERM, the 2016 Allan Kraus Thermal Management Medal and the 2018 InterPACK Achievement award from ASME, the 2019 "Outstanding Service and Leadership to the IEEE" Awards from IEEE Phoenix Section & Region 6, the 2020 Richard Chu ITherm Award, and the 2020 ASME EPPD Excellence in Mechanics Award. He is one of the founding editors for the *Intel Assembly and Test Technology Journal* (IATTJ) and currently VP of Publications and Managing Editor-in-Chief of the *IEEE Transactions of the CPMT*. He has long been associated with ASME's InterPACK conference and was Conference Co-Chair of the 2017 Conference. Ravi is a Fellow of two leading societies, ASME and IEEE. He was elected to the National Academy of Engineering in 2022 for contributions to advanced microelectronics packaging architectures and their thermal management.

NOVEMBER 17
9:15AM–10:00AM
ROOM LL7, CONVENTION CENTER

Hyunsun (Alicia) Kim
University of California San Diego

Presenting in Track 6: Advances in Aerospace Technology

Presentation Title: From Shapes to Systems: Rethinking Design with Topology Optimization

Abstract: Despite over three decades of research, topology optimization (TO) continues to provoke a mixed reception in the engineering design community. Lauded as a natural companion to additive manufacturing (AM), it is simultaneously criticized as impractical for real-world engineering design. What remains clear is this: TO is not a push-button tool that produces perfect, ready-to-manufacture designs on demand—nor was it ever meant to be. Yet, in an era of generative AI and conversational design interfaces, where "optimal" solutions are increasingly promised with little more than a prompt, the expectations surrounding automated design tools are shifting. Against this backdrop, TO holds a distinct, and perhaps underappreciated, value: the ability to deliver creative, unintuitive solutions in domains where traditional design intuition fails.

This presentation explores the recent advances of topology optimization—not as a universal tool, but as an essential enabler for complex, multiphysics, and multifunctional systems. In simple, single-function applications, optimized results often align with engineering intuition, reducing the marginal value of TO. However, as modern design problems grow in complexity—requiring interdisciplinary integration and multiphysics/multiscale coupling—human intuition alone is no longer sufficient. Upon reflection of the current research direction in the context of an ever growing class of complex engineering system, the presentation will highlight its capabilities and the substantial challenges that remain.

Biography: H. Alicia Kim is a Professor in the Department of Structural Engineering and Program for Material Science and Engineering at the University of California, San Diego, with affiliate appointments in Mechanical and Aerospace Engineering and Electrical and Computer Engineering. Her M2DO (Multiscale Multiphysics Design Optimization) lab develops topology optimization and computational methods for multiphysics and multifunctional systems, with applications spanning aerospace, energy storage, and additive manufacturing. She also leads the DREAMS center (Dynamically Responsive Emergent Architected Material Systems) working on multiscale nonlinear material design with multiple UC campuses and DOE labs. She has authored over 100 peer-reviewed journal papers and led research projects funded by NASA, DARPA, DOE, and multiple industry partners. Professor Kim has served on editorial boards of several journals, including *Structural and Multidisciplinary Optimization*, and has been actively engaging with the research communities, Past Secretary General of the International Society of Structural and Multidisciplinary Optimization and AIAA MDO TC. She has delivered plenary and keynote lectures at major international conferences and is honored to join the IMECE 2025 program as a plenary speaker.

NOVEMBER 18
8:00AM–8:45AM
ROOM 104, CONVENTION CENTER

Sergio Pellegrino
California Institute of Technology

Presenting in Track 6: Advances in Aerospace Technology

Presentation Title: In-Space Assembly of Large Reflector Antennas

Abstract: Since the beginning of space exploration, large space structures have been built on the Earth, packaged for launch in a rocket, and unfolded in orbit. However, recent advances in autonomous robotic systems and advanced manufacturing have made it feasible to launch sets of modular parts to be assembled by robots, and even to manufacture in space the needed parts. This talk will present a scalable reflector antenna

concept based on the "tension truss" architecture, that is assembled within a self-contained robotic truss builder. Antennas with apertures of hundreds of meters could be built in this way, and would fit within currently existing rockets. A small-scale space demonstration, currently under way, will demonstrate this new approach.

Biography: Sergio Pellegrino is the Joyce and Kent Kresa Professor of Aerospace and Civil Engineering at Caltech, JPL Senior Research Scientist and Co-Director of the Caltech Space Solar Power Project. He is a Fellow of the Royal Academy of Engineering, a Fellow of AIAA and a Chartered Structural Engineer. He has been President of the International Association for Shell and Spatial Structures (IASS) and the founding chair of the AIAA Spacecraft Structures Technical Committee. Pellegrino has received a Pioneers' Award in 2002 from the Space Structures Research Center, University of Surrey, NASA Robert H. Goddard Exceptional Achievement Team Awards in 2009 and 2016, and the IASS Torroja Medal in 2022.

NOVEMBER 20
9:15AM–10:00AM
ROOM LL2, CONVENTION CENTER

Jerald Redmond
Distinguished Engineer
Core Spine R&D, Medtronic Spine

Presenting in Track 7: Biomedical & Biotechnology Engineering

Presentation Title: The Evolution of Enabling Technologies for Spinal Surgery

Abstract: Disorders of the spine can result in a variety of symptoms and complications, impacting a broad spectrum of the population. Approaches for medical intervention vary depending on the severity of the patient's condition and the goals of treatment, including both non-surgical and surgical approaches. In the case of surgery, intervention often involves complex procedures to either eliminate pain or restore alignment. These procedures require highly skilled surgeons capable of planning and executing surgical techniques on a resting spine to achieve a desired post-operative outcome for a weight-bearing spine. With the advancement of computer-based technologies over the past decade, the utilization of enabling technologies by both neurosurgeons and orthopedic surgeons has expanded rapidly, augmenting their highly specialized skills with technologies that further enhance procedural execution and minimize surgical complications. This talk will provide an overview of enabling technologies used in spinal surgery, including how they work, their impact on surgical procedures, and considerations for the next generation of technologies.

Biography: Jerald Redmond is a Distinguished Engineer, Bakken Fellow, and Technical Fellow at Medtronic, with over 25 years of experience in medical device design, including cardiovascular implants, spinal instrumentation, and image-guided surgical systems. He holds adjunct faculty appointments in Biomedical Engineering at Carnegie Mellon University and the University of Memphis and serves as a program evaluator for the ABET Engineering Accreditation Commission. In addition, he is a Fellow of the American Institute of Medical and Biological Engineering (AIMBE) and a Distinguished Fellow of the Bagley College of Engineering at Mississippi State University. He is an inventor on 29 U.S. patents and an author on several peer-reviewed publications. He received his B.S. degree in Biological Engineering from Mississippi State University, and his MS and Ph.D. degrees in Biomedical Engineering from Carnegie Mellon University.

NOVEMBER 19
9:15AM–10:00AM
ROOM LL3, CONVENTION CENTER

Reuben F. Burch V
Texas Christian University

Presenting in Track 7: Biomedical & Biotechnology Engineering

Presentation Title: Building an Interdisciplinary, Human-Driven Research Center

Abstract: Dr. Reuben Burch, Associate Vice President of Research at Texas Christian University, will be sharing the story of how he and his team built the Athlete Engineering Institute. Based on guidance from strength coaches at the collegiate and professional level of sports and founded on human factors principles, Athlete Engineering is now aiding workforce preservation in advanced manufacturing across Mississippi. Attendees of this discussion will learn how the Athlete Engineering Institute supports the predictive and preventative maintenance of the human machine, the industrial athlete.

Biography: Reuben F. Burch V, Ph.D. is the Associate Vice President for Research in the Office of Research and Economic Development at Texas Christian University. He is the Executive Director and founder of the Athlete Engineering Institute which headquarters the statewide workforce training program, AiM UP: Advancements in Manufacturing Upskilling Program. Burch continues to serve as an associate professor in the Industrial & Systems Engineering department, holds the Jack Hatcher Endowed Chair for Engineering Entrepreneurship, and is a civic leader to the U.S. Air Force and Space Force. Since moving to academia, he has been awarded $35M in funding, published over 100 journal articles, and been awarded nearly 50 patents. Prior to his start as a professor in the

Fall of 2016, Dr. Burch spent 14 years working for and with global Fortune 500 companies in research and development areas such as virtual reality design, weapons systems and training, satellite systems and geospatial data, high-value financial software systems, logistics technology and management, autonomous vehicle design, wearables, and human performance.

NOVEMBER 18
8:00AM–8:45AM
ROOM LL3, CONVENTION CENTER

Hanqing Jiang
Westlake University

Presenting in Track 8: Dynamics, Vibration, & Control

Presentation Title: Mechanics and Devices for Mechanical Haptics

Abstract: Unlike visual or auditory stimuli, touch commands immediate attention and elicits instinctive reactions, making it essential for environmental interactions, personal safety, and emotional connections. The sense of touch is fundamental to our perception of the world, providing critical sensory feedback that enhances dexterity, proprioception, and social communication. Recent advancements in bioelectronics have transformed traditional haptic devices into wearable and adaptable systems, unlocking new possibilities for tactile interactions in virtual and physical environments. However, existing wearable haptic interfaces are often constrained by unimodal feedback, continuous energy demands, limited spatial resolution, and challenges in seamless attachment to the body, restricting their potential for real-world applications. This talk will cover recent progress in mechanical haptics developed in my group, focusing on both wearable and structured approaches to enhancing tactile interactions. We will introduce curved origami-based stiffness manipulation, enabling *in situ* stiffness switching across positive, zero, and negative ranges. This approach provides unprecedented control over mechanical compliance, with applications in robotics, prosthetics, and a novel first-person haptic device that synchronizes with virtual environments to replicate realistic material perception. By leveraging the geometric reconfigurability of origami structures, we demonstrate how programmable stiffness can enhance tactile realism and user experience in interactive systems.

Additionally, we will present a wireless, real-time haptic interface that leverages a mechanically bistable mechanism inspired by the Kresling origami pattern. This innovative design enables diverse tactile sensations—including normal pressure, shear force, and vibrations—by storing and releasing mechanical energy through the skin. Unlike conventional actuators that require continuous power input, this bistable mechanism capitalizes on mechanical energy retention to provide energy-efficient and programmable haptic feedback, making it particularly suitable for long-duration wearable applications.

Furthermore, we will discuss a bistable soft-pneumatic textile interface designed for full-body haptics, offering multimodal touch feedback for immersive and assistive applications. By integrating flexible, soft actuators with programmable bistability, this interface achieves spatially distributed and temporally controlled haptic feedback across large surface areas, enabling applications in virtual reality, rehabilitation, and remote communication. Its energy-efficient operation and adaptability to various body regions present a transformative step in wearable haptic technology. These advancements represent a paradigm shift in haptic technology, broadening its applications in human-machine interactions, medical rehabilitation, gaming, and immersive digital experiences. By addressing the limitations of current haptic systems and leveraging interdisciplinary innovations in mechanics, materials, and bioelectronics, our research paves the way for next-generation haptic interfaces that are more versatile, efficient, and seamlessly integrated into everyday life.

Biography: Hanqing Jiang is a Chair Professor of Mechanical Engineering at Westlake University, China. Before joining Westlake in June 2021, he was a faculty member in Mechanical Engineering at Arizona State University from 2006 to 2021. He earned his Ph.D. in Solid Mechanics from Tsinghua University in 2001. His research focuses on origami- and kirigami-based mechanical metamaterials for robotics and human-machine interactions, lithium-metal batteries, and unconventional electronics. He has authored five book chapters and over 150 peer-reviewed journal papers. He was elected an ASME Fellow in 2016, a member of the European Academy of Sciences and Arts in 2024, and a member of the European Academy of Sciences in 2024. He currently serves as Chair of the Executive Committee of the ASME Materials Division and was President of the Society of Engineering Science in 2022. His selected honors include an NSF CAREER Award (2009), the ASME Worcester Reed Warner Medal (2021), and the Yonggang Huang Engineering Science Medal (2025).

NOVEMBER 17
9:15AM–10:00AM
ROOM LL3, CONVENTION CENTER

Dr. B. Balachandran
University of Maryland
Caughey Medal Award Winner

Presenting in Track 8: Dynamics, Vibration, & Control

Presentation Title: Can Random Interventions Enable Order?

Abstract: The constructive role of temporal disorder (random noise) in facilitating desired responses of nonlinear systems will be explored in this talk, through a combination of experimental and numerical investigations. In particular, nonlinear oscillators and nonlinear oscillator arrays will be considered. These oscillator systems represent models of micro-scale and macro-scale systems. It is discussed how random interventions can be used to transition from one dynamic to another, including transition from a chaotic state to a periodic state, influence energy localization, and realize full synchronization.

Biography: Dr. Balachandran received his B. Tech (Naval Architecture) from the Indian Institute of Technology, Madras, India, M.S. (Aerospace Engineering) from Virginia Tech, Blacksburg, VA and Ph.D. (Engineering Mechanics) from Virginia Tech. Currently, he is a Distinguished University Professor and a Minta Martin Professor at the University of Maryland, where he has been since 1993. His research interests include applied physics, applied mechanics, applied mathematics, nonlinear phenomena, dynamics and vibrations, and control. The publications that he has authored/co-authored include a Wiley textbook entitled “Applied Nonlinear Dynamics: Analytical, Computational, and Experimental Methods” (1995, 2004), a Thomson/Cengage textbook (2004, 2009) and a Cambridge University Press textbook (2019) entitled “Vibrations,” and a co-edited Springer book entitled “Delay Differential Equations: Recent Advances and New Directions” (2009). He holds four U.S. patents and one Japan patent, three related to fiber optic sensors and two related to atomic force microscopy. He has served as the Editor of the ASME Journal of Computational and Nonlinear Dynamics, a Contributing Editor of the International Journal of Non-Linear Mechanics, and a Deputy Editor of the AIAA Journal. He is an ASME Fellow, an AIAA Fellow, an Honorary Fellow of the Royal Aeronautical Society, an ASA full member, and an IEEE Senior Member. He is a recipient of the ASME Melville Medal, the Den Hartog Award, & the Lyapunov Award, the ASCE Engineering Mechanics Institute Robert Scanlan Medal, and the AIAA Pendray Aerospace Literature Award.

NOVEMBER 18
8:00AM–8:45AM
ROOM LL7, CONVENTION CENTER

William Mustain
University of South Carolina

Presenting in Track 9: Energy

Presentation Title: Industry Collaborations in the Carolina Institute for Battery Innovation—Fundamental Research to Pilot Scale Manufacturing

Abstract: Over the past few years, there has been a huge amount of global interest in the development and development of batteries for both EV and grid applications. This interest has resulted in unprecedented investment by government agencies around the world, particularly in Li-ion batteries. Many organizations have seen this investment as an opportunity to expand their areas of expertise and have reacted by hiring faculty, staff scientists, etc. The University of South Carolina has a historical strength (four decades) in electrochemical and today boasts a robust team of nearly 100 people working in this area—16 faculty, supported by dozens of postdocs, staff as well as graduate and undergraduate students. USC faculty work in several areas related to Li-based and non-Li batteries, focusing on: i) new materials, chemistries and cell designs (active materials; liquid and solid-state electrolytes, etc.); ii) battery assembly, performance and degradation; iii) commercially-viable systems for at-scale battery recycling; iv) battery safety testing, specifically abuse and mechanical impact; v) modular, compact power electronics; vi) computer simulations from material® microstructure® cell® pack® EV/grid; and vii) future batteries, such as structural and flexible for low weight and wearables. We have used this expertise to collaborate extensively with industrial partners and to help them to better understand and design materials and systems.

This talk will start by focusing on a few key collaborations with industry. These will focus on the creation of new battery materials, understanding key degradation pathways, development of new simulation tools, and battery recycling. The main idea here is not to provide a comprehensive report on each area of study, but to use these as case studies that show capability, expertise and our commitment to providing industry-relevant solutions. After the presentation of the case studies, the presentation will transition to the university-wide commitment to the success of the Carolina Institute for Battery Innovation (CIBI). CIBI was formed in 2024, building off of the extensive strengths in batteries at USC, to advance

battery education, research, and manufacturing through training and innovating on the nanoscale, grid-scale, and everything in between. The first round of funding for CIBI came from the U.S. Economic Development Administration, with additional support from the U.S. Department of Energy, SC Department of Commerce, and SC Nexus. CIBI was approved by the Commission for Higher Education, making it a state-recognized center of excellence in batteries. This talk will discuss the new construction being done on campus to fully house the CIBI. The construction and renovation is happening over two phases and will culminate in over 100,000 square feet of research, teaching, and manufacturing space, all focused on batteries. CIBI will house multiple pilot manufacturing lines that will help to drive innovation forward for industry, defense, and academic partners.

Biography: William Mustain is a Professor in the Department of Chemical Engineering and the Director of the Carolina Institute for Battery Innovation (CIBI) at the University of South Carolina. He works in several areas related to electrochemical energy generation and storage, including high capacity materials for Li-ion batteries, novel electrode structures for Li-S batteries, battery recycling, corrosion and passivation of materials, catalysts and supports for proton exchange membrane and anion exchange membrane fuel cells and electrolyzers, electrochemical reactor design, and electrochemical synthesis of fuels. He has published over 150 peer-reviewed articles (h-index 56) and has over 100 invited lectures. He has served as the chair of the Energy Technology Division of the Electrochemical Society and AIChE Area 1E: Electrochemical Fundamentals. He has been the recipient of several awards including the U.S. Department of Energy Early Career Award, Electrochemical Society Energy Technology Research Award, Connecticut Quality Improvement Platinum Award, Supramaniam Srinivasan Young Investigator Award (Awarded by the Energy Technology Division of the Electrochemical Society), UConn Chemical Engineering Faculty of the Year Award, USC Chemical Engineering Publication Award, USC CEC Research Achievement Award, Illinois Institute of Technology Young Alumnus Award, and Fulbright Scholar Fellowship.

NOVEMBER 20
9:15AM–10:00AM
ROOM LL8, CONVENTION CENTER

S.A. Sherif
University of Florida

Presenting in Track 9: Energy

Presentation Title: Energy Management Strategies in Space-Based Systems

Abstract: Increased interest in space exploration and the drive for permanent human presence in space are placing increasing demands on improvements in both space power generation and space energy management capabilities. Efforts to develop lightweight space power generation capabilities in the megawatt to gigawatt range using a variety of technologies are in great demand. Power generation technologies being considered for space applications require the development or improvement of several subsystems that include solar photovoltaic cells, solar dynamic power modules, wireless transmission of power capabilities, integrated structure and power distribution systems, and space environmental damage control and safety enhancement capabilities, to name a few. These subsystems add to the overall system mass not only because of their inherent component mass, but also because of the increased mass of the energy management system. For many space applications, of which space power generation is but one example, a lighter energy management system is a strong driver in reducing the cost of the mission. In this presentation, we will explore the challenges in space-based energy management systems and examine different strategies for optimum operation.

Biography: Dr. SA Sherif is Professor of Mechanical and Aerospace Engineering at the University of Florida. He is a Life Fellow of ASME, a Life Fellow of ASHRAE, a Fellow of the Royal Aeronautical Society, a Fellow of the American Society of Thermal and Fluids Engineers, and an Associate Fellow of AIAA. He served as Editor-in-Chief of the *ASME Journal of Thermal Science and Engineering Applications* (2014–2019) and as Editor-in-Chief of the *ASME Journal of Solar Energy Engineering* (2020–2028). He also served as Vice President of Commission B-2 on Thermodynamics and Transfer Processes of the International Institute of Refrigeration (2020–2023) and is currently a member of the Board of Directors of the International Association for Hydrogen Energy (IAHE). He is the 2024 recipient of the ASME Frank Kreith Energy Award.

NOVEMBER 17
9:15AM–10:00AM
ROOM LL4, CONVENTION CENTER

Jeffrey A. Roux
University of Mississippi

Presenting in Track 10: Engineering Education

Presentation Title: What Are We Investing In? Laying a Strong Foundation Is a Key to Our Future Success in Engineering Education

Abstract: ASME Life Fellow with five decades of engineering excellence under his belt, Dr. Jeffrey A. Roux, presents a candid blueprint for engineering students and faculty to be ready to tackle challenges of the 21st century and solve them with a holistic approach. While Dr. Roux has built a legacy through developing many successful engineers in various fields, he points out the importance of engineering students taking their four years of engineering education seriously recognizing it is going to affect 50 years of their future in significant contribution to the field and society. He would strongly advise students to enhance their success through a co-op program sandwiched between lower and upper levels of their four-year degree as that five-year investment prepares them fully ready for an excellent engineering career. He would like students to become ASME members early and be exposed to many opportunities the society provides. Dr. Roux would like them to be lifelong learners. He insists that educators must have the passion to teach, interact, and build the students along their academic journey. He stresses the importance of hard work, communication, and interpersonal skillset in addition to the technical depth, and his characteristic advice on persistence to "hang in there." It is a rare treat that ASME Engineering Education track plenary will reminisce the wisdom of a proven statesman in our profession who does not sit on his laurels or legacy but reminds adherence to laying a sure foundation which lends to outstanding results that will benefit many stakeholders. Citing examples from scores of funded projects, Dr. Roux will lay out the blueprint for the characteristics that are critical for our future engagement and success.

Biography: Dr. Jeffrey A. Roux, a New Orleans native, earned his bachelor's degree from Louisiana State University and master's and doctoral degrees from the University of Tennessee. After a decade-long professional career in central Tennessee, he came to the University of Mississippi (Ole Miss) as an associate professor of mechanical engineering in 1980, became full professor in 1985, and served as Chair for 21 years. Dr. Roux built a solid foundation for the mechanical engineering department at Ole Miss and served it with excellence till his retirement in 2020. Among Roux's achievements are the Society of Automotive Engineers' Ralph R. Teetor Educational Award, the ASME Meritorious Service Award for Region IX, and the Burlington Northern Faculty Achievement Award for Teaching and Scholarship. Within the university, Roux has received the Outstanding Mechanical Engineering Department Teacher Award six times and the School of Engineering Outstanding Faculty Member of the Year Award four times. A registered professional engineer in Mississippi since 1987, he is both an ASME Life Fellow and an American Institute of Aeronautics and Astronautics Fellow. Dr. Roux's research interests are in the thermal sciences within mechanical engineering. A prolific author and scholarly researcher, Roux has published 150 papers and peer-reviewed journal articles over his career of five decades. He worked on 28 externally funded research projects. He had advised eight Ph.D. and 40 master's students who are making significant contributions in engineering across the globe. He is remembered as a stellar teacher by the many undergraduate students and the graduate students he has taught. Professor Emeritus Roux and his wife Cindy (who passed away in 2013) have three adult children who earned degrees from Ole Miss and so are his eight grandchildren having graduated or will graduate at some point from the University of Mississippi.

ROOM LL2, CONVENTION CENTER

Rajat Mittal
Professor of Mechanical Engineering
Johns Hopkins University

Presenting in Track 11: Fluids Engineering

Presentation Title: From Vortices to Forces: Physics-Enabled Human Learning in the Age of Data and AI

Abstract: Understanding the origins of unsteady aerodynamic forces is central to problems ranging from the performance of aircraft, drones, rotors, and flow-energy devices to the propulsion of fish, birds, and insects. These forces arise from the combined effects of vorticity, added-mass response, and viscous diffusion, yet disentangling their relative contributions remains a fundamental challenge. In the age of Bigdata and AI, where massive data sets from high-fidelity simulations and experiments are increasingly driving new black-box machine learning methods, there is an increasing need for interpretable and generalizable physics-grounded methods that allow humans to continue to learn from these large datasets rather than be overwhelmed by them.

The Force Partitioning Method (FPM) addresses this need by decomposing pressure forces into vortex-induced, acceleration-induced, and viscous components. Unlike purely data-driven black-box models, FPM leverages first principles to transform complex flow fields into interpretable causal attributions. By applying FPM to diverse vortex-

dominated systems including dynamic stall on foils, vortex-induced vibrations, schooling fish, and rough-wall turbulence, we demonstrate how data can be interpreted into meaningful physical insights. In this way, FPM serves not only as a diagnostic tool but also as a framework for enhancing human learning from large-scale flow data. Extensions of FPM to experimental datasets highlight its utility as a bridge between numerical, laboratory, and field measurements. Overall, FPM exemplifies how data-enabled, interpretable methods can continue to empower fluid dynamicists to extract knowledge, guide design, and accelerate discovery in the era of big data and AI.

Biography: Rajat Mittal is a fluid dynamicist and a professor of mechanical engineering at Johns Hopkins University (JHU). He also holds a secondary appointment in the JHU School of Medicine. Mittal earned his bachelor's degree in Aeronautical Engineering from the Indian Institute of Technology, Kanpur, in 1989. He then pursued a M.S. in Aerospace Engineering from the University of Florida, followed by a Ph.D. in Applied Mechanics from the University of Illinois at Urbana-Champaign in 1995. Mittal's academic journey includes postdoctoral research at the Center for Turbulence Research at Stanford University, where he focused on large-eddy simulation. He began his teaching career at the University of Florida in 1996, and from 2001 to 2009, he was a faculty member at George Washington University. Since 2009, he has been a professor at Johns Hopkins University. Mittal is recognized for his work on immersed boundary methods and their applications in fluid flow problems. He leads the Flow Physics and Computation Lab at JHU, focusing on computational fluid dynamics, vortex dominated flows, biofluid mechanics, bioinspired engineering, and flow control. His research has contributed to fluid-structure interaction, cardiology, biolocomotion, bioacoustics, COVID biophysics, gastric digestion, active flow control, and turbulent flows. Mittal is also the founder and CTO of HeartMetrics, Inc., a startup developing computational tools for diagnosing coronary artery disease. He is the recipient of the 1996 Francois Frenkiel and the 2022 Stanley Corrsin Awards from the Division of Fluid Dynamics of the American Physical Society (APS), and the 2006 Lewis Moody as well as 2021 Freeman Scholar Awards from the American Society of Mechanical Engineers (ASME). He is a Fellow of ASME, APS, and AIMBE, and an Associate Fellow of AIAA. He is an associate editor of several journals including *Journal of Computational Physics and Physics of Fluids*.

NOVEMBER 18
8:00AM–8:45AM
ROOM LL2, CONVENTION CENTER

Sean Bradshaw
Pratt & Whitney

Presenting in Track 11: Fluids Engineering

Presentation Title: Powering the Future

Abstract: Projected demand growth in the aviation sector over the next quarter century is driving the need for greater aircraft fuel efficiency and lower noise footprint. This presentation will provide a brief overview of Pratt & Whitney's approach to powering the future of flight, including geared turbofans, hybrid-electric propulsion, technical evaluations of synthetic aviation fuels, and supporting industry collaborations through ASTM on rigorous standards that would enable the commercial use of 100% synthetic aviation fuels.

Biography: Sean Bradshaw is a senior technical fellow at Pratt & Whitney, where his primary focus is the development of advanced propulsion technologies that will power the future of flight. Pratt & Whitney is a world leader in the design, manufacture, and service of aircraft engines and auxiliary power units. Sean holds memberships in the American Society of Mechanical Engineers, the American Institute of Aeronautics & Astronautics, and the Aeronautics & Space Engineering Board of the National Academies of Sciences, Engineering, and Medicine. Sean earned a B.S., M.S., and Ph.D. in Aeronautics & Astronautics from the Massachusetts Institute of Technology.

NOVEMBER 17
9:15AM–10:00AM
ROOM LL1, CONVENTION CENTER

Michael Webber
University of Texas at Austin

Presenting in Track 12: Heat Transfer & Thermal Engineering

Presentation Title: Global Energy Trends and Transition

Abstract: The worldwide energy sector is going through dramatic shifts in energy demand, end-uses, and sources. Population growth and economic growth are driving up total demand. Industrialization, urbanization, electrification, and motorization are changing how we use energy. And a policy push for domestic, low-carbon and renewable fuels is changing our sources of energy. At the same time, we are entering an era where markets, technologies, and policies are enabling dramatic increases in U.S. production of oil, gas, wind, solar, and bioenergy that is affecting global economies, the environment, and our national security posture. In parallel, our energy and information sectors are merging to form smarter energy systems and more energy-intensive information systems. For this talk, Dr. Webber will give an entertaining and big-picture overview of global energy trends mixed in with humorous anecdotes, historical snippets, and unexpected examples that will give a surprising look into the future of energy.

Biography: Dr. Michael E. Webber is the Sid Richardson Chair in the LBJ School of Public Affairs and the John J. McKetta Centennial Energy Chair in the Department of Mechanical Engineering at the University of Texas at Austin. In addition to his role as a faculty member, from August 2021 to September 2024, Webber served as CTO of Energy Impact Partners, a $5 billion venture fund focused on investments in cleantech and climate tech startups with the potential for deep decarbonization at speed and scale. Furthermore, from September 2018 to August 2021, Webber was based in Paris, France, where he served as the Chief Science and Technology Officer at ENGIE, one of the world's largest energy companies. Webber's works spans research and education at the convergence of engineering, policy, and commercialization on topics related to innovation, energy, and the environment. His group's research tackles complex energy systems analysis with a deep record of expertise on the following: 1) grid reliability in the face of electrification and the rise of variable sources in a warming world; 2) the hydrogen sector and how it couples to other sectors, such as the grid, transportation, industry, and the built environment; and 3) the food-energy-water-waste nexus. He serves on the board of GTI Energy (an industry consortium formerly known as the Gas Technology Institute) and the Scientific Advisory Council for ENGIE.

Webber has authored or co-authored more than 600 publications, including five full-length general interest books, and holds six patents. His essays have been published in *The New York Times*, *The Wall Street Journal*, *Washington Post*, *Scientific American*, and more. Webber's scholarly articles have appeared in top journals such as *Science*, *Nature*, and *Environmental Science & Technology*. His book, *Power Trip: the Story of Energy*, was published in 2019 by Basic Books with an award-winning 12-part companion series spread out over two seasons that aired on PBS, Amazon Prime, AppleTV, and in-flight entertainment on American Airlines. The series had more than 10,000 broadcasts in the United States and has been distributed in dozens of countries, ultimately reaching millions of viewers. Seasons 1 and 2 of Power Trip along with his documentary, Thirst for Power and television special, Energy at the Movies, have been recognized with six Telly Awards (one gold, four silver, and one bronze) for excellence in television.

In 2024, Webber was selected for the Energy Thought Leader: Higher Education award by the American Energy Society and a three-year term as a Fulbright Technical Specialist by the U.S. State Department. He was selected in 2014 as a Fellow of ASME (the American Society of Mechanical Engineers); in 2018 as a member of the 4th class of the Presidential Leadership Scholars, which is a leadership training program organized by Presidents George W. Bush and William J. Clinton; and in 2022 for the Rockefeller Foundation's prestigious writer's residency in Bellagio, Italy. He was honored as an American Fellow of the German Marshall Fund and on four separate occasions by the University of Texas for exceptional teaching. Webber holds a B.S. and B.A. from UT Austin, and a M.S. and Ph.D. in mechanical engineering from Stanford University.

NOVEMBER 18
8:00AM–8:45AM
ROOM LL8, CONVENTION CENTER

Vikram Deshpande
University of Cambridge

Presenting in Track 13: Mechanics of Solids, Structures, & Fluids

Presentation Title: New Measurement Strategies for Data-Driven Mechanics

Abstract: There has been explosive growth in numerical data-driven mechanics approaches for various problems in the mechanics of materials. These data-driven methods are data-hungry, but traditional measurement protocols are inherently data-poor. Consequently, most studies using these data-driven methods have relied on synthetic data. This dearth of measurement techniques presents opportunities to transform laboratory-based methods, making them more suitable for emerging methodologies in data-driven mechanics. We first give a brief overview of some emerging laboratory techniques to provide observations that were hitherto considered nearly impossible, at least in a laboratory setting. These methods include (i) dynamic tomography to enable 3D visualization of high-speed deformations, (ii) digital volume correlation in nominally homogeneous materials, and (ii) democratizing synchrotron technologies to allow the measurements of local stresses within statically indeterminate specimens via energy-dispersive diffraction measurements.

These and other new laboratory measurement methods provide new observations and large datasets. But how can they be used in the data-driven mechanics discovery of constitutive behavior? Broadly, the constitutive model discovery approaches fall into two categories: (i) supervised models that require data in the form of stress-strain pairs and (ii) unsupervised models that require no stress data but only full-field displacement and global force data. The energy dispersive measurements provide fully labelled stress-strain pairs for supervised constitutive model discovery approaches. Using these measurements, we shall demonstrate the learning of the plasticity models for Ti64 from a single tensile test on a simple notched specimen. Remarkably, the model indicates that simple J2 plasticity is not sufficient to accurately model the plastic response of Ti64, while this is, of course, known in the literature, those inferences were obtained using multiple different complex specimens designed with significant a priori knowledge of the material response. These new measurement techniques offer the possibility of quickly learning complex constitutive responses and may lead to the discovery of new physics.
Biography: Vikram Deshpande is a professor of Materials Engineering at the University of Cambridge. He has also served on the faculties at the University of California, Santa Barbara, and at the Technical University of Eindhoven. With his students and collaborators, he has worked primarily in experimental and theoretical solid mechanics and currently serves as the editor-in-chief of the Journal of the Mechanics and Physics of Solids (JMPS). His recognitions include the 2020 Rodney Hill Prize in Solid Mechanics, the 2022 Prager Medal, the 2022 ASME Koiter Medal, the 2024 Bazant Medal ASCE, and the 2025 European Solid Mechanics prize. He has been elected Fellow of the Royal Society, London, the UK Royal Academy of Engineering, and an International Member of the U.S. National Academy of Engineering (NAE).

NOVEMBER 17
9:15AM–10:00AM
ROOM LL8, CONVENTION CENTER

Thao (Vicky) Nguyen
Johns Hopkins University

Presenting in Track 13: Mechanics of Solids, Structures, & Fluids

Presentation Title: Modeling the Unique Viscoelastic Behaviors of Liquid Crystal Elastomers

Abstract: Liquid crystal elastomers (LCEs) exhibit complex thermo-mechanical behaviors that can be harnessed for a wide range of applications in soft robotics, biomedical devices, and energy absorption. The material consists of stiff mesogens bound within an elastomeric network of flexible polymer chains. The mesogens interact energetically and can order and disorder in response to temperature and mechanical deformation, amongst other stimuli. This enables LCEs to undergo reversible phase transitions between the disordered isotropic, ordered monodomain, and polydomain states. The motion of the mesogens relative to the polymer network results in unique behaviors, including reversible actuation response to temperature and soft elasticity.

Additionally, LCEs display enhanced energy dissipation compared to conventional elastomers due to the viscous rotation of the mesogens and the relaxation of the network chains. These viscoelastic dissipation mechanisms can be utilized to design LCE materials and structures with extraordinary toughness, impact energy absorption, and mechanical damping. However, these same properties may hinder the actuation and morphing capabilities of the material. Predictive modeling is essential for efficiently designing and optimizing LCE structures to attain the desired performance. In this presentation, I will outline our recent efforts to develop generalized continuum theories for the thermomechanical behavior of monodomain nematic elastomers that incorporate the rate-dependent deformation mechanisms of the mesogens and the network chains. I will demonstrate the predictive capabilities of the theories and highlight their application to design energy-absorbing architected materials, assess the effectiveness of actuators, and optimize the director pattern of LCE structures to maximize viscoelastic dissipation.

Biography: Thao (Vicky) Nguyen received her B.S. from MIT in 1998, and M.S. and Ph.D. from Stanford in 2004, all in mechanical engineering. She was a research scientist at Sandia National Laboratories in Livermore from 2004 to 2007 before joining Johns Hopkins University, where she is currently a Professor in Mechanical Engineering with secondary appointments in Materials Science and Engineering and Ophthalmology. She is also Deputy Director of the Hopkins Extreme Materials Institute. Dr. Nguyen's research encompasses the mechanics of soft tissues, stimuli-responsive soft materials, and engineering polymers. Her lab currently studies the biomechanics of the optic nerve head in glaucoma, the mechanics of recycled polymers, and the mechanical behavior of liquid crystal elastomers and DNA hydrogels.

Dr. Nguyen has received numerous awards, including the 2008 Presidential Early Career Award for Scientists and Engineers (PECASE) and the NNSA Office of Defense Programs Early Career Scientists and Engineer Awards for her work on modeling the thermomechanical behavior of shape memory polymers. In 2013, she received the NSF CAREER award for studying the micromechanisms of growth and remodeling of collagenous tissues, the Eshelby Mechanics Award for Young Faculty, and the Sia Nemat-Nasser Early Career Medal from the Materials Division of ASME. She received the T.J.R. Hughes Young Investigator Award from the ASME Applied Mechanics Division in 2015, the Van C. Mow Medal from the ASME Bioengineering Division in 2024, and the James R. Rice Medal from the Society of Engineering Science in 2025. She is a Fellow of ASME and the American Institute for Medical and Biological Engineering (AIMBE). She served as the President of the Society of Engineering Science (SES) in 2020 and is currently the Editor-in-Chief of the *Journal of Biomechanical Engineering*.

NOVEMBER 18
8:00AM–8:45AM
ROOM LL9, CONVENTION CENTER

David Horsley
Northeastern University

Presenting in Track 14: Micro- and Nano-Systems Engineering & Packaging

Presentation Title: Systems Based on Ultrasonic MEMS: Commercialization and Future Directions

Abstract: The increasing maturity of thin-film piezoelectric materials and the microelectromechanical systems (MEMS) manufacturing ecosystem has enabled the rapid development of sensor systems based on piezoelectric micromachined ultrasonic transducers (PMUTs). In this talk, I will describe work by my research group over the last decade to develop and commercialize PMUT-based systems for consumer electronics applications, starting with air-coupled PMUTs used for time-of-flight (ToF) range-finding and human presence sensing. These ToF sensors were commercialized by my startup, Chirp Microsystems (now part of TDK), and are used today in various products such as smart-locks, robot vacuum cleaners, and laptops. We subsequently developed an ultrasonic fingerprint sensor based on the monolithic integration of PMUTs with CMOS that is used for biometric authentication in consumer products today. A common feature of the ToF sensor and the fingerprint sensor is that they are systems that combine MEMS, integrated circuits, and algorithms. The ability to realize a complete ultrasonic system on chip (SoC) opens new research opportunities in areas such as portable medical imaging systems for point-of care ultrasound (POCUS) as well as wearable ultrasonic devices.

Biography: David A. Horsley is a Professor of Electrical and Computer Engineering at Northeastern University, where he is co-director of the Institute for NanoSystems Innovation (NanoSI), and an Adjunct Professor of Mechanical Engineering at the University of California, Berkeley. Dr. Horsley co-founded several deep-tech companies, most recently Chirp Microsystems (now part of TDK InvenSense), a manufacturer of MEMS-based ultrasonic sensors. Dr. Horsley was Co-Chair of the 2016 IEEE Sensors Conference, Co-Chair of the 2017 Transducers Research Foundation Napa Microsystems Workshop, and Co-Chair of the 2020 IEEE MEMS Conference. Dr. Horsley is an IEEE Fellow, a Fellow of the National Academy of Inventors, a recipient of the National Science Foundation's CAREER Award, the UC Davis Outstanding Junior Faculty Award, the 2016 NSF I/UCRC Association's Schwarzkopf Award for Technological Innovation, the 2018 East Bay Innovation Award, and Northeastern University's 2024 Global Network Accelerator Award. He has authored or co-authored over 200 scientific papers and holds over 30 patents.

NOVEMBER 18
8:00AM–8:45AM
ROOM LL1, CONVENTION CENTER

Robert X. Gao
Case Western Reserve University

Presenting in Track 15: Safety Engineering, Risk and Reliability Analysis

Presentation Title: Exploring Data Science for Enhanced Safety and Reliability in Manufacturing

Abstract: The exponential growth of data as a co-product of manufacturing and computational infrastructure has transformed the state of manufacturing processes and product maintenance into a data-driven paradigm that augments empirical knowledge and model-based analysis, further enhancing technologies for machine condition monitoring, fault diagnosis, and remaining useful life (RUL) prognosis. The result is improved operational safety, higher material and energy efficiencies, and enhanced reliability in prognosis and health management for manufacturing machines and operations. This talk presents an overview of recent advancements in integrating big data analytics with physical domain knowledge to enable effective and efficient information extraction, with the goal to support learned decision-making in equipment and product maintenance, performance management, intelligent process planning, and health system outcomes.

Biography: Robert Gao is the Cady Staley Professor of Engineering and Department Chair of Mechanical and Aerospace Engineering at Case Western Reserve University in Cleveland, Ohio. Since receiving his Ph.D. from the Technical University of Berlin, Germany in 1991, he has been working on physics-based signal transduction mechanisms for process-embedded sensing, multi-resolution analysis, stochastic modeling, and AI/machine learning-based data analytics for manufacturing process control and quality assurance. Professor Gao is a Fellow of the ASME, SME, IEEE, CIRP, and a Distinguished Fellow of the International Institute of Acoustics and Vibration (IIAV). He has published over 400 technical papers, including more than 210 journal articles, three books, and holds 13 patents.

He has received several professional awards, including the ASME Milton C. Shaw Manufacturing Research Medal, ASME Blackall Machine Tool and Gage Award, SME Gold Medal, SME Eli Whitney Productivity Award, IEEE Instrumentation and Measurement Society Technical Award, IEEE Best Application in Instrumental and Measurement Award, ISFA Hideo Hanafusa Outstanding Investigator Award, and ten Best Paper awards. He served as the Chair of the Scientific Committee of the North American Manufacturing Research Institute (NAMRI/SME) and Chair of the CIRP Collaborative Working Group on AI in Manufacturing (CWG-AI). He was a Senior Editor for the *IEEE/ASME Transactions on Mechatronics*, Associate Editor for the *ASME Journal of Dynamic Systems, Measurement, and Control*, *ASME Journal of Manufacturing Science and Engineering*, *IFAC Mechatronics*, *IEEE Transactions on Instrumentation and Measurement*, etc. He was recognized as the Web of Science (WoS) "Highly Cited Researcher in the Field of Engineering" in 2023 and 2024, respectively.

NOVEMBER 19
9:15AM–10:00AM
ROOM LL1, CONVENTION CENTER

Enrico Zio
Politecnico di Milano, Italy

Presentation Title: Risk for the Future, and the Future of Risk Assessment and Management

Abstract: Risk assessment and management is a mature scientific discipline, whose objectives are: identifying the hazards/threats which the system of interest is exposed to; analyzing potential accident scenarios, their causes and consequences; describing risk, possibly quantitatively and with an adequate treatment of the uncertainties associated to the assessment; and using the outcomes of the risk assessment for taking management decisions on preventive and mitigative measures against accidents and their consequences. The risk assessment, in particular, is based on the knowledge available on the system of interest. On the other hand, our world is a technological one and in continuous transformation to meet the objectives and needs of efficiency, flexibility, sustainability, etc., under significant social and environmental pressures. Innovations in technology are continuously being developed for the well-being and to the benefit of all. These innovations generate systems and systems of systems, whose structural, logic, and operational complexity continue to increase. In such evolving technological context, new and unknown hazards and threats emerge, which must be assessed to take appropriate decisions on system licensing, construction, operation, and on asset maintenance and management with the aim to prevent the occurrence of accidents and prepare to mitigate and recover from their consequences, were such accidents to occur.

In this lecture, I attempt to provide a partial view of the evolution of risk and to offer some directions of research and development of risk assessment and management, including:

- The use of simulation for effective accident scenario identification and exploration within the framework of computational risk assessment
- The role of artificial intelligence and machine learning in risk assessment and management

- The combination of complex network theory and input-output inoperability modeling for the risk assessment of systems of systems vulnerable to extreme weather scenarios under climate change scenarios
- The exploitation of monitoring data for the dynamic updating of risk assessment and condition-based risk assessment
- The use of natural language processing for risk analysis
- The contribution of digital twins to adaptive risk assessment and management
- The extension of the framework of risk assessment to resilience analysis

Biography: Dr. Enrico Zio is an internationally renowned expert in risk and resilience assessment, safety analysis, and reliability engineering of complex systems, particularly in the energy sector. He holds M.Sc. degrees in Nuclear Engineering (Politecnico di Milano, 1991) and Mechanical Engineering (UCLA, 1995), and Ph.D. degrees from Politecnico di Milano (1996) and MIT (1998). He is currently Full Professor at École de Mines ParisTech, PSL University, and Politecnico di Milano, where he also serves as Vice-President of the Fondazione. He holds visiting appointments at leading institutions in China and co-directs research centers at Beihang University. Dr. Zio is Scientific Director at Datrix AI Solutions and a Fellow of IEEE, the Prognostics & Health Management Society, and the Asia-Pacific Artificial Intelligence Association.
Dr. Zio pioneered the application of artificial intelligence and genetic algorithms in reliability and risk assessment. His work focuses on modeling complex systems for safety, reliability, and predictive maintenance. He has authored over 500 journal papers and seven books and serves on editorial boards of multiple international journals. Among his numerous awards are the prestigious Humboldt Research Award (2020), ISSS Educator of the Year (2024), the RAMS Alan O. Plait Award (2024), and 2025 ASME Ayyub-Wiechel Risk Analysis Award. His h-index is 101 (Google Scholar).

NOVEMBER 17
9:15AM–10:00AM
ROOM LL9, CONVENTION CENTER

Meimei Li
Argonne National Laboratory

Presenting in Track 16: Special Symposium on Additive Manufacturing Benchmark Test Series Symposium

Presentation Title: Accelerated Qualification of Additively Manufactured Materials for Nuclear Energy Applications

Abstract: The advancement of nuclear energy technologies necessitates the development and qualification of materials capable of withstanding extreme conditions such as high temperatures, stress, radiation, and corrosive environments. Traditional material qualification processes are often time-consuming and costly, creating significant barriers to the rapid deployment of innovative materials and manufacturing techniques. Additively manufactured (AM) materials offer transformative potential for the nuclear energy sector by enabling enhanced design flexibility, improved performance, and reduced costs. However, qualifying these materials for nuclear applications presents significant challenges due to their unique characteristics and stringent requirements for safety, reliability, and long-term performance of reactor structural materials. This presentation discusses an accelerated qualification framework for AM materials in nuclear energy systems.

This accelerated qualification framework integrates scientific understanding with engineering data, using predictive modeling and machine learning/artificial intelligence (ML/AI) tools to enhance the prediction of material behavior and performance limits in nuclear environments. Central to this approach is the establishment of robust processing-structure-property-performance (P-S-P-P) relationships, which are crucial for predicting the long-term behavior of additively manufactured (AM) materials in nuclear environments. By understanding how manufacturing processes influence microstructure and, consequently, material properties and performance, predictive models can be developed to inform design decisions and optimize performance. The approach utilizes high-throughput testing and advanced characterization techniques to rapidly generate comprehensive datasets that are essential for understanding the complex interactions between material composition, processing conditions, and environmental factors. *In situ* process monitoring provides real-time insights into the quality and integrity of fabricated parts, improving quality control. Combined with AI/ML tools, this data accelerates the assessment and optimization of material properties, supporting a more efficient and reliable qualification process. Computational tools complement experimental data by providing predictive insights into the P-S-P-P relationships and extrapolating long-term behavior. Sensitivity analysis and uncertainty quantification

are employed to understand the underlying physics and reliably predict material performance beyond testing conditions.

A case study on laser powder bed fusion (LPBF) 316H stainless steel illustrates the framework's potential to expedite the qualification process for high-temperature nuclear structural applications. We will highlight a benchmark study focused on predicting creep properties of additively manufactured components with a simple test geometry. The potential for digital qualification of AM components for use in nuclear reactors employing the Multi-Dimensional Data Correlation (MDDC) platform, leveraging digital twins, manufacturing data, process monitoring, machine learning, data analytics, Non-Destructive Evaluation (NDE), and integration into codes and standards will also be discussed, along with the approach combining neutron and ion irradiations with physics-based modeling for accelerated material qualification for radiation effects and evaluations of corrosion effects in various reactor environments, focusing on the unique characteristics of additively manufactured materials.

Biography: Dr. Meimei Li is a materials scientist in the Nuclear Science and Engineering Division, Argonne National Laboratory. She leads the DOE Office of Nuclear Energy Advanced Materials and Manufacturing Technologies (AMMT) program as the National Technical Director (NTD). She has broad research experience, including radiation damage, corrosion, alloy development, testing, characterization qualification, and advanced manufacturing in support of a broad range of nuclear reactor technologies. Prior to joining the ANL, she worked at the Materials Science and Technology Division at the Oak Ridge National Laboratory.

NOVEMBER 19
9:15AM–10:00AM
ROOM LL7, CONVENTION CENTER

Nestor Riosa
Vice President, Outage Services
Mitsubishi Power Americas

Presenting in Track 17: Special Symposium on Power

Biography: Nestor Riosa is the Vice President of Outage Services at Mitsubishi Power Americas, bringing 34 years of experience in the power generation industry. Over the years, he has held various roles in power plant operations and maintenance, contract negotiation and execution, generator service, and engineering. In his current role, he leads a team responsible for executing power plant outage work at customer sites across the Americas region. Nestor is passionate about developing people and ensuring safety.

NOVEMBER 17
9:15AM–10:00AM
ROOM LL10, CONVENTION CENTER

Dr. Huijuan Dai
DOE's Smart Manufacturing Portfolio and Strategy,

Abstract: The U.S. manufacturing sector is fundamental to the national energy industrial base, supporting energy generation, distribution, and end-use. However, challenges related to high-performance materials, secure supply chains, digital agility and workforce threaten its capacity to support modern energy systems. Smart manufacturing offers a transformative approach to designing, producing, and delivering energy technologies to overcome these strategic obstacles. This presentation will detail the DOE's Smart Manufacturing portfolio and strategy, showcasing impactful projects and future funding opportunities. We will also highlight resources supporting the ecosystem and fostering collaborations, such as national lab user facilities, relevant consortia, and Manufacturing USA institutes that provide capabilities for scaling smart manufacturing solutions.

Biography: Dr. Huijuan Dai serves as the Supervisory Program Manager for the Next Generation Materials & Processes Program in the U.S. Department of Energy (DOE) Advanced Materials and Manufacturing Technologies Office (AMMTO). Her portfolio includes research, development, and pilot demonstrations for technologies that cover smart manufacturing, additive manufacturing, high performance computing, cyber security for manufacturing, and advanced materials. Dr. Dai's responsibilities include oversight of three Manufacturing USA institutes and two user facilities at Oak Ridge National Laboratory. Before joining DOE, Dr. Dai spent 10 years at GE driving industry research and technology development across energy, aerospace and transportation sectors. She played a key role in shaping the vision and technology strategies for advancing and implementing emerging technologies and high-value advanced manufacturing opportunities. She has a Ph.D. in Materials Science from the University of Leicester in the UK, and an MBA from the University of South Carolina.

NOVEMBER 18
8:00AM–8:45AM
ROOM LL10, CONVENTION CENTER

Dr. Christopher J. Saldaña
AMMTO Office Director

Title: Manufacturing and Materials Innovation for America's Energy Future

Abstract: In this talk, we will explore the pivotal role of new materials and manufacturing innovations in bolstering America's energy future. Emphasizing goals of supply chain security and industrial competitiveness, we will highlight how cutting-edge technologies can drive a dominant American energy sector. We will delve into specific advancements in material science and manufacturing processes that are transforming the industry, ensuring long-term economic and environmental benefits. We will discuss opportunities for collaboration with the Department of Energy, providing insights into how stakeholders can engage in and benefit from these technological advancements. Join the conversation to discuss how materials and manufacturing innovation can and will shape our nation's energy sector.

Biography: Dr. Christopher Saldaña is the director of the U.S. Department of Energy's (DOE) Advanced Materials and Manufacturing Technologies Office (AMMTO). As director of the office, Dr. Saldaña is leading the office's strategy, management, and execution to advance materials and manufacturing technologies for the energy industrial base. Dr. Saldaña joined DOE from Georgia Tech's George W. Woodruff School of Mechanical Engineering, where he served as the Ring Family Professor of Mechanical Engineering. Prior to that role, he held the Harold and Inge Marcus Career Professorship at the Pennsylvania State University and worked as a research engineer at M4 Sciences Corporation. Dr. Saldaña received his B.S. degree from Virginia Tech, and his M.S. and Ph.D. degrees from Purdue University.

Conference Wide Panels

WEDNESDAY, NOVEMBER 19

SPECIAL PANEL: RELIABILITY AND SUSTAINABILITY: MUTUAL BENEFIT
8:00AM–9:00AM
LL1, CONVENTION CENTER

As the impacts of climate change become increasingly evident, the need for adaptation and sustainable practices has never been more critical. This panel will explore the intersection of reliability and sustainability, emphasizing how a circular economy and other initiatives can provide mutual benefits for both businesses and the environment. By adopting circular principles, organizations can enhance their reliability while minimizing waste and resource consumption. Our discussion will dig into innovative strategies and collaborative approaches that empower industries to thrive in a changing climate, fostering resilience and sustainability for future generations.

Moderators

Dr. Mohammad Pourgol
University of Maryland

Dr. Mihai Diaconeasa
North Carolina State University

Panelists

Dr. Enrico Zio
Politecnico di Milano

Dr. Stephen Ekwaro-Osire
Texas Tech University

Dr. Bilal Ayyub
University of Maryland

Dr. Mohammad Modarres
University of Maryland

Dr. James Ezhaya
Schneider Electric

LECTURE ON INNOVATIONS IN ENGINEERING RESOURCE MANAGEMENT AND CAPACITY
8:00AM–9:00AM
LL2, CONVENTION CENTER

Engineering is vital to our world development at a pace never seen before, and rapid expansion is the expectation. How companies and people are able to address this is woefully slow to develop. The limitations and obstacles to overcome are discussed and what achievable outcomes can look like will be discussed. The audience is part of both sides of the equation—client and supplier. Becoming comfortable with the paradigm shift and getting educated with the digital opportunities will advance the demand-side companies' competitive advantage from the shift over others. Same for the supply side. The audience will THINK about how they do work today, what their goals are, their challenges to success, and what they can add to their plans "new depths of opportunity" not "mainstream" to engineering management today.

Lecturer
Chris Bollas
Giga Techspace Inc.

Chris Bollas has 25 years in C-Suite management for technical product companies serving ASME customers and MEP market.

SPECIAL PANEL: ENERGY TRANSITION FRONTIERS AND RESILIENCE PANEL
8:00AM–9:00AM
LL3, CONVENTION CENTER

- Existing and new energy trends; Energy security and critical materials for domestic energy supply chain; Role of big data analytics, AI/ ML in driving the future energy research; and Technology innovation though collaborative efforts between academia, industries, national labs, and policy makers
- Accelerating battery research and development with machine learning, from molecular discovery to system-level optimization and commercialization
- Improving modeling accuracy and data efficiency using physics-informed machine learning for material discovery and design acceleration
- Predicting and managing battery degradation through AI-driven analysis and reliability forecasting

Moderator:
Mustafa Erguvan
University of Alabama, Tuscaloosa, Alabama

Panelists
Dr. Rishi Roy
Sandia National Laboratories, Livermore, California

Dr. Yucheng Fu
Pacific Northwest National Laboratory, Richland, Washington

Dr. Shahriar Amini
University of Alabama, Tuscaloosa, Alabama

SPECIAL PANEL: ARTIFICIAL INTELLIGENCE IMPLEMENTATION AND CHALLENGES IN INDUSTRY
8:00AM–9:00AM
LL9, CONVENTION CENTER

The emergence and growth of artificial intelligence (AI) in research and industrial implementation have been on the rise for the last few years. Academic institutions have shown an increased focus on AI with new initiatives such as seed grants, hiring new faculty with AI expertise, AI-focused classes and seminars, etc. Industry and government agencies are also gearing toward using AI methodologies and techniques to improve operating and product efficiency. This panel discusses how the industry and government agencies are ramping their efforts to implement AI.

What is discussed:

- AI Implementation in Industry: Learn more about AI implementation in large corporations and small to medium manufacturers.
- What are the prerequisites? Before venturing into implementing AI in the industry, what are the Dos and Don'ts?
- Government agency's roles: How are government agencies helping and coordinating these new challenges? How are academic researchers and industry partners working together toward successful AI implementation in the industry?
- Role of students: What is the industry looking for in new students/intern hires concerning AI skill set?

Moderators

Dr. Sekhar Rakurty has over a decade of experience in industrial research and development in the manufacturing sector, focusing on cutting and machine tool design, as well as advancing sustainable, AI-assisted manufacturing processes. He earned both his M.S. and Ph.D. in Mechanical Engineering from the University of Utah. Dr. Rakurty holds more than 16 approved patents across the United States, Canada, India, Japan, Australia, the United Kingdom, the European Union, Ireland, and Mexico, with five additional patents pending. His patented technologies are commercially available and used by a global customer base. He has authored over 25 peer-reviewed publications in leading international journals and conferences. He currently serves as the industrial Principal Investigator on multiple federally and industry-funded research projects focused on developing advanced manufacturing methods and cutting tools for extreme environments. Dr. Rakurty is the Vice Chair of the ASME Board on Standardization and Testing, an Associate Editor for the *Machining Science and Technology* journal, and an Adjunct Professor in the Department of Mechanical Engineering at the University of Akron.

Dr. Muhammad P. Jahan is a tenured Associate Professor in the Mechanical and Manufacturing Engineering Department at Miami University. He was the graduate program director of the Mechanical Engineering graduate program from Jan. 2020 to July 2023. Dr. Jahan completed his Ph.D. from National University of Singapore in 2010 and worked as a Postdoc at the University of Arkansas (2010–2012) and as a tenure-track Assistant Professor at Western Kentucky University (2012–2016). Dr. Jahan worked at Makino Asia Pte Ltd. as an R&D Engineer (2009–2010) before returning to academia. Dr. Jahan's research interests are in the areas of Advanced, Additive, Subtractive, Hybrid, and Micro, and Nano Manufacturing. Dr. Jahan's research has been supported by federal, state, and industry

grants including NSF, NSF-KY EPSCoR, ODHE, NASA OSGC, LAM Research Corporation, M K Morse Company, and Bullen Ultrasonics. He has received a total of over $3M from internal and external grants as PI and co-PI and published over 150 peer-reviewed articles in refereed journals and conferences. He received four best paper awards including the “Outstanding Paper Award” from the Society of Manufacturing Engineers (SME, USA) and the “A.M. Strickland” prize from the Institute of Mechanical Engineers (IMechE, UK). Dr. Jahan is a Fellow of American Society of Mechanical Engineers (ASME), and an active member of the Society of Manufacturing Engineers (SME) and American Society for Engineering Education (ASEE).

Panelists

Vinija Jain leads a GenAI team at Google focused on refining and extending Gemini’s agentic capabilities. Before joining Google, she was at Meta, where she developed intelligent, high-impact solutions to optimize advertiser outcomes and user engagement. Prior to Meta, she founded and led an agentic AI startup in the customer support space, driving the development of autonomous agents that streamlined customer interactions and enhanced service quality for enterprise clients. Earlier in her career, she worked at Amazon Music, where she contributed to personalization and voice experiences, helping integrate music intelligence within Alexa. Vinija’s work lies at the intersection of product innovation and applied research, spanning areas such as generative modeling, user modeling, conversational AI, and reinforcement learning. She has co-authored papers in leading conferences and journals, including ACL, EMNLP (Outstanding Paper Award ‘23), AAAI, EACL, ECML, WSDM, CVPR, WACV, and ICASSP, and maintains a blog at vinija.ai.

Aman Chadha manages a Generative AI team of scientists and managers at Apple, focusing on training and deploying GenAI models for Apple Intelligence. Prior to this, he managed a GenAI team of scientists and managers at AWS, responsible for LLM/VLM models for a range of use-cases including document processing, synthetic data generation, and customer support. During his tenure at Amazon Alexa AI, he spearheaded Query Understanding and Personalization, enhancing user interactions while maintaining safety and reliability. At Apple, as part of the Machine Intelligence Neural Design (MIND) team, he specialized in designing on-device multimodal AI models for applications including NLP, Computer Vision, and Speech Recognition. In parallel to his industrial role, Aman actively advises projects in academia, focusing on areas such as LLMs, prompt engineering, hallucination detection, bias and fairness, and multimodal AI. He has co-authored papers in leading conferences and journals, including ACL, EMNLP, AAAI, EACL, ECIR, ECML, WSDM, CVPR, WACV, ICASSP, etc. His work has been featured in media outlets such as *The Washington Post*, *MIT Technology Review*, *Nature*, *Wikipedia*, *New Scientist*, *Analytics India Magazine*, and *YourStory*.

Satish Bukkapatnam is a Regents Professor and Rockwell International Professor of Industrial & Systems Engineering at Texas A&M University. He also serves as a program director at the NSF Advanced Manufacturing Program. He received his Ph.D. degree in Industrial and Manufacturing Engineering from Pennsylvania State University. His research interests are broadly in smart and precision manufacturing. He is a Fellow of IISE and SME, Associate member of CIRP, and was a Fulbright-Tocqueville Distinguished Chair.

Dr. Purvee Bhatia is a Research Engineer in AI and Smart Manufacturing Innovation at the University of South Florida’s Smart and Sustainable Systems Lab. Her work lies at the intersection of agentic AI, computer vision, and edge computing, where she develops intelligent systems for real-time process optimization and decision-making in advanced manufacturing environments. She specializes in Vision Transformers, AI agents, and advanced process analytics for smart manufacturing. Dr. Bhatia’s research bridges advanced research and industrial applications designing AI-driven frameworks that improve quality, operational efficiency, and sustainability, particularly for small and medium-sized enterprises. A Lean Six Sigma Black Belt and recipient of the McKinsey Forward Program Badge, she drives transformation through practical, scalable, and human-centered AI solutions. Beyond her research, Dr. Bhatia has served as a consultant with FloridaMakes, where she designed and delivered training on AI and edge computing for educators and industry professionals. She leads strategic planning for the Introduction to Production Systems Certificate course to improve learner engagement, retention, and curriculum alignment with industry priorities. Her work has led to peer-reviewed publications and invited talks in the field of smart and sustainable manufacturing. She has also mentored several graduate and undergraduate students in research on machine vision, additive manufacturing, and predictive modeling. She also holds a bachelor’s degree in aerospace engineering where she worked on debris removal from lower earth orbits and has also worked with Tata Lockheed Martin Aerostructures (India) where, she contributed to the digitization of manufacturing workflows for tactical airlifters, such as the C-130J Super Hercules during her tenure.

Special Events

SUNDAY, NOVEMBER 16

PROFESSIONAL DEVELOPMENT WORKSHOP FOR UNDERGRADUATE, GRADUATE STUDENTS, AND VERY EARLY CAREER RESEARCHERS
1:00PM–2:00PM
ROOM LL1, CONVENTION CENTER

ElevateMe

Learn and grow in the following areas: How to make professional connections and maintain through social media and Enhancing professional writing and speaking/presentation skills and other "soft skills."

FIRST-TIME ATTENDEE ORIENTATION
2:00PM–3:00PM
ROOM LL10, CONVENTION CENTER

ElevateMe

First-time attendees to IMECE are cordially invited to this informal yet informative session to learn about how to navigate the conference, how to use the program, the new App, and more importantly, where all the best parties are. Snacks and refreshments will be served.

FUTURE OF MECHANICAL ENGINEERS WITH ASME LEADERS
3:00PM–4:00PM
ROOM LL1, CONVENTION CENTER

ElevateMe

Dive deep into the latest trends, innovations, and challenges shaping the future of mechanical engineering. Connect with ASME leaders, gain career insights, and network with top professionals in mechanical engineering.

Speakers

Thomas Costabile, P.E.
Executive Director/CEO
ASME

Lester K. Su, Ph.D.
President
ASME

MONDAY, NOVEMBER 17

PANEL ON CMMI RESEARCH OPPORTUNITIES
10:20AM–12:05PM
ROOM LL4, CONVENTION CENTER

Representatives from the Civil, Mechanical and Manufacturing Innovation (CMMI) Division of the National Science Foundation (NSF) will introduce divisional and Foundation-wide funding opportunities to CMMI communities of researchers and have a live Q&A with audience. This session will be of greatest benefit to current faculty members (all ranks) at U.S. Institutions.

CMMI Representatives:
Linkan Bian, **Marcello Canova**, **Siddiq Qidwai**

ENTREPRENEURSHIP IN ENGINEERING WORKSHOP
10:30AM–12:00PM
ROOM LL6, CONVENTION CENTER

Advanced purchase required

SYNCHRONOUS CONDENSER CONVERSIONS PANEL
10:20AM–12:05PM
ROOM LL7, CONVENTION CENTER

Synchronous condensers are critical to a stable and resilient electric power grid because they address several key challenges introduced by the shift away from traditional synchronous generators (like those in fossil fuel and nuclear plants) toward inverter-based renewable energy sources (like solar and wind). Their importance stems from their ability to provide essential grid-stabilizing physics of traditional power plants—inertia, reactive power, and system strength—without generating electricity or emissions.

What will be discussed: Generators conversion into synchronous, synchronous condenser operation, asset and infrastructure reuse/retired plants, and grid inertia.

NUCLEAR RENAISSANCE: STRENGTHENING TODAY'S FLEET AND POWERING TOMORROW'S ENERGY DEMANDS
1:40PM–3:25PM
ROOM LL8, CONVENTION CENTER

The nuclear industry is experiencing unprecedented momentum, driven by federal incentives, rising global energy demand, and the need for reliable, carbon-free power. This panel will examine both sides of the emerging nuclear renaissance: optimization of the existing fleet and development of next-generation reactors.

PANEL ON CBET RESEARCH OPPORTUNITIES
1:40PM–3:25PM
ROOM LL4, CONVENTION CENTER

Representatives from the Chemical, Bioengineering, Environmental, and Transport Systems (CBET) Division of the National Science Foundation (NSF) will introduce divisional and Foundation-wide funding opportunities to CBET communities of researchers and have a live Q&A with the audience. This session will be of greatest benefit to current faculty members (all ranks) at U.S. Institutions.

CBET Representatives:
Harsha Chelliah, Shahab Shojaei-Zadeh

FE/PE OVERVIEW SESSION/WORKSHOP
1:40PM–3:25PM
ROOM LL7, CONVENTION CENTER

ElevateMe

Join Industry and Academic persons with PE specialty to talk about the importance and benefit of a PE license. Receive guidance on FE and PE Exams: Background, Syllabus, Reading Materials Suggestions, Where to find help, and more...

PLANT PERFORMANCE TESTING AND ASME PERFORMANCE TEST CODES
3:45PM–5:30PM
ROOM LL7, CONVENTION CENTER

The panel will provide an overview of the ASME Performance Test Code (PTCs) and their evolving role in supporting reliable, transparent performance evaluations across a wide range of power plant systems and equipment. PTCs provide a level playing field for both manufacturers and users of power plant systems and equipment by establishing uniform rules and procedures for the planning, preparation, execution, and reporting of engineering performance tests. These tests are designed to produce objective and repeatable results under controlled conditions, enabling direct comparison to contractual guarantees, design specifications, or previous test benchmarks.

EXHIBIT HALL GRAND OPENING AND OPENING RECEPTION
5:30PM–7:00PM
EAST HALL, CONVENTION CENTER

All registrants are invited to this special event to celebrate the opening of the IMECE exhibits. Come grab a drink and some food, meet this year's group of exhibitors, and learn about their products and services.

UNDERGRADUATE RESEARCH AND DESIGN EXPO STUDENT POSTER COMPETITION
5:30PM–7:00PM
EAST HALL, CONVENTION CENTER

Poster Setup	2:00PM–4:00PM
Judging	4:00PM–6:15PM
Expo (General Viewing)	5:30PM–7:00PM
Winners Announced	6:15PM–6:30PM

The student expo provides undergraduate engineering students with a professional and technical forum for presenting their research, design project, and other engineering solutions and endeavors to top researchers and scientists from academia, industry, government, prospective employers, entrepreneurs graduate schools, and potential faculty advisors.

MEET-UP AND NETWORKING AT THE FISHBOWL AT THE PYRAMID
7:30PM–9:30PM

ElevateMe

Extend the networking opportunities into the evening at our casual meet-up reception, where you can relax and connect with industry peers in a more informal setting.

Preregistration required.

TUESDAY, NOVEMBER 18

BRIDGING THE GAP: CRITICAL RESEARCH NEEDS ON SOLAR THERMAL TECHNOLOGIES IN EVOLVING ELECTRICITY AND INDUSTRIAL PROCESS HEAT MARKETS
9:05AM–10:50AM
ROOM LL4, CONVENTION CENTER

The panel gathers researchers from national labs, academia, and leading industry to introduce and present the value of the concentrating solar power (CST/CSP) technology, thermal energy storage (TES) technologies, and their applications in various sectors such as electrical grid, industrial process heat, and the upcoming data center energy challenges. Various types of CSP technologies can generate heat with a wide temperature range from 100°C to 1000°C and, by combining with TES, provide firm energy supply with a high capacity factor. The success of CSP in the abroad market would continue encouraging the research, development, and development (RD&D) in the United States.

DOE-NSF PROGRAM OFFICER PANEL ON ADVANCED MANUFACTURING
9:05AM–10:50AM
ROOM LL10, CONVENTION CENTER

Program officers from Department of Energy (DOE) Advanced Materials and Manufacturing Technologies Office (AMMTO) and National Science Foundation (NSF) Advanced Manufacturing Program will discuss agency priorities and vision on advanced manufacturing, including the development of national strategic plan and resources available to the advanced manufacturing community. Program officers will discuss funding opportunities related to advanced manufacturing and answer questions from the audience.

The Next Generation Materials and Processes (NGMP) Program at DOE's AMMTO office supports Research, Development, and Demonstration (RD&D) to accelerate foundational, cross-cutting energy materials and manufacturing process technologies across the Department's mission areas. The program supports the AMMTO office's vision of a globally dominant, innovative U.S. manufacturing and industrial base for a resilient energy system and secure supply chain.

NSF Advanced Manufacturing (AM) program supports the fundamental research needed to revitalize American manufacturing to grow the national prosperity and workforce, and to reshape our strategic industries. The AM program accelerates advances in manufacturing technologies with emphasis on multidisciplinary research that fundamentally alters and transforms manufacturing capabilities, methods, and practices.

PROPOSAL WRITING WORKSHOP
4:45PM–6:00PM
ROOM LL4, CONVENTION CENTER

In this workshop, National Science Foundation (NSF) program directors will cover the fundamentals of grant proposal writing for NSF. Participants will learn about key topics, including the components of a successful proposal and finding the right home for the research. Critical aspects of the merit review process will be presented. This workshop is geared towards early career and aspiring investigators at U.S. institutions seeking to understand the NSF merit review process, although the information provided will be valuable to principal investigators in any stage of their career seeking to learn more about proposal writing.

NSF Representatives:
Linkan Bian, Marcello Canova, Harsha Chelliah, Siddiq Qidwai, Shahab Shojaei-Zadeh

DOE NATIONAL LABS DIGITAL PLATFORMS DEMONSTRATION
2:45PM–6:30PM
ROOM LL9 & LL10, CONVENTION CENTER

Representatives from the U.S. Department of Energy (DOE)'s Advanced Materials and Manufacturing Technologies Office (AMMTO) and DOE national labs will showcase DOE funded projects and digital platforms, as well as available resources and collaboration opportunities that are open to public.

Session Opening
Dr. Christopher J. Saldaña
DOE AMMTO Office Director

- ORNL Session 1: The ORNL Manufacturing Demonstration Facility's Digital-First Environment
- ORNL Session 2: The ORNL Manufacturing Demonstration Facility: Modeling Tools Direct to Industry
- HPC4EI Session: The High-Performance Computing for Energy Innovation program
- PNNL Session: Shear Assisted Processing and Extrusion (ShAPE™) (TBC)

RISING STARS OF MECHANICAL ENGINEERING
1:15PM–2:45PM
EAST HALL, CONVENTION CENTER

Sponsored by

University of Mississippi
School of Engineering
Department of Mechanical Engineering

The ASME Rising Stars of Mechanical Engineering Celebration and Showcase at the International Mechanical Engineering Congress and Exposition (IMECE) is a prestigious event designed to honor early-career researchers who have received recognition through NSF CAREER, ONR YIP, AFOSR YIP, DARPA YFA, and NIH New Innovator Awards.

This reception-style celebration commences with a brief introduction, followed by a poster session during which Principal Investigators (PIs) are invited to present their innovative work. Subsequently, a networking period allows PIs to connect with their peers and other professionals in the field.

East Hall, Convention Center

Poster Setup	9:00AM–10:00AM
General Viewing	1:15PM–2:45PM
Recognition Announcements	2:30PM–2:45PM

APPLIED MECHANICS DIVISION YOUNG MEDALIST SYMPOSIUM
3:00PM–5:00PM
ROOM LL8, CONVENTION CENTER

Gustus L. Larson Memorial Award
3:00PM–3:20PM

Kejie Zhao, Ph.D.
Purdue University

Mechanics, Heterogeneity, and Dynamics in Particle Networks

Thomas JR Hughes Young Investigator Award
3:20PM–3:40PM

X. Shelly Zhang
University of Illinois at Urbana-Champaign

Bridging Inverse Design and Additive Manufacturing of Programmable Materials

Eshelby Mechanics Award for Young Faculty
3:40PM–4:00PM

Anna Tarakanova
University of Connecticut

Molecular Computation for Bioengineering

Zdeněk P. Bažant Medal
4:00PM–4:20PM

Huck Beng Chew
University of Illinois at Urbana-Champaign

Machine Learning in Mechanics: Bridging Scales in Materials Damage Modeling

WARNER T. KOITER MEDAL
5:00PM–6:00PM
ROOM LL7, CONVENTION CENTER

Jean-Baptiste Leblond, Ph.D.
Institut Jean Le Rond d'Alambert Sorbonne Université

A New Method for Solving 3D Problems of Out-of-Plane or Out-of-Surface Perturbations of Cracks, with Some Applications to Mixed-Mode Propagation

PER BRUEL LECTURE
6:00PM–7:00PM
ROOM LL1, CONVENTION CENTER

Tony Jun Huang, Ph.D.
Duke University

Acoustofluidics: Harnessing Acoustics and Fluid Mechanics for Biomedical Innovations

APPLIED MECHANICS DINNER
6:30PM–9:00PM
MEMPHIS SHERATON HOTEL - NASHVILLE, 2ND FLOOR

Timoshenko Medal Lecture

Norman A. Fleck, Ph.D.
Professor of Mechanics of Materials
Cambridge University Engineering Dept.

WEDNESDAY, NOVEMBER 19

JOURNEY TO SUSTAINABILITY PANEL
8:00AM–9:00AM
ROOM LL7, CONVENTION CENTER

The "Journey to Sustainability" panel brings together experts, innovators, and leaders from various sectors to explore the path towards a more sustainable future. The panel focuses on innovative solutions and technologies that engineers are developing to address pressing environmental challenges. From renewable energy systems and sustainable materials to strategies for reducing carbon footprints, this panel highlights how engineering principles are being reconceptualized to create a more sustainable world. Attendees, particularly early-career professionals and students, will gain insight into how sustainability is being integrated across engineering disciplines and where new opportunities for contribution and leadership are emerging.

DOE DIGITAL PLATFORMS STOP-BY SESSIONS
2:45PM–6:00PM
ROOM LL10, CONVENTION CENTER

- **Damara Tern**
  Damara Tern is a new software framework for digital manufacturing data management. Built with a flexible, operation- and trackable-centric model, it organizes metadata across machines, processes, and sites to preserve the full digital thread of component creation. Implemented on a Django web architecture with PostgreSQL, it supports secure access, powerful search, visualization, and integration with tools like Peregrine for advanced analysis and cross-site collaboration
- **AdditiveFOAM**
  AdditiveFOAM is a computational framework for simulating transport phenomena in additive manufacturing (AM) processes. Built on OpenFOAM, a leading open-source computational fluid dynamics software, AdditiveFOAM uses advanced finite volume methods to solve complex multiphysics problems. This tool can simulate explicit part geometries and scan paths, and it supports coupling with ExaCA to enable process-structure predictions. These capabilities make it a powerful tool for addressing processing challenges in AM. Applications include AM, processing, heat transfer, and high-performance computing.
- **ExaCA**
  ExaCA is a C++ application designed to predict as-solidified grain structures from input time-temperature history data. Built with message passing interface (MPI) and Kokkos, ExaCA supports scalable, performance-portable simulations across many central processing unit (CPU) and graphics processing unit (GPU) architectures. To achieve this, the tool uses approximations for heterogeneous nucleation, the solidification velocity-undercooling relationship, and dendrite geometry in cubic crystals. ExaCA's ability to couple with various process models and leverage GPUs gives it the ability to handle up to billions of computational cells efficiently, which makes it a powerful tool for large-scale microstructure simulations. Applications include AM, microstructure, high-performance computing, and GPUs.

MATERIALS DIVISION AWARDS SYMPOSIUM
3:00PM–5:00PM
ROOM LL4, CONVENTION CENTER

Sia Nemat-Nasser Early Career
3:05PM–3:25PM
Award Lecture

Grace X Gu
UC Berkeley

Programming Composite Materials with Aperiodic Monotiles

Orr Early Career Award Lecture
3:25PM–3:45PM

Christos Athanasiou
GaTech

Lightning-Speed Fracture Discoveries: Unlocking Knowledge for Polymers and Recyclates

Centennial Mid-Career Award Lecture
3:45PM–4:15PM

Thao (Vicky) Nguyen
Johns Hopkins University

Computational Modeling of a Dynamic Polymerization DNA Hydrogel

Nadai Medal Lecture
4:15PM–5:00PM

Vikram Deshpande
University of Cambridge

Mechanics of Living Cells and Their Organization During Morphogenesis

GOVERNMENT AGENCY AND RESEARCH POSTER SESSION
12:15PM–2:15PM
EAST HALL, CONVENTION CENTER

Undergraduate and graduate students are invited to present and/or compete with their posters based on work from NSF-funded research. This forum provides the students with an opportunity to disseminate their research to their junior, peer, senior, and experts-in-the-field colleagues. IMECE provides a unique environment for students to interact with fellow researchers from single-focus, multidisciplinary, and/or international backgrounds. The track is divided into the topics of (1) NSF-funded research grants/programs and (2) Research Experience for Undergraduates (REUs).

Poster Setup	9:00AM–10:00AM
Judging	10:00PM–2:15PM
General Viewing	12:15PM–2:15PM
Research Winners Announced	2:00PM

THURSDAY, NOVEMBER 20

THURSTON LECTURE
9:15AM–10:00AM
ROOM LL1, CONVENTION CENTER

Gang Bao
Rice University

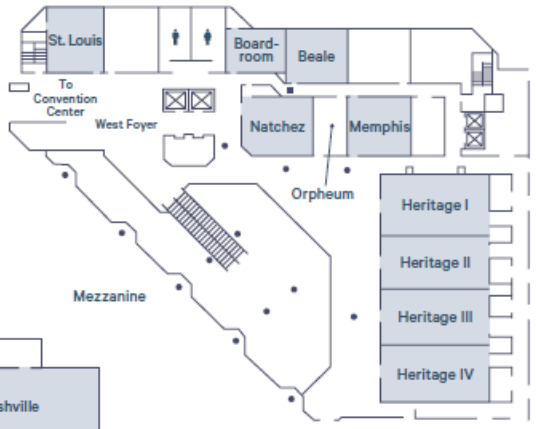
Harnessing Nanomaterials for Health Innovation

CLOSING RECEPTION
5:30PM–6:30PM
SHERTON HOTEL, MAGNOLIA BALLROOM, 1ST FL

Floor Plans

Sheraton
MEMPHIS DOWNTOWN HOTEL

Floor Plans & Capacity Chart



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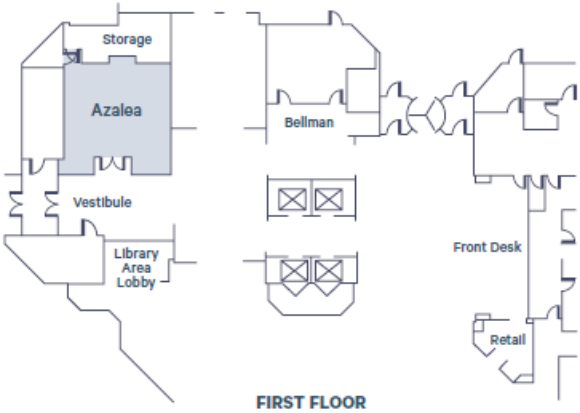
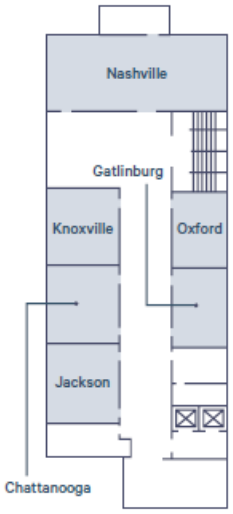


FIRST FLOOR



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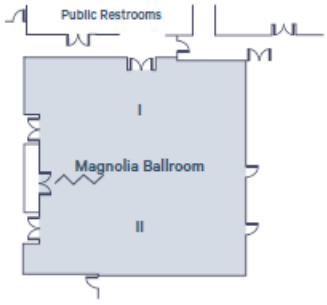
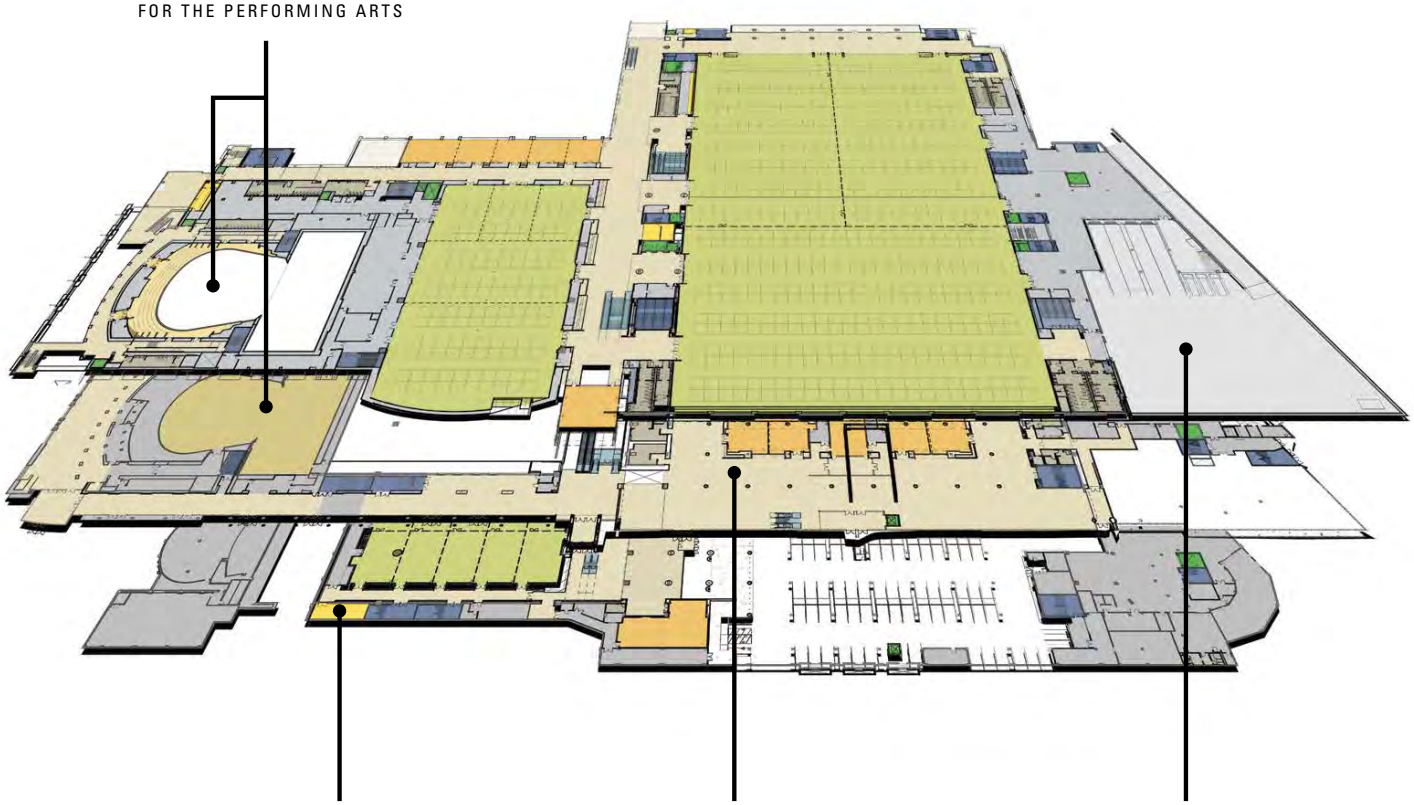


FIRST FLOOR

CANNON CENTER

FOR THE PERFORMING ARTS



LOWER LEVEL

FLEX HALL/MEETING ROOMS

LEVEL 1

MAIN STREET LOBBY/MEETING ROOMS

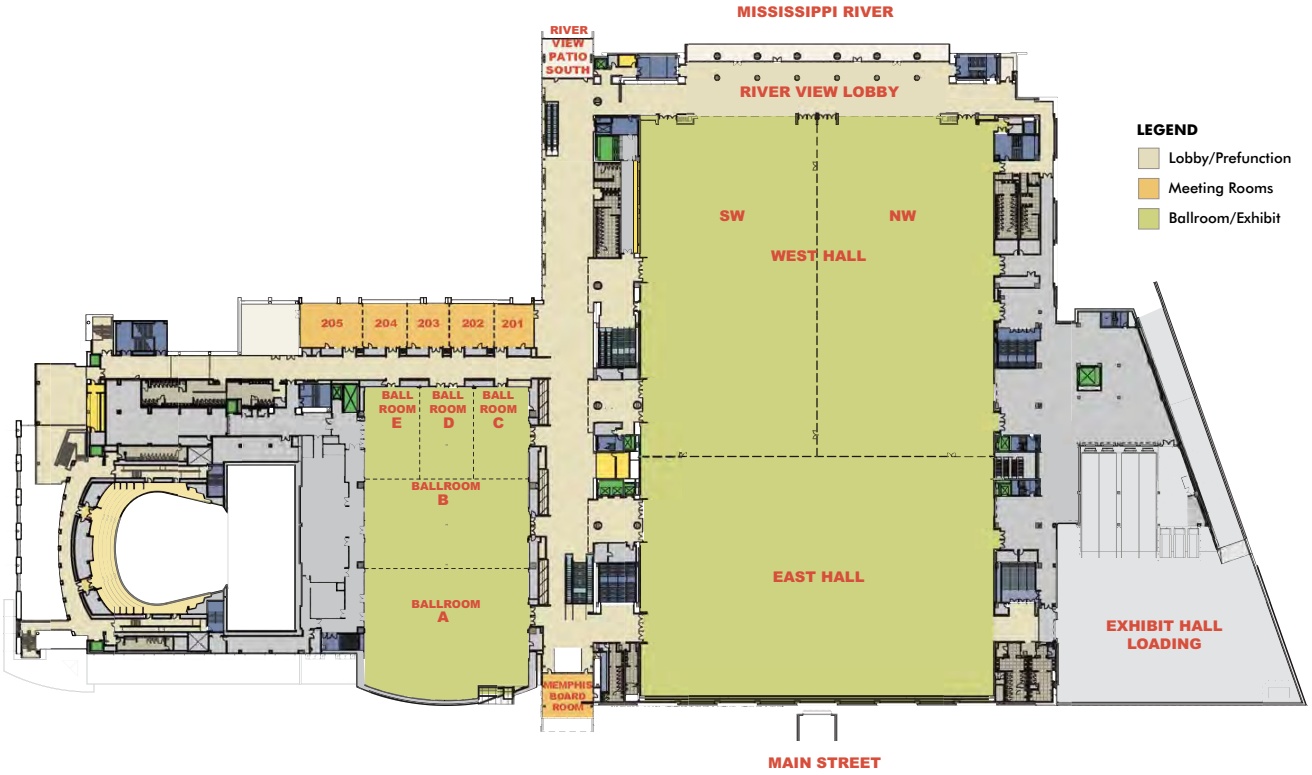
LEVEL 2

EXHIBIT HALL/BALLROOM

Please note: All information, including measurements and square footage, is estimated and subject to change throughout the renovation process. Capacities listed are maximized and do not take into consideration stage or production. Renderings and floor plans are courtesy of LRK and tvsdesign.

LEVEL 2
SPECIFICATIONS

The 118,000-square-foot, column-free Exhibit Hall can be used as an impressive Main Hall or split into three smaller halls. This level also offers a 28,000-square-foot Grand Ballroom which can be divided into five smaller sections if needed. Five meeting rooms offering 16-foot ceilings and natural light complement the overall space. A spacious pre-function foyer located outside the Exhibit Hall and the Ballroom is perfect for registration. But it's this level's views that will really grab your attention: The Memphis Board Room, a three-sided glass space, cantilevers over Main Street for downtown views, while an outdoor terrace overlooking the Mississippi River provides a relaxing place for breaks.



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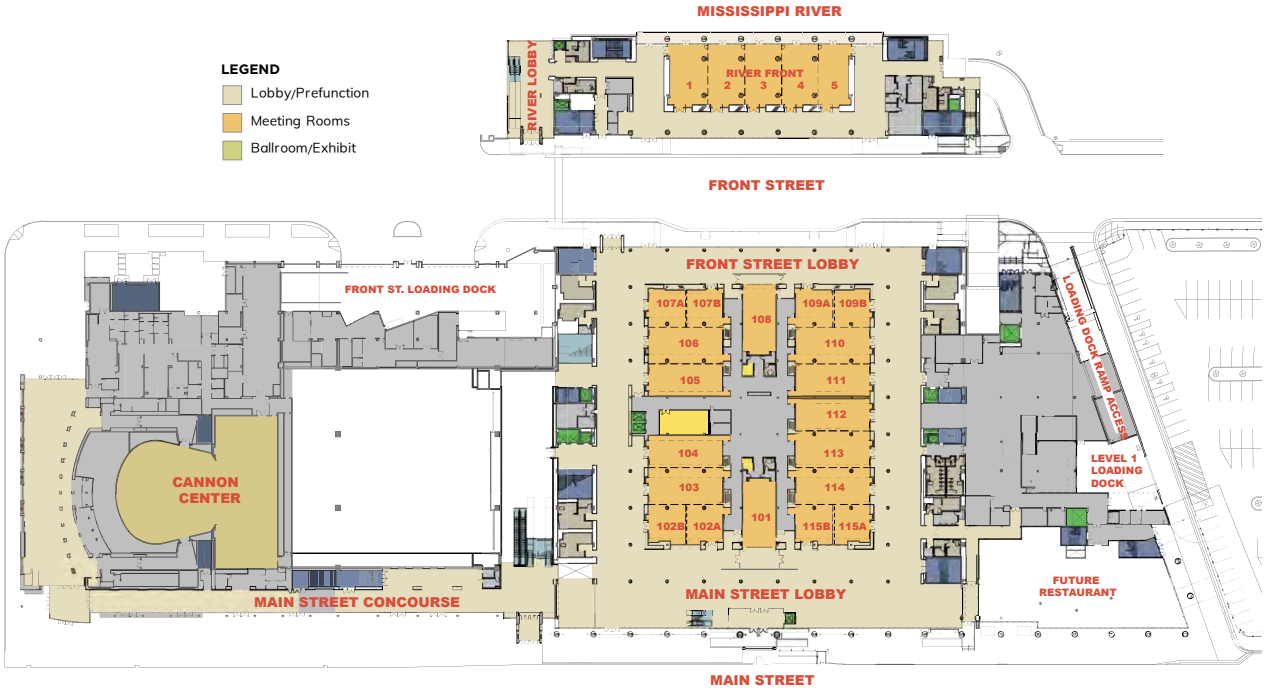
LEVEL 1
SPECIFICATIONS

24 flexible meeting rooms and the spacious Main Street Lobby provide ample breakout and registration space. The Main Street Lobby and Concourse also open to Main Street, just a few steps from our vintage trolley line and directly across from the Sheraton Memphis Downtown. Easy Main Street access to the 2,100 seat Cannon Center for the Performing Arts to accommodate special events and plenary sessions.



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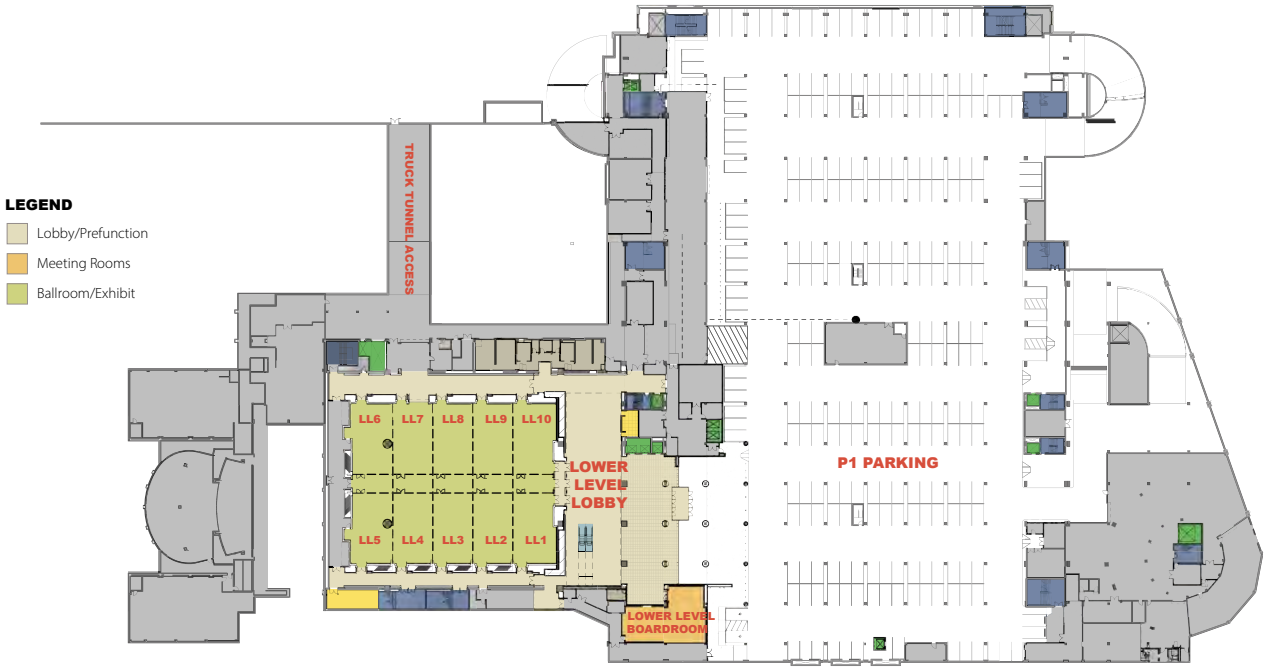
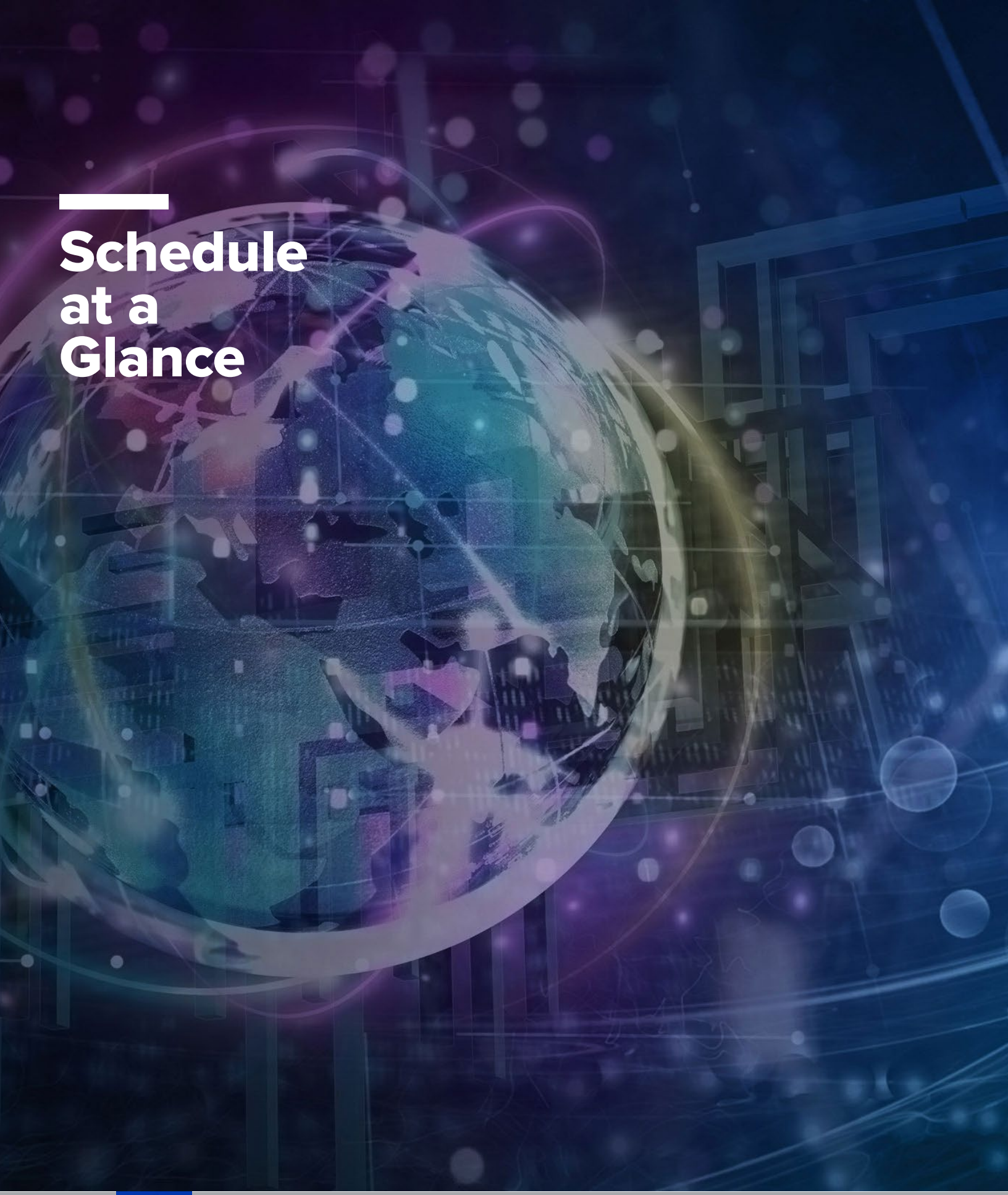
LOWER LEVEL

SPECIFICATIONS

The Lower Level offers a warm welcome with direct access to covered parking. Its 18,000-square-foot Junior Ballroom which can be divided into 10 sizeable breakout rooms, ideal for shows and exhibits as well as meetings and banquets. In addition to a large pre-function lobby and spacious Lower Level Boardroom, this level also features a large truck access tunnel and a special exhibitor storage room.



Please note: All information, including measurements and square footage, is estimated and subject to change throughout the renovation process. Capacities listed are maximized and do not take into consideration stage or production. Renderings and floor plans are courtesy of LRK and tvsdesign.



Schedule at a Glance

SUNDAY NOVEMBER 16	MONDAY NOVEMBER 17	TUESDAY NOVEMBER 18	WEDNESDAY NOVEMBER 19	THURSDAY NOVEMBER 20
Registration - Convention Center 1:00PM–5:00PM	Registration - Convention Center 7:00AM–6:00PM	Registration - Convention Center 7:00AM–6:00PM	Registration - Convention Center 7:00AM–6:00PM	Registration - Convention Center 7:00AM–6:00PM
Committee Meetings and Activities	Continental Breakfast 7:30AM–8:00AM	Continental Breakfast 7:30AM–8:00AM	Continental Breakfast 7:30PM–8:00AM	Continental Breakfast 7:30AM–8:30AM
Professional Development Workshop 1:00AM–2:00AM	Keynote Presentation Tim Lieuwen 8:00AM–9:00AM	Plenary Track Speakers 8:00AM–8:45AM	Special Panel Sessions 8:00AM–9:00AM	Plenary Track Speakers 9:15AM–10:00AM
First-Timers Orientation 2:00PM–3:00PM	Plenary Track Speakers 9:15AM–10:00AM	Refreshment Break 8:45AM–9:05AM	Plenary Track Speakers 9:15AM–10:00AM	Refreshment Break 10:00AM–10:20AM
Future of Mechanical Engineers with ASME 3:00PM–4:00PM	Refreshment Break 10:00AM–10:20AM	Technical Sessions 9:05AM–10:50AM	Refreshment Break 10:00AM–10:20AM	Technical Sessions 10:20AM–12:05PM
IMECE Organizing Committee 4:00PM–5:00PM	Technical Sessions 10:20AM–12:05PM	Refreshment Break 10:50AM–11:10AM	Technical Sessions 10:20AM–12:05PM	Closing Keynote Lunch Chandrakant D. Patel 12:10PM–1:55PM
Council of Chairs Meeting 5:00PM–6:00PM	Exhibit Hall Open 12:00PM–7:00PM	Keynote Presentation Dr. Calvin Mackie Ph.D. 11:10 PM–12:10PM	Exhibit Hall Open 12:00PM–4:30PM	Technical Sessions 2:00PM–3:45PM
	Conference Lunch 12:15PM–1:15PM	Exhibit Hall Open 12:00PM–4:00PM	Conference Lunch 12:15PM–1:15PM	Refreshment Break 3:45PM–4:00PM
	Technical Sessions 1:40PM–3:25PM	Conference Lunch 12:15PM–1:15PM	Agency and Research Posters 12:15PM–2:15PM	Technical Sessions 4:00PM–5:45PM
	Refreshment Break 3:25PM–3:45PM	Rising Stars Showcase 1:15PM–2:45PM	Technical Sessions 2:15PM–4:00PM	Closing Reception 5:45PM–6:45PM
	Technical Sessions 3:45PM–5:30PM	Technical Sessions 2:45PM–4:30PM	Refreshment Break 4:00PM–4:15PM	
	Opening Reception & Undergraduate Expo 5:30PM–7:30PM	Technical Sessions 4:45PM–6:30PM	Technical Sessions 4:15PM–6:00PM	
	Elevate Me Meet-up 7:30PM–9:30PM			

Committee Meetings

IMECE 2025 COMMITTEE MEETINGS & SPECIAL EVENTS @ SHERATON MEMPHIS DOWNTOWN

DAY/DATE	NAME	START	END	ROOM
Saturday, November 15	TCPC Meeting	8:00AM	12:00PM	Heritage IV, 2nd FL.
Saturday, November 15	TCPC-EiC Meeting	12:00PM	4:15PM	Heritage IV, 2nd FL.
Saturday, November 15	ASME TEC Sector Council	8:30AM	5:30PM	"Convention Center Memphis Board Room"
Sunday, November 16	Board of Governors Meeting- CLOSED	9:00AM	12:00AM	"Convention Center LL2 (Lower Level 2)"
Sunday, November 16	ASME TEC Sector Council	8:30AM	5:30PM	"Convention Center Memphis Board Room"
Sunday, November 16	Heat Transfer Division Executive Committee Closed Meeting	1:00PM	2:30PM	Heritage IV, 2nd FL.
Sunday, November 16	Heat Transfer Division Executive Committee Open Meeting	3:00PM	4:30PM	Heritage IV, 2nd FL.
Monday, November 17	L&D Course - ASME BPV Code, Section VIII, Division 1: Pressure Vessel Combo Course (Registration required)	8:30AM	5:00PM	Oxford, 2nd FL.
Monday, November 17	Entrepreneurship in Engineering Workshop	10:30AM	12:00PM	"Convention Center Room LL6"
Monday, November 17	ASME Foundation Board Meeting	11:30AM	2:00PM	Heritage I &II, 2nd FL.
Monday, November 17	Fluids Engineering Division Town Hall	1:00PM	2:00PM	Magnolia Ballroom, 1st FL.
Monday, November 17	Power Conference Committee Meeting	1:00PM	4:00PM	Chattanooga, 2nd FL.
Monday, November 17	AMD/MD Joint Committee on Constitutive Equations Technical Committee Meeting	2:00PM	3:00PM	Jackson, 2nd FL.
Monday, November 17	K-6 Heat Transfer in Energy Systems Committee Meeting	3:00PM	5:00PM	Knoxville, 2nd FL.
Monday, November 17	K-12 Aerospace Heat Transfer Committee Meeting	3:00PM	5:00PM	Beale, 2nd FL.
Monday, November 17	Materials for Biomimetic and Medical Applications Technical Committee Meeting	3:00PM	4:00PM	Jackson, 2nd FL.
Monday, November 17	Fracture and Fatigue Mechanics Technical Committee	4:00PM	5:00PM	Chattanooga, 2nd FL.
Monday, November 17	Composites and Heterogeneous Materials Technical Committee Meeting	4:00PM	5:00PM	Jackson, 2nd FL.
Monday, November 17	ASME Aerospace Division Meeting	7:30PM	8:30PM	Beale, 2nd FL.
Tuesday, November 18	Power Division Executive Committee Meeting	8:00AM	4:00PM	Beale, 2nd FL.

IMECE 2025 COMMITTEE MEETINGS & SPECIAL EVENTS @ SHERATON MEMPHIS DOWNTOWN

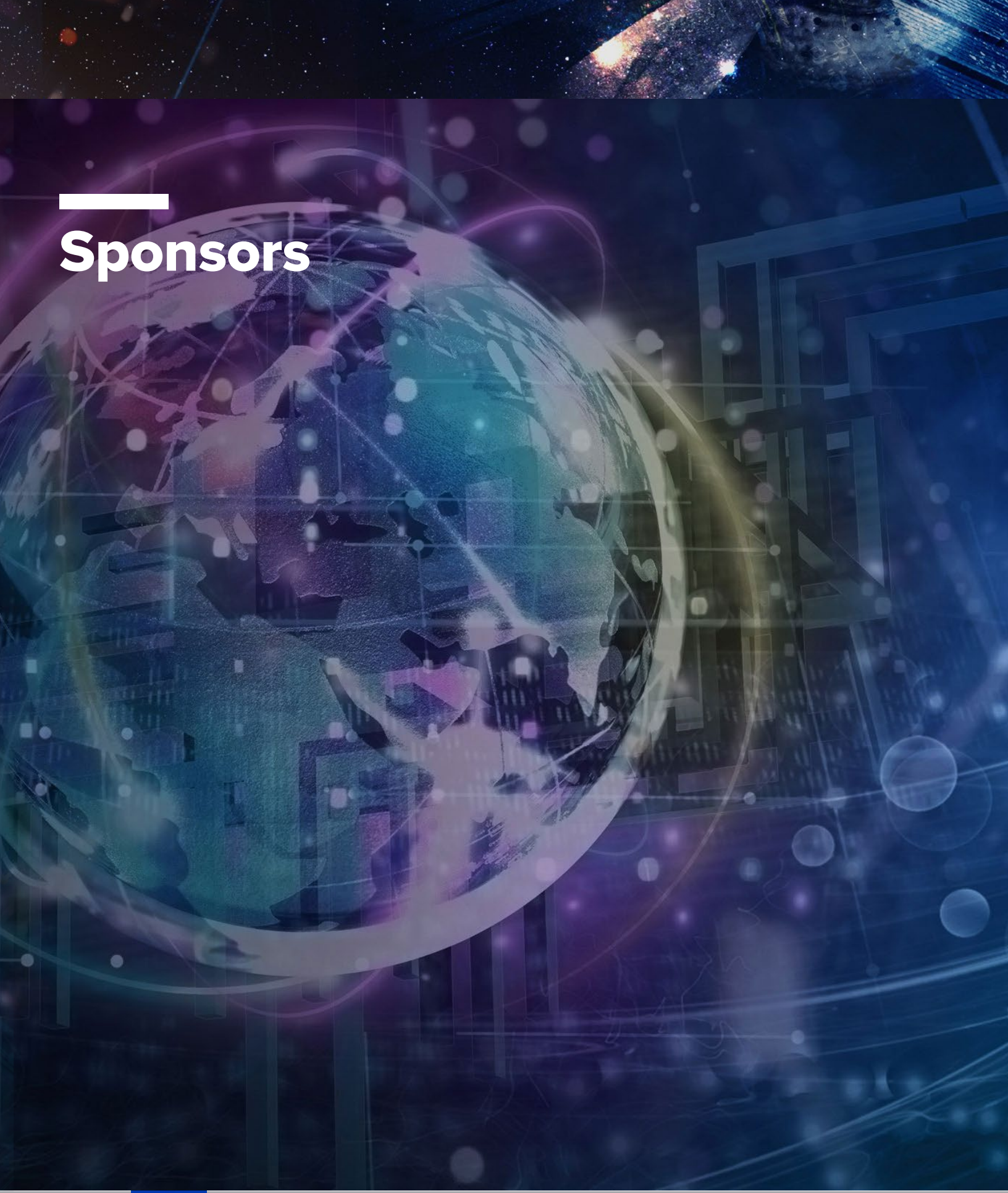
DAY/DATE	NAME	START	END	ROOM
Tuesday, November 18	L&D Course - ASME BPV Code, Section VIII, Division 1: Pressure Vessel Combo Course (Registration required)	8:30AM	5:00PM	Oxford, 2nd FL.
Tuesday, November 18	Bridging the Gap: Critical Research Needs on Solar Thermal Technologies in Evolving Electricity and Industrial Process Heat Markets	9:05AM	10:50AM	Convention Center, Room LL4 (Lower Level 4)
Tuesday, November 18	AMD EC Meeting- CLOSED	9:30AM	5:00PM	Gatlinburg, 2nd FL.
Tuesday, November 18	Technical Committee Meeting for Experimental Mechanics	2:00PM	3:00PM	Azalea, 1st FL.
Tuesday, November 18	Technical Committee Meeting for Mechanics of Soft Materials	3:00PM	4:00PM	Azalea, 1st FL.
Tuesday, November 18	Mechanical Engineering Department Heads Executive Committee (MEDHEC) Meeting	4:30PM	5:30PM	Heritage I, 2nd FL.
Tuesday, November 18	Warner T. Koiter Medal Lecture	5:00PM	6:00PM	Convention Center, Room LL7 (Lower Level 7)
Tuesday, November 18	Fluid Measurements and Instrumentation Technical Committee	5:00PM	6:00PM	Heritage IV, 2nd FL.
Tuesday, November 18	Technical Committee Meeting for Computing in Applied Mechanics (CONCAM)	5:00PM	6:00PM	Azalea, 1st FL.
Tuesday, November 18	Advanced Materials for Energy Technical Committee Meeting	5:00PM	6:00PM	Gatlinburg, 2nd FL.
Tuesday, November 18	NanoTG Annual Meeting	5:00PM	6:00PM	Memphis, 2nd FL.
Tuesday, November 18	Power Division Renewable Energy Committee Meeting	5:00PM	6:00PM	Jackson, 2nd FL.
Tuesday, November 18	Advanced Energy Systems Division Lecture & Reception	5:00PM	7:00PM	Heritage II, 2nd FL.
Tuesday, November 18	Technical Committee on Dynamics and Control of Systems and Structures	5:30PM	6:30PM	Chattanooga, 2nd FL.
Tuesday, November 18	Advancement in Industry Reception	5:45PM	7:15PM	Magnolia Ballroom, 1st FL.
Tuesday, November 18	ME Department Heads Reception	6:00PM	7:30PM	Heritage I, 2nd FL.
Tuesday, November 18	K-8 Theory and Fundamental Research Committee Meeting	6:00PM	8:00PM	Heritage IV, 2nd FL.
Tuesday, November 18	K-9 Nanoscale Thermal Transport Committee Meeting	6:00PM	8:00PM	Memphis, 2nd FL.

IMECE 2025 COMMITTEE MEETINGS & SPECIAL EVENTS @ HYATT REGENCY PORTLAND

DAY/DATE	NAME	START	END	ROOM
Tuesday, November 18	K-15 Transport Phenomena in Manufacturing and Materials Processing Committee Meeting	6:00PM	8:00PM	Azalea, 1st FL.
Tuesday, November 18	Editorial Board - *ASME J of Engineering and Science in Medical Diagnostics and Therapy*	6:00PM	7:00PM	Knoxville, 2nd FL.
Tuesday, November 18	K-20 Computational Heat Transfer Committee Meeting	6:00PM	8:00PM	Jackson, 2nd FL.
Tuesday, November 18	Materials Processing Technical Committee Meeting	6:00PM	7:00PM	Beale, 2nd FL.
Tuesday, November 18	Applied Mechanics Division Awards Dinner	6:30PM	9:00PM	Nashville, 2nd FL.
Tuesday, November 18	ASME MEMS Division Meeting	6:30PM	8:30PM	Heritage III, 2nd FL.
Tuesday, November 18	Electronic Materials Technical Committee Meeting	7:00PM	8:00PM	Gatlinburg, 2nd FL.
Tuesday, November 18	Advanced Energy Systems Division Advanced Energy Systems Analysis Technical Committee Meeting	7:00PM	8:00PM	Beale, 2nd FL.
Tuesday, November 18	Advanced Energy Systems Division Electrochemical Energy Conversion & Storage Technical Committee Meeting	7:00PM	8:00PM	Knoxville, 2nd FL.
Tuesday, November 18	Advanced Energy Systems Division Renewable Energy & Energy Conversion Technical Committee Meeting	7:00PM	8:00PM	Chattanooga, 2nd FL.
Tuesday, November 18	Fluid Mechanics Technical Committee	8:00PM	9:00PM	Heritage IV, 2nd FL.
Wednesday, November 19	L&D Course - ASME BPV Code, Section VIII, Division 1: Pressure Vessel Combo Course (Registration required)	8:30AM	5:00PM	Oxford, 2nd FL.
Wednesday, November 19	Advanced Energy Systems Division Executive Committee Meeting	12:00PM	2:00PM	Nashville, 2nd FL.
Wednesday, November 19	Micro and Nano Fluid Dynamics Technical Committee	4:00PM	5:00PM	Nashville, 2nd FL.
Wednesday, November 19	Computational Fluid Dynamics Technical Committee	4:30PM	5:30PM	Heritage IV, 2nd FL.
Wednesday, November 19	Multiphase Flow Technical Committee	5:00PM	6:00PM	Nashville, 2nd FL.
Wednesday, November 19	Materials Division Reception	5:00PM	7:00PM	Heritage I, 2nd FL.
Wednesday, November 19	Women in Engineering Discussion and Reception	5:00PM	6:30PM	Magnolia Ballroom, 1st FL.

IMECE 2025 COMMITTEE MEETINGS & SPECIAL EVENTS @ HYATT REGENCY PORTLAND

DAY/DATE	NAME	START	END	ROOM
Wednesday, November 19	Fluid Applications & Systems Technical Committee	5:30PM	6:30PM	Heritage IV, 2nd FL.
Wednesday, November 19	Design of Engineering Materials Technical Committee Meeting	6:00PM	7:00PM	Knoxville, 2nd FL.
Wednesday, November 19	NCAD Executive Committee Meeting	6:00PM	7:30PM	Azelea, 1st FL.
Wednesday, November 19	Power Division Awards Banquet	6:30PM	8:00PM	Heritage II, 2nd FL.
Wednesday, November 19	Biomedical and Biotechnology Track Organizers	6:00PM	7:00PM	Nashville, 2nd FL.
Wednesday, November 19	Fluids Engineering Division Reception	6:30PM	9:00PM	Heritage IV, 2nd FL.
Wednesday, November 19	Multifunctional Materials Technical Committee Meeting	7:00PM	8:00PM	Knoxville, 2nd FL.
Wednesday, November 19	Additive Manufacturing Benchmark Series Award Ceremony and Dinner	7:00PM	9:30PM	Heritage III, 2nd FL.
Wednesday, November 19	Track 3: Advanced Manufacturing Closing Session	7:30PM	9:00PM	Nashville, 2nd FL.
Thursday, November 20	L&D Course - ASME BPV Code, Section VIII, Division 1: Pressure Vessel Combo Course (Registration required)	8:30AM	5:00PM	Oxford, 2nd FL.
Thursday, November 20	Materials Division Technical Committee and Executive Committee Joint Meeting	10:00AM	12:00PM	Knoxville, 2nd FL.
Thursday, November 20	Power Division Steam Turbine Generators & Auxiliaries (STG&A) Technical Comm Meeting	10:30AM	12:00PM	Chattanooga, 2nd FL.
Thursday, November 20	Fluid Engineering Division Executive Committee and Technical Chair Meeting CLOSED	11:00AM	1:00PM	Jackson, 2nd FL.
Thursday, November 20	IMECE 2025 Closing Reception	5:30PM	6:30PM	Magnolia Ballroom, 1st FL.



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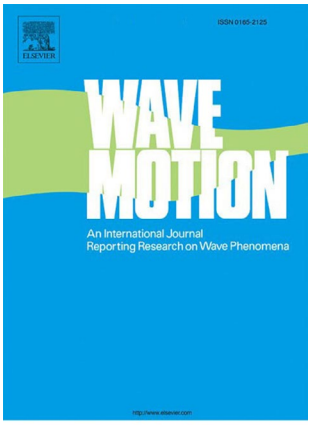

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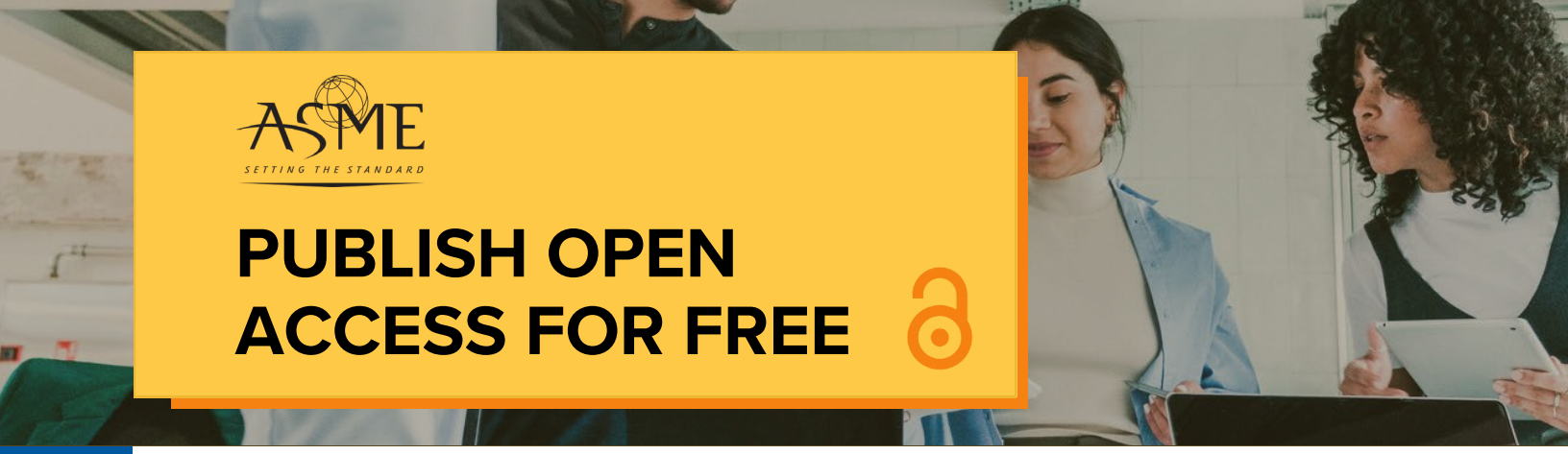

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